

relevant results and theoretical developments
of science and research

8

2018
issue 1

AD ALTA

Journal of Interdisciplinary Research

AD ALTA: Journal of Interdisciplinary Research

Double-Blind Peer-Reviewed

Volume 8, Issue 1, 2018

Number of issues per year: 2

MAGNANIMITAS Assn.

AD ALTA: JOURNAL OF INTERDISCIPLINARY RESEARCH

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ISSN 1804-7890, ISSN 2464-6733 (ONLINE)

AD ALTA IS A PEER-REVIEWED JOURNAL OF INTERNATIONAL SCOPE.

2 ISSUES PER VOLUME.

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A SOCIAL SCIENCES

AA	PHILOSOPHY AND RELIGION
AB	HISTORY
AC	ARCHAEOLOGY, ANTHROPOLOGY, ETHNOLOGY
AD	POLITICAL SCIENCES
AE	MANAGEMENT, ADMINISTRATION AND CLERICAL WORK
AF	DOCUMENTATION, LIBRARIANSHIP, WORK WITH INFORMATION
AG	LEGAL SCIENCES
AH	ECONOMICS
AI	LINGUISTICS
AJ	LITERATURE, MASS MEDIA, AUDIO-VISUAL ACTIVITIES
AK	SPORT AND LEISURE TIME ACTIVITIES
AL	ART, ARCHITECTURE, CULTURAL HERITAGE
AM	PEDAGOGY AND EDUCATION
AN	PSYCHOLOGY
AO	SOCIOLOGY, DEMOGRAPHY
AP	MUNICIPAL, REGIONAL AND TRANSPORTATION PLANNING
AQ	SAFETY AND HEALTH PROTECTION, SAFETY IN OPERATING MACHINERY

DETERMINANTS OF THE WRITING PROCESS IN ELEMENTARY SCHOOL PUPILS

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This article was drawn up within the project of the Grant Fund of the Dean of the Faculty of Education, Palacký University, named Autoregulation of learning during production of text carried out by pupils of the upper elementary school.

Abstract: The presented study presents an elementary theoretical basis of research activities aimed at observation of the relation between pupils' metacognition and the level of their productive text competence. In the presented study we characterize the individual components of metacognition in relation to writing, i.e. we define the individual indicators of self-regulation of learning (self-efficacy, monitoring and self-regulation, strategic thinking, self-assessment). In the second part of the text we describe a possible way of diagnosing and observing pupils, whereas at the same time we expect a positive influence on the writing process itself.

Keywords: writing, self-regulation, self-efficacy, self-assessment, upper elementary school pupil.

1 Introduction

Writing a text is perceived as a problematic learning task. When developing the skill to produce texts, on the one hand pupils acquire text competence, on the other hand the development of (especially strategic) thinking can be significantly influenced. As to strategic thinking, pupils are active learners, think about alternative solutions and potential obstacles, consider risks, structure their individual steps according to a certain time dimension and work attentively with the aim to achieve the best results. If the chosen strategy is wrong or incomplete, deficiencies will be reflected in the quality of the text. At the same time, these deficiencies signalize problematic self-regulation.

The level of pupil's final text is influenced by many factors. On the basis of previously implemented research investigations (Kusá, 2016), we defined the initial aspects of diagnosing metacognitive functions of pupils that are active during the writing process. At the same time, we set an assumption of a direct influence of the metacognition level on the quality of the text. On this basis, we identified a need for further research surveys focused on individualization of the entire research process. Therefore, we focus on continuous observation of the individual pupils and their text production, diagnostics and assessment. The learning process itself will be individualized in the end. The planned experiment will provide the teacher with valuable information concerning the individual pupils and their progress when acquiring their writing skills. This leads to a significantly more targeted intervention in pupils who encounter writing problems.

We assume that various factors play a key role in the writing process. They are indicators of the level of acquiring text competence and the level of metacognitive knowledge and skills: 1. Perceived academic efficacy, relation to the learning role; 2. Level of metacognitive (self-regulation) skills - planning and monitoring; 3. Self-assessment skills. The aim of the following text is to formulate the theoretical basis and to indicate possible approaches to observation of the relation between the above-mentioned factors and the level of productive text competence.

2 Metacognitive knowledge and self-efficacy

According to Hrbáčková (2011), not only cognitive determinants but also affective, i.e. personal relation to learning, and metacognitive, i.e. knowledge and self-management in the process of learning, determinants play an important role in the writing process.

Metacognitive knowledge is individual's knowledge of the strengths and weaknesses of his / her own cognition (Řičan,

2016). Traditionally, metacognitive knowledge includes individual's self-knowledge, knowledge about the task and knowledge about the strategies necessary for him / her to solve the task, and subsequently its controlled application, i.e. the so-called metastrategic knowledge (Řičan, 2016; comp. Flavell, 1979).

An important factor that influences the writing process is the so-called perceived academic efficacy which is part of the metacognitive knowledge (Otani, Widner, 2005). Self-efficacy is a certain self-reflection in relation to the learning task (the level of knowledge about the learning task plays an important role - its value as well as the knowledge of the solution strategies), i.e. believing in one's own abilities (comp. Harris, 2009). With reference to various researches, we can assume a direct connection between perceived self-efficacy and the course and results of learning; if the pupil perceives himself / herself as capable, this fact will be reflected positively in his / her motivation and by his / her choice of the strategy to solve the given learning task (Bandura, 1994). Therefore, we assume that pupils showing a higher level of self-efficacy (pupils who are focused on mastering the learning task and perceive themselves as a factor that affects the course of activity and whether or not the goal is achieved) will show higher performance and efficacy throughout the entire writing process. When such a pupil is exposed to a difficult learning task, he / she perceives it as a challenge, does not give up when things get complicated, does not feel anxiety but, in line with strategic thinking, looks for an alternative solution (Fisher, 2011). Many professionals demonstrate this relation (Bandura, 1994; Pajares, 2003; Schunk, 2010, etc.), i.e. pupils who do not perceive themselves as authors of good texts do not like writing or approach writing differently compared to those with a higher level of self-efficacy (they cannot plan the solution strategy properly, they concentrate poorly, they are anxious when complications occur, feel helpless and often give up their activity, unable to work with time efficiently, avoiding difficult tasks, etc.). They often produce too short or incomplete texts. On the other hand, texts written by pupils with a higher level of self-efficacy are more extensive and their quality is generally better.

Observation of self-efficacy in individual pupils will bring valuable insight into their relation to themselves, the learning task and the expected pupil's approach to the whole writing process. Self-knowledge is one of the main prerequisites for internal motivation and effective self-regulation of learning activities.

3 Metacognitive skills

Strengthening the algorithm of the writing process and internalizing the way of thinking is supported by the conscious control of individual's own cognitive activities, i.e. self-regulation of learning. It consists in the assumption of a self-command language that is related to the so-called silent knowledge - the pupil can recognize what will help him / her to achieve goals, and he / she achieves them (Málková, 2009, Sternberg, 2001). An individual who has assumed metacognitive skills can accurately identify the goal, independently thinks about the procedures that will help him / her to achieve the goal, chooses, evaluates and changes strategies, i.e. he / she engages in an internal dialogue with himself / herself, follows his / her own thinking with the aim to achieve the goal.

Metacognitive skills (referred to as self-regulated learning skills by some authors, e.g. Foltýnová, 2009) which are part of metacognition, consist in planning of cognitive processes, their regulation and evaluation (Cao and Nietfeld, 2007; Krykorková and Chvál, 2001; Veenman et al., 2006, etc.). During planning an individual formulates and analyzes a goal in relation to his / her self-efficacy and his / her own relation to learning tasks of the given type and his / her possibilities. Consequently, he / she chooses the way how to process the learning task, thinks of the

solution algorithm and the appropriate strategies. He / she tries to anticipate obstacles that could complicate the task and thinks in advance about how to implement a change in the solution strategy. The learning task is also being structured. The pupil generates individual activities through which the goal will be achieved and which must be performed in a certain time sequence, i.e. he / she plans a time schedule. We assume that a consistent approach to the monitoring process has a positive effect on achievement of goals (comp. Hacker et al., 2009). Self-regulation itself is a metacognitive control - self-monitoring and self-management. The individual deliberately follows steps through which the task is solved. He / she revises the selected procedures and chooses a different way of solving in case of difficulties, he / she uses the so-called conditional knowledge, i.e. he / she "is capable of choosing adequately and adaptively, depending on the situation, and thus responding to a variable situation by choosing a suitable strategy and adapting to the new conditions" (Řičan, 2016, p. 39). Metacognitive skills also include the ability of self-assessment. This ability has a major impact on transfer of acquired skills, i.e. their use in the future, for teaching tasks of a similar type as well as in situations requiring a similar way of thinking. The pupil continuously and finally evaluates the chosen procedures, especially their effectiveness and importance. After completing the task, he / she discovers critical parts, considers potential changes in the procedures when repeating the task, evaluates the benefit of the task to himself / herself, and so on.

4 Research design proposal

In order to develop text competence, pupil's thinking and his / her metacognition and ability to self-regulate using an appropriate and targeted didactic intervention, it is primarily necessary to capture and describe in detail the possible relation between the observed phenomena and to identify the key factors and possible deficiency areas.

The research survey is focused on working with individuals. We assume implementation of a qualitative research survey which will allow observation of the individual pupils of the experimental group (fifteen pupils) and a detailed analysis of their texts, and in particular a description of the influence of the monitored factors on the form of pupils' texts. To be more specific: the selected group of pupils will be observed as to the influence of self-efficacy and their relation to the learning task on the course of the writing process. Furthermore, the level of metacognitive (self-regulation) skills and their influence on the quality of the text will be examined.

Experimental activity also encourages pupils to work more effectively. Pupils' thinking deliberately slows down. We can assume an increased motivation and interest in the task itself, the solution algorithm is becoming more accurate and consolidated, pupils follow the flow of their ideas and so they become more metacognitive (Cibáková, 2015). We agree with Hrbáčková's opinion (2011) indicating that supporting pupils' self-regulation generally shapes their positive relation to learning and lifelong learning (comp. Řičan, 2016); pupils who regulate their own learning are gradually assuming ways of self-regulation in other areas of life.

The aim of the first phase of the research survey is to capture the influence of the level of self-efficacy in relation to writing on the course of the entire process and its result (i.e. on the quality of the final text). To this end, we primarily plan to use the General Self-Efficacy Scale (GSE) to assess the degree of pupils' optimistic self-esteem and the extent of their belief in their own responsibilities in relation to learning tasks and the perceived ability to manage problems. Pupils will fill in the following ten-item scale (Schwarzer, R., & Jerusalem, M, 1995):

General Self-Efficacy Scale (GSE)	Scoring
1. I can always manage to solve difficult problems if I try hard enough.	
2. If someone opposes me, I can find the means and ways to get what I want.	
3. It is easy for me to stick to my aims and accomplish my goals.	
4. I am confident that I could deal efficiently with unexpected events.	
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.	
6. I can solve most problems if I invest the necessary effort.	
7. I can remain calm when facing difficulties because I can rely on my coping abilities.	
8. When I am confronted with a problem, I can usually find several solutions.	
9. If I am in trouble, I can usually think of a solution.	
10. I can usually handle whatever comes my way.	

Scoring	Not at all true	Hardly true	Moderately true	Exactly true
	1	2	3	4

The total score is calculated by finding the sum of the all items. For the GSE, the total score ranges between 10 and 40, with a higher score indicating more self-efficacy.

In order to identify the relation of pupils' self-efficacy in relation to writing, we have created a modified version of the GSE scale. This one is more specific, i.e. relates directly to the problematic task of writing (i.e. it combines two constructs of metacognitive knowledge - the relation to himself / herself and to the learning task). Comparison of the results of both scales will allow us to determine the degree of self-efficacy in relation to the particular problematic task. It is to be assumed that an experimental group may include pupils who generally show a higher degree of self-efficacy, however, it diminishes when the learning task is specified (i.e. pupils do not consider themselves to be good authors of texts but in different learning situations they believe in themselves) and vice versa (generally, pupils do not believe in themselves very much but they consider writing to be their domain). Comparing scores 1 and 2 will allow us to detect such cases.

The modified scale contains the following formulations:

Modified version of the Self-Efficacy Scale	Scoring
1. I can always manage to write a difficult essay if I try hard enough when writing.	
2. If something complicates my writing, I can find ways to overcome the obstacle and continue.	
3. It is easy for me to write a good text.	
4. I know how to write a good text thanks to my experience, possibilities and knowledge.	
5. I believe in myself. I know that I can handle any unforeseen situations or complications I experience when writing a text.	
6. I can write almost anything if I invest the necessary effort.	
7. I can remain calm when facing difficulties during writing because I can fully rely on my coping abilities.	
8. When I am confronted with a problem during writing, I can usually find several solutions how to cope with it.	
9. If I am in trouble (I do not know how to continue, I need to change a part of the text, etc.), I can usually think of a solution.	
10. I can usually handle whatever comes my way during writing.	

The second phase of the research survey will focus on observation of the level of metacognitive skills of pupils (i.e. planning and self-regulation). For this purpose, pupils will draw up a check-list (chart) before they start writing the text through which they will plan all steps that will make them achieve the goal (i.e. to write a text on a particular subject). When processing the check-lists, pupils will be allowed to proceed in any way (structured text, drawings, pictures, etc.). They will also work with the check-list during and after writing; they will put a comment to each check-list item. These comments will include information on the progress of the item, possible complications that may occur and their solutions.

The research data will allow us to observe how pupils perceive the respective learning task, whether they perceive all items of the knowledge domain (i.e. education areas, teaching tasks - in this case all three stages of writing: prewriting, writing, postwriting) or whether they show certain deficiencies in this respect which will subsequently appear / not appear in their texts. All components of the knowledge dimension will be observed according to the revised Bloom's taxonomy (i.e. knowledge of facts, concepts, process and metacognitive knowledge - see Kusá, 2016, p. 27).

The third research phase will be focused on self-reflection and self-assessment which are important parts of metacognition. In order to capture the self-assessment process of pupils, we will use the method of unfinished sentences. Pupils will complete the following formulations:

1. *I have managed...*
2. *I need to improve ...*
3. *Mainly ... facilitated my work.*
4. *... made my work more complicated.*
5. *... proved to be good.*
6. *Next time I would act differently when
..... because
.....*
7. *I have learned...*
8. *I enjoyed...*
9. *I did not like...*
10. *I will surely use...*
11. *I do not think I will use ...*

The unfinished sentences are formulated to develop pupils' self-reflection ability. They encourage them to perceive themselves as a factor that influences the course of learning. In relation to the given learning task and the activities that led to its completion, pupils look to the past (see questions 1, 2, 3, 4, 5, 7, 8, 9) but also to the future as they think of the learning task itself and the transfer possibilities (see questions 6, 10, 11). This research phase also has an educational value as pupils are encouraged to use metacognition.

All the data will be subject to a qualitative content analysis using encoding. Each pupil will be assessed individually. The results of the individual research phases will be interpreted in relation to the final texts of the respective pupils. They will be assessed on the basis of the following criteria: 1. Content, topic; 2. Communication intention; 3. Use of language; 4. Text composition, structure and coherence; 5. Intellectual value, level of argumentation; 6. Creativity, originality.

5 Conclusion

The presented study brings the theoretical basis for the planned research survey which is part of the project named *Autoregulation of learning during production of text carried out by pupils of the upper elementary school*. The aim of the research survey is to observe the level of metacognition in pupils in relation to the writing process. We focus on metacognitive knowledge, i.e. self-knowledge in relation to the given learning task, which is directly related to the level of self-efficacy. At the same time, our aim is also to observe the metacognitive skills

used by pupils during the writing process. They include activity planning, self-regulation and the level of self-reflection and self-assessment. For the purpose of the research, it was necessary to determine the relevant theoretical basis, i.e. to clearly define mainly the following theoretical constructs: metacognitive knowledge, self-efficacy, metacognition, metacognitive skills - planning, observation, self-reflection and self-assessment. At the same time, we are also presenting the research design. The research survey consists of three phases and uses such methods that allow insight into the writing process of individual pupils, including observation of non-cognitive, psychological factors. The aim of the text is to draw attention to the connections between the level of the metacognition and the level of pupils' success in the field of writing. At the same time, we point out the need for an innovative approach to assessment of pupils; a teacher using the aforementioned experimental methods can detect the causes of failure of his / her pupils more easily and, therefore, respond in the form of appropriate pedagogical intervention.

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Primary Paper Section: A

Secondary Paper Section: AM

THE INFLUENCE OF VALUE-ADDED TAX CHANGES ON THE HOUSEHOLD CONSUMPTION

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This research was supported by VEGA project No. 1/0311/17 on Measuring and Reporting Intangible Assets.

Abstract: Value-added tax (VAT) is still relatively new financial instrument of generating government revenues that has become more popular in recent years. The main problem of recent VAT is that it has got an ineffective adjustment. This article solves the problem of VAT impact on household consumption in the Member States of the European Union (EU). To analyze the relationship between change in VAT rate and selected macroeconomic indicators, there was used the regression analysis and the cluster analysis. We applied our research to EU Member States for a period of year 2016. Based on our tested hypotheses, we can conclude that the most significant factor influencing the household consumption is not VAT, but the unemployment rate.

Keywords: Standard tax rate, value added tax, macroeconomic factors, household consumption, cluster analysis.

1 Introduction

Value-added tax (VAT) is still relatively new but important financial source of government revenues in the Member States of the European Union (EU). From the first establishing of VAT in France it passed almost 50 years. Nowadays VAT represents the main financial instrument of generating government revenues in more than 150 world's countries. When the government sets tax rate in a country, it should take into account that there should not be an excessive tax burden on household consumption, and as well as to maintain enough cash flow to state budget to cover government expenditures. In the EU countries, VAT is regulated since the 1st of January 2007 by Directive No. 2006/112/EC on the common system of value-added tax. This directive contents law rules and legislation on the common system of VAT in the EU, and it replaced the sixth VAT Directive No. 77/388/EEC on harmonization of the laws of the Member States relating to turnover taxes. The Member States apply a standard VAT rate which level is determined by each country as a percentage of the tax base, and which is the same for supplying goods, as well as for providing services. Directive No. 2006/112/EC does not set the one harmonized VAT rate, but sets only a framework for determining rate for the Member States. It means that each individual European government can set their own VAT, and the level of VAT rate independently. However, the Member States have to comply with two basic rules relating to a standard VAT rate and reduced VAT rate. The standard VAT rate for not exempted goods and services has to apply every Member State, and it must be no less than 15%, while there is no maximum level of standard VAT rate. The second rule adjusts one or two reduced rates for goods and services, but no less than 5%. Also, the Directive offers an opportunity to apply "special rate of VAT", zero VAT rates and other particular VAT rates. To many EU countries, it should be allowed to derogate from these conversion rules, following the aim of harmonization of law legislation with EU Directive of the VAT.

2 Literature

However, the value-added tax is the most frequent tax used in many countries, it also is relatively new tax instrument through which the government revenues can be significantly increase. The main benefit of VAT is that it is a taxation of consumption. It means that tax payers consider VAT as a natural content of price of goods and services. As Paulíčková (2002) states, VAT is from economic origin a general excise tax, which burden a final consumer, but which pays a supplier. With VAT it is taxed public as well as private consumption, and so the own consumption of entrepreneur. (Alm, El-Ganainy, 2013) analyzed an impact of VAT on consumption in 15 European countries in period of 1961-2005, and they concluded that an increase in VAT rate by 1% leads to a reduction of total consumption approximately by 1%. That means that a correlation between

VAT and consumption is negative. So, when considering a change in VAT rate, it is necessary to take into account an influence of VAT on consumption. An increment in VAT rate in a country is often connected with a public interest and sometime it becomes an important factor during the pre-election period. Many people believe that an augmentation of VAT will have a negative effect on the aggregate consumption, and finally the economic growth will be weakening. Similarly, a reduction in VAT rate during the economic recession is sometime a reason for strengthening the economic growth through stimulating the aggregate consumption (Miki, 2011). When we monitor a reduced VAT rate, in many EU countries reduced VAT has got small tax base because it is taxed only a part of the total consumption because of earlier mentioned "special rates of VAT". Special rates are usually applied on foodstuff, health care, education, financial services, housing, public transport and so like (Carroll et al., 2010). Households with a higher percentage of consumption for goods and services with reduced VAT rate, will gain from reduced rate more than other households. This is the main reason, which is argued as an advantage of reduced VAT rates on foodstuff. It is supposed that poorer households have higher percentage of expenditures on foodstuff than richer households. This redistribution effect is more significant if a reduction in VAT rates is associated with augmentation of tax rate on those goods, which have higher percentage of expenditures on consumption of richer households (Economics, 2008). One of the main grounds of establishing the reduced VAT rate on labor-intensive services is lower advantage of the domestic production. The domestic production of services represents an economic loss for a country because there are not used benefits of specialization (Frederiksen et al., 1995). Crossley et al. (2009) draw an attention to forward announced government intention to compensation of reduced VAT rates for higher VAT rate in the future. According to these authors, this compensation has a huge influence on consumers' decisions when they consider their future consumption. It could have led to higher substitution effect because a change in VAT rate in the future will enlarge a size of present relative prices and future relative prices. Attanasio and Weber (2010) claim that if there are occurred unexpected changes in consumers' incomes, then should happen a significant change in consumption. Browning and Crossley (2009), Carroll et al. (2010) examined how consumers react on purchasing long-term consumption goods after changes in tax rates. Changes in tax rates cause changes in consumption between economic seasons because consumers react on higher prices in the future by accelerating their consumption in the current season. Also Miki (2011) states that if an augmentation of VAT rate is forward announced, then people will buy those products by which they can be supplied before tax rate has risen. Anticipating the future increment in VAT rate should raise the demand for particular goods. Also, it is possible that in the future consumers will postpone their consumption on those goods which tax rate will be reduced. A scale of both effects is various in every economic sector because of a dependence on income and price elasticity of demand, as well as on cross-price elasticity of demand (Economics, 2008). Sargent (1978), Hall (1978), Flavin (1981), Hayashi (1982) supposed hypothesis of permanent income. Their claims were based on presumption that consumption and disposable income are generated through a two-dimensional autoregressive process. Based on rational expectations of permanent income, changes in income should not affect private savings or private consumption because these changes are already included in the past consumption decisions. Consumption was based on rational expectations of the permanent income. Hayashi (1982) pointed out that consumption is more sensitive to current incomes. This approach was engaged attention by the existence of liquidity constraints. Deaton (1981) claimed that consumption is high sensitive to anticipated changes in rates, and a difference between anticipated and unforeseen changes is not important. Peter et al. (2006) supposed that consumption does not react on temporary but on permanent changes in incomes. The Member States differ from each other not only by the maturity of the

economy, the tax system, the sectoral specialization but also by the size of population or by percentage of the unemployment to the working population. Therefore, it is necessary to monitor the changes of these specifics on household consumption.

3 Data and methodology

The aim of this article is to evaluate an impact of value-added tax and an impact of selected macroeconomic indicators on final consumption of household. The article was divided into two parts: the first part measured the impact of VAT and selected macroeconomic indicators on the household consumption using the linear regression model. The assessment of this impact was carried out for each the Member State separately. We set the hypothesis as:

- Hypothesis I: "Is VAT the main and decisive factor that affects the household consumption?"

In the second part of this article, there was made economically transparent categorization of EU countries with regard to predetermined criteria using the Ward's hierarchical clustering method. Testing this analysis, we set two hypotheses:

- Hypothesis II: "Are the Member States divided into the new and old States?", and
- Hypothesis III: "Economically advanced countries, or indebted countries respectively, can create a common cluster".

The data was common to both analysis and was structured on annual basis from Eurostat (2016) database, as well as from Index Mundi (2016) database for EU28 Member States. The reference period was the year 2016.

The selection of variables was conditional to the theoretical aspects of authors (Akhmetova, 2013, Álvarez-Martínez et al., 2014, Alm et al., 2013, Batina, 1999, Lewis et al., 1998) which examined the influence of VAT and other macroeconomic indicators on household consumption and on final consumer in the EU using regression models. For the categorization of the countries under the cluster analysis was used the Ward's hierarchical linkage method, using `hclust()` function¹ (Ferreira, et al., 2009). The analysis was made in the statistical programme R with using statistical packages `psych`, `GPA` rotation, `nFactors`, `cluster` a `NbClust`. There were carried out the normality test of residuals, the heteroscedasticity test, and detected autocorrelation and multicollinearity that ensured a correct measurement of results. Our model tested input independent variables, which affect most often expenditures on the current consumption in a country as a dependent variable.

In the model, we have taken into account the following input variables:

- Expenditures on the total household consumption – are so called "delayed values", what means that in the calculation of expenditures for the total household consumption in a country i and in the time t , we count values in real prices per capita to the base year 2010. We suppose that the delayed values in the time $t-1$ will have a positive effect on expenditures growth on the total household consumption in time t .
- The effective VAT – a ratio between VAT revenues expressed in real prices, and expenditures for the total household consumption expressed in real prices.

$$\text{Effective VAT}_{i,t} = \frac{R_{\text{from VAT}_{i,t} \text{ per capita}}}{E_{i,t} \text{ for household C}} * 100,$$

where: R – Revenues from VAT;
E – Expenditures for household consumption;
C – Consumption.

- Income tax – is adjusted for inflation rate, and so expressed in real prices for the base period of year 2010.
- Nominal GDP per capita – values calculated per one inhabitant in a country, expressing the economic performance.
- Unemployment rate – expression in relative, not absolute values.
- Total population – all persons with permanent address in certain area of a country, without considering legal status or state nationality.
- Inflation rate – an annual percentage change in consumer prices.
- Disposable income of household – an annual gross disposable income determined to households.
- Random error – an error of the regression model which represents a difference between real values and predicted values. This error can be either positive, or negative.

Based on variables stated above, we set the following econometric model:

$$CC_{i,t} = 1 + PC_{i,t-1} + \beta_1 VAT_{i,t} + \beta_2 IT_{i,t} + \beta_3 GDP_{i,t} + \beta_4 UR_{i,t} + \beta_5 TP_{i,t} + \beta_6 IR_{i,t} + \beta_7 I_{i,t} + \mu_{i,t}$$

where: $CC_{i,t}$ – Current consumption; a dependent variable,

$PC_{i,t-1}$ – Past consumption; an independent variable,

$X_{i,t}$ - Vector of observed independent variables,

$\beta_{i,t}$ - Parameter vector,

$VAT_{i,t}$ - Value-added tax,

$IT_{i,t}$ - Income tax,

$GDP_{i,t}$ - Gross domestic product,

$UR_{i,t}$ - Unemployment rate,

$TP_{i,t}$ - Total population,

$IR_{i,t}$ - Inflation rate,

$I_{i,t}$ - Income (disposable),

1 - Constant value,

i - Certain country,

t - Year in which the value is given,

$\mu_{i,t}$ - Random error which affects presumptions of normal distribution of the regression model².

4 Results and discussion

The Member States apply four basic types of VAT rates. They differentiate special reduced VAT rate (SRR), reduced VAT rate (RR), standard VAT rate (SR) and particular VAT rate (PR). The standard VAT rate is from all VAT rates the highest and it is applied in every Member State. SRR ranges from 17% (in Luxemburg) to 27% (in Hungary). The special reduced VAT rate (SRR) is applied only in five EU countries, meaning Ireland (4.8% for agriculture products), Spain and Italy (both 4%), France (2.1%) and Luxemburg (3%). Generally, SRR is lower than 5% and it usually is applied for basic foodstuff, such as meat, milk, fish, bread and pastry or butter. Also, with the special reduced VAT rate the Member States try to stimulate the willingness of consumers to buy certain products, such as books, musical products, sanitation services, medicine, or orthopaedic instruments. By applying the SRR, basic goods become more available particularly to socially weaker persons and elderly persons. The reduced VAT rate is applied in all the Member

² The presumptions of normal distribution are the following:

a) random failures have nil medium value ($E(\mu_{i,t}) = 0$);

b) variance of random failures is constant ($E(\mu_{i,t}^2) = \sigma_{\mu}^2$);

c) random failures are not correlated with each other

($E(\mu_{i,t}; \mu_{j,s}) = 0$, if $i \neq j$, or $t \neq s$).

¹ This method is used the most frequently in the praxis.

States, except Denmark where is applied only the standard VAT rate (25%). Some EU countries have even two reduced VAT rates, applied for precisely identified products and services. Lastly, the particular VAT rate cannot be lower than 12% and it is applied in Belgium (12%), Ireland (13.5%), Luxemburg (14%) and Portugal (13%). With the particular VAT rate are taxed power-producing products, works of art, driving schools, sport and recreational crafts or agricultural equipment (all VAT rates in the Member States are shown in Tab.1).

Tab.1: VAT rates in the EU Member States (in 2018, %)

Member State	PR	SRR	RR	SR
AT	-	-	10	20
BE	12	-	6/12	21
BG	-	-	9	20
CY	-	-	5/9	19
CZ	-	-	10/15	21
DE	-	-	7	19
DK	-	-	-	25
EE	-	-	9	20
ES	-	4	10	21
FI	-	-	10/14	24
FR	-	2.1	5.5/10	20
GR	-	-	6/13	23
HR	-	-	5/13	25
HU	-	-	5/18	27
IE	13.5	4.8	9/13.5	23
IT	-	4	10	22
LT	-	-	12	21
LU	14	3	8	17
LV	-	-	5/9	21
MT	-	-	5/7	18
NL	-	-	6	21
PL	-	-	5/8	23
PT	13	-	6/13	23
RO	-	-	5/9	20
SE	-	-	6/12	25
SI	-	-	9.5	22
SK	-	-	10	20
UK	-	-	5	20

Source: own processing

Note: PR – particular rate, SRR – Special reduced VAT rate, RR – Reduced VAT rate, SS – Standard VAT rate.

Linear regression models of the Member States

Based on our regression analysis, we found out that between selected macroeconomic indicators and household consumption in EU countries is significant influence. We tested hypothesis I, as was stated above: “Is VAT the main and decisive factor that affects the household consumption?” Also, we tested input variables on normality presumptions, as well as homoscedasticity. In the model, there are not present neither autocorrelation, nor multicollinearity. We tested every country separately. As all normality presumptions above are confirmed, we created Tab. 2, in which to every Member State are assigned main variables that influenced household consumption in that certain State.

Tab. 2: Factors affecting household consumption in the EU

Determinant	The Member State
Effective VAT	Belgium, France, Romania, Spain, Sweden
Past consumption	Czech Republic, Denmark, Estonia, Finland, France, Luxemburg, Hungary, Germany, Slovakia, Slovenia, Spain, Italy, Italy, Greece, Netherland, Ireland, Lithuania
Unemployment rate	Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Hungary, Malta, Poland, Slovakia, Slovenia, Spain, Sweden, United Kingdom, Croatia, Ireland, Lithuania, Latvia
Disposable income	Luxemburg, Malta, United Kingdom, Ireland

Total population	Czech republic, Poland, Slovakia, Sweden, Netherland, Croatia, Lithuania , Latvia
GDP per capita	Belgium, Cyprus, Denmark, Finland, France, Germany, Portugal, Austria, Sweden, Italy, Greece, Netherland
Inflation rate	Portugal, Romania, Slovakia
Income tax	Not represented in any Member State

Source: own processing based on output from R

The structure of the Member States to household consumption is various. The most important indicator that has a significant impact on household consumption is unemployment rate and past consumption. These variables had decisive impact in most the Member States, specifically unemployment rate had significant impact in 18 Member States (Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Hungary, Malta, Poland, Slovakia, Slovenia, Spain, Sweden, United Kingdom). To the Member States with the lowest unemployment rate belong Germany (4.3%), Czech Republic (4.5%), Malta and United Kingdom (both 5.1%). On the other hand, the Member States with the highest unemployment rate are Greece (24.6%) and Spain (20.5%), while the European average is at the level of 8.9%. The second most significant indicator influencing household consumption was past consumption. This factor had important impact in the following Member States: Czech Republic, Denmark, Estonia, Finland, France, Greece, Netherland, Ireland, Luxemburg, Hungary, Germany, Slovenia, Slovakia, Spain, Italy and United Kingdom. The highest value has reached Luxemburg (24 100 EUR per capita), then Denmark (20 100 EUR per capita), and on the contrary the smallest value has reached Hungary (5 000 EUR per capita) while the European average of past consumption is at the level of 12 050 EUR per capita. The next investigated indicators were GDP per capita and the total population. GDP per capita had an impact in 12 Member States (Belgium, Cyprus, Denmark, Finland, France, Greece, Netherland, Germany, Portugal, Austria, Sweden and Italy), while the highest value has reached Germany (105.3 EUR per capita), Sweden (102.5 EUR per capita) and Austria (102.1 EUR per capita). On the other hand, the smallest value has reached Greece (83.5 EUR per capita). The total population was an important indicator in 10 Member States (Bulgaria, Czech Republic, Netherland, Croatia, Lithuania, Latvia, Malta, Poland, Slovakia and Sweden). The majority of inhabitants within these EU countries is living in Germany (81.1 M.), Poland (38.02 M.) and Netherland (16.86 M.), and the less inhabitants are living in Malta (425 thous.). The average population living in the EU is 18.029 M. inhabitants per one country. The next analysed indicator was the effective VAT rate, which had an influence on household consumption only in 5 Member States (Bulgaria, France, Romania, Spain and Sweden). The highest percentage of government revenues from VAT and consumption within these countries had Sweden, France (96.82%) and Spain (63.62%), while the lowest percentage of government revenues reached Bulgaria (47.11%). Slovakia belongs to the Member States under EU average with only 61.315% of government revenues. The European average is 75.68% of revenues. Next, the value of annual disposable income was a significant indicator only in 4 Member States, specifically in Ireland (1 539 593 EUR), United Kingdom (1 439 593 EUR), Luxemburg (322 858 EUR), and Malta (112 495 EUR). The European average was at the level of 377 360 EUR. The inflation rate, as the next factor, was important in Portugal (0.6%), Romania (- 0.1%) and Slovakia (- 0.5%). Many EU countries reached negative inflation rate while the European average was at the level of 1.5%. And lastly, there was the income tax which was the only one indicator without any impact on household consumption.

5 Cluster analysis

Through the cluster analysis we identified groups of the Member States which have similar characteristics, and we tested hypothesis II. and hypothesis III.. We assumed that the new Member States of the EU and the old Member States create separated clusters. Our next presumption was that economically

advanced Member States (respectively indebted States) can create a common cluster. We applied the cluster analysis using the Ward's method. The result of this method was dendrogram with four clusters, as is shown in the following Figure 1.

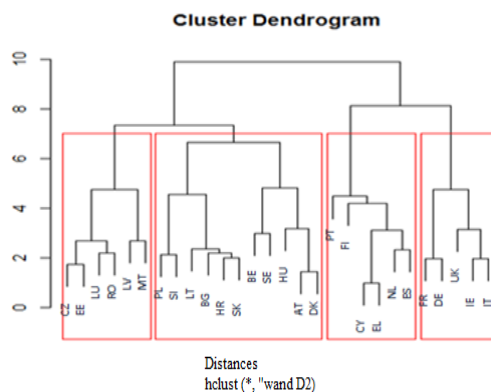


Figure 1: Dendrogram constructed by the Ward's method (in 2016)

Source: output from R

As the analysis results showed, the first cluster contained 6 Member States: Czech Republic, Estonia, Luxembourg, Romania, Latvia and Malta. So, in this cluster are the new Member States, except Luxembourg. The common characteristic that had influence on household consumption was the past consumption, the unemployment rate and the total population. The exception represents two countries, meaning Luxembourg, where the significant indicator was the past consumption (24 100 EUR per capita, as well as the disposable income in value of 322 858 EUR per capita), and Romania, where it was the effective VAT rate (at level of 48.53%) as well as the inflation rate (-0.1%). The current consumption in Czech Republic, Estonia and Luxembourg was dependent on the past consumption (Czech Republic reached 7 200 EUR per capita, Estonia 6 400 EUR per capita, and Luxembourg 24 100 EUR per capita what represents the highest value within the EU28 at the same time). The unemployment rate was common factor for Czech Republic, Estonia, Latvia and Malta, meanwhile the total population was common factor for Czech Republic (where are living 10.512 M. inhabitants in 2016), Latvia (2.033 M. inhabitants) and Malta (425 thousand inhabitants).

The second cluster was contained by 11 EU economies: Poland, Slovenia, Latvia, Bulgaria, Croatia, Slovakia, Belgium, Sweden, Hungary, Austria and Denmark. In this case, there is typical categorization between the new and old EU countries. However, differences between the States in consumption have vanished. The presumption of level of economic advancement was not very significant indicator because in the second cluster were associated the advanced Member States with the developing Member States. The results showed that in the new Member States prevails a dependence of household consumption on the unemployment rate and on the country's population. On the other hand, in the old Member States the current consumption was dependent on GDP per capita. In Bulgaria, Denmark, Croatia, Lithuania, Hungary, Poland, Slovakia, Slovenia and Sweden the significant factor that influenced consumption was the unemployment rate. Within these countries, the highest value reached Croatia (17.1%), and the lowest value reached Denmark (6.53%). Also, the indicator influencing consumption was the total population that means in Bulgaria, Croatia, Lithuania, Poland, Slovakia and Sweden. The most inhabitants are living in Poland (38.063 M.), and in Lithuania are living the least inhabitants within this cluster (2.944 M.). Next, in Denmark, Lithuania, Hungary, Slovakia and Slovenia the current consumption is affected by the past consumption. Within this cluster, the highest value achieved Denmark (20 100 EUR per capita) and the lowest value reached Hungary (only 5 000 EUR per capita). The other indicator affected consumption in the second cluster is GDP per capita, mainly in Belgium, Denmark (100.4 EUR per capita), Austria and Sweden (102.5 EUR per

capita). And the effective VAT rate is important factor in Belgium (101.36%) and in Sweden (105.44%).

The third cluster contained 6 Member States: Portugal, Finland, Cyprus, Greece, Netherland and Spain. We accepted our hypothesis in this cluster that individual clusters are created based on economic level of advancement, specifically in this case based on the economic indebtedness. The cluster was contained by Portugal, Cyprus, Greece and Spain what means the Member States which accepted financial packages and financial aid from European stability mechanism because of their enormous financial indebtedness. The others two States, Finland and Netherland belong to advanced economies. All the Member States in the cluster have approximately equal consumption, although some countries have produced consumption by their own economy, and other countries had higher indebtedness. The most significant indicator influencing consumption was GDP per capita, and particularly the past consumption as well as the unemployment rate. GDP per capita associates the Member States such as Cyprus, Finland, Greece, Netherland and Portugal, while the highest value reached Netherland (99.6 EUR per capita), and the lowest value reached Greece (83.5 EUR per capita). The past consumption associates Finland, Greece, Netherland and Spain in one group. The highest value achieved Finland and the lowest Greece (11 100 EUR per capita). And lastly, the unemployment rate in third cluster associates Cyprus, Finland and Spain.

The last fourth cluster was contained by 5 Member States: France, Germany, United Kingdom, Ireland and Italy. These countries are economically advanced and have relatively high level of economic development. However, Ireland and Italy adopted fiscal packages in 2008 to stimulate their economies, their household consumptions were as the same as in the advanced economies. To main variables influencing consumption in this cluster belong the past consumption, GDP per capita and the unemployment rate. The past consumption affected consumption in all Member States (the highest value had in the United Kingdom, 18 000 EUR per capita; and the lowest value in Italy, 15 000 EUR per capita). GDP per capita associates in one group States like France (101.3 EUR per capita), Germany (105.3 EUR per capita) and Italy (94.1 EUR per capita). The unemployment rate associates Ireland (11.26%) and United Kingdom (6.2%).

There have been many authors in literature that solved the problem of the impact of VAT on household consumption, such as Flavin (1981), Abel (1990), Wu (1997), Barrell et al. (2009) Aizenman et. al (2008), Darabos,É. (2016), Milošević, et al. (2015), Vlacsekova, et al. (2017) or Papcunova et al. (2012). According to studies of these authors, we can conclude that VAT does not work as the only one factor that influenced consumption. Except VAT, there have also been analysed and evaluated other variables with an impact on the final consumption. Also, our results comply with theoretical presumptions of household consumption. It is clear that a development of consumption is not determined only by a change in VAT rate. Therefore, when we tested our hypotheses, we focused on the past consumption, the effective VAT rate, the nominal GDP per capita, the unemployment rate, the total population, the inflation rate and the disposable income. All of these macroeconomic indicators based on our opinion affect the level of VAT rate. Value-added tax did not act as the only one factor influencing consumption in the Member States of the EU. There are many another factors influencing the final consumer, and eventually the final consumption of household. The further research in this field should be improved by selection of other variables in the panel regression. For example, as stated Barro (1991), in panel regression should be included an influence of human capital. Then, according to Porta et al. (1998) and Berkowitz et al. (2003), an impact on final consumption has also legal conditions, or a relationship between income and democracy, as Acemoglu et al. (2008) demonstrated.

6 Conclusion

Although value-added tax has got a long history in tax system, we cannot consider VAT as unchangeable instrument of the

economic policy. It is an instrument, which reacts on changes in the economic, financial and political sectors. In the recent time, the Member States of the European Union try to harmonize direct and indirect taxation within EU, in order to ensure the functioning of the common European market based on the free movement of goods, services, persons and capital. Generally, the indirect taxation is considered as less harmful than direct taxation. However, economic consequences on VAT are hardly quantified and measured. It is unnecessary to monitor and analyse VAT and its effect on household consumption because the final consumer is burdened with VAT the most from all of the economic entities. Therefore, an increase in VAT rate has a negative effect on the purchase parity of consumers, as well as on the whole economy because of a decline in consumption. In this paper, we analysed an influence of VAT on household consumption in the Member States, using the regression model and the cluster analysis. The lowest standard VAT rate within the EU is currently applied in Luxemburg (17%). On the contrary, the highest VAT rate is applied in Hungary (27%). Our analysis through the linear regression model was focused on testing the null hypothesis if VAT is the main and decisive factor influencing household consumption. This presumption has not been confirmed because the decisive factor that affects household consumption is the unemployment rate, which was found in 18 Member States. VAT was the decisive factor of consumption in only five Member States (in Bulgaria, France, Romania, Spain and Sweden). The second applied analysis in our model was the cluster analysis, which was focused on the categorization of the Member States in a certain groups of countries. Based on cluster analysis, we tested two hypotheses. The first one: "Are the Member States divided into groups of the new and old States?" was confirmed only in the fourth cluster, which associated solely the old Member States (France, Germany, United Kingdom, Ireland, Italy). In the other clusters, the old Member States were mixed with the new Member States. The second hypothesis in a form: "Economically advanced countries, or indebted countries respectively, can create a common cluster", was confirmed only in the third cluster, which was created by Portugal, Finland, Cyprus, Greece, Netherland and Spain. Within the third cluster, the Member States were associated based on the level of economic advancement, respectively in this case based on indebtedness. According to our analyses, we can sum up that VAT is not the only one factor affecting the level of consumption. The consumption of every country is individual and influenced by many specifics. Current issues in discussion about VAT represent usually questions about the effective VAT, or about the European harmonization process in taxation. To the foreground have come also inadequate tax reforms. So, experts' discussions about the future development of VAT and their possible modifications represent still continuing debate.

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Primary Paper Section: A

Secondary Paper Section: AH

MULTIPLICATIVE MODEL OF RETURN ON ASSETS IN EVALUATION OF COMPANY'S FINANCIAL SECURITY

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Abstract. The article reveals the possibilities of the multiplicative model of return on assets in the information support of financial security suggested by the authors. The authors formulated definition of financial security on the basis of integrated approach, including resource-potential, target and regulatory-legal. As a result of company financial management's interests as the main object of financial security systematized by the authors, its tasks are formulated. In accordance with objectives of the financial security system, indicators reflecting its level are grouped. The information bounds of the return on assets' indicator are critically evaluated in order to assess the level of financial security. Multiplicative model of asset efficiency is constructed, which includes eight indicators (factors). Factor analysis of the impact of eight individual financial indicators on a comprehensive indicator of return on assets is carried out on the example of food industry enterprise located in the Moscow region (Russian Federation). The conclusion about additional information opportunities of factor analysis based on the multiplicative model of return on assets in identifying internal threats to the company's financial security is made.

Key words: information, financial security, indicators, return on assets, multiplicative model.

1 Introduction

Returns on capital invested in business is the basis of company's financial system stability. Excess of income over expenditure is a source, firstly, the owner's remuneration and, secondly, the business' development. That is why in the world and domestic practice the profitability indicator, defined as the ratio of the profit received to the amount of assets (advanced in business capital) is an indicator of financial independence. Its decrease signals problems in the company's financial security ensuring. Therefore, the diagnosis of this indicator, development and preventive measures' adoption based on its results is the main objective of financial security ensuring.

Issues of financial security ensuring had acquired special significance during the economic reforms' period on the transition to a market economy at the end of the XX century and the beginning of the XXI century. The financial problems of Russian enterprises in the XXI century are due to permanent political and financial and economic crises, the globalization of the economic space, the instability of financial markets, abnormal variations in energy carrier's prices, etc. These circumstances and the conditions of the economic systems' functioning represent the main list of its financial system' dangers. All the many threats to financial security which are the result of these dangers can be divided into four groups:

- financial resources' insufficiency to provide operational and investment activities;
- loss of financial resources;
- solvency, bankruptcy;
- the cost of financial resources' growth.

Economic systems at various levels' (companies, holdings, regions and the state as a whole) functioning in the conditions of dangers and threats necessitates the searching for fundamentally new approaches to ensuring the integrity, sustainability and

ability of its further development. This circumstance implies new solutions in the company's financial security organization.

The state strategy in the field of the security of individuals, society and the state' ensuring against external and internal threats of political, economic, social, military, technological, environmental, information and other nature is defined in Presidential Decree of May 12, 2009 № 537, «About the National Security Strategy of the Russian Federation until 2020». However, companies should independently develop mechanisms to ensure its economic security in the conditions of market competition.

The essence of company's financial security according to I.A. Blank, is its ability to develop independently and implement financial strategy in an uncertain and competitive environment [Blank I.A. 2009]. The main condition for the company's financial security is its ability to withstand dangers and threats. To ensure this condition, the company's management must maintain financial stability, appropriate balance and ensure sufficient financial independence.

As an independent object of research, the company's financial security began to be considered relatively recently. Theoretical bases of financial security as a component of economic security, are investigated by many Russian scientists: G.A. Androshchuk, I.A. Blank, O.O. Borodina, M.I. Bendikov, P.P. Kraïnev, E.A. Oleynikova. Problems of company's financial security strategic planning are devoted works of E.M. Boyko, V.A. Vasilenko, S.S. Gerasimenko, N.A. Golovach, K.S. Goryachev, A.V. Grachev.

Understanding of the financial security level is concretized with the help of quantitative and qualitative indicator indicators' system which determine the state and level of financial subsystem's development. K.S. Goryacheva, T.Y. Zagorelskaya, T.B. Kuzenko, O.I. Baranovsky, O.V. Arefieva, R.S. Papekhin analyze both indicators and methods of assessing the level of company's financial security. However, a large number of existing company's financial security indicators necessitates the systematization of mentioned information through their rating scheme's creation, or search for a comprehensive indicator reflecting the role of individual indicators.

The main aim of this research was the construction on the basis of the concept of financial security of the micro-level economic system of the multiplicative model of the return on assets' indicator (advanced in business capital). The multiplicative model of the efficiency indicator of the use of capital advanced to business will allow to establish the influence on this indicator of other financial and economic indicators characterizing certain aspects of financial security.

In accordance with the purpose of the research the main tasks were identified:

- research and classification of threats to financial security of the micro-level economic system;
- systematization of financial security indicators by types of financial activity;
- development of a multiplicative model for assessing financial security and way of determination the impact of each individual factor on the level of a financial security's comprehensive measure

2 Methodology

The methodological basis of the research is the fundamental provisions of the theory of economic systems, economic security, analysis. When constructing a multiplicative model of return on assets as an integrated assessment of financial security, the method of lengthening the classical model was used. Assessment of the impact of financial indicators on a

comprehensive indicator of financial security was carried out using the method of factor analysis.

The research is based on an analysis of scientific works in the field of economic security, in particular, the development of indicators for assessing the company's financial security.

As factual material of the research, information on the results of the activity of the food industry enterprise located in the Moscow region (Russian Federation) for five years of the second decade of the XXI century was used.

3 Results

The economic system of any level includes a set of interconnected subsystems: production, financial, information, etc. The functioning of the financial subsystem is aimed at the implementation of two main objectives: firstly, ensuring the continuity of the products exchange with other companies, which in turn, implies the provision of an economic system with the financial resources in the required volume with minimal costs.

The position of the financial system as a subsystem of the economic determines the diversity and complexity of the interests of various participants in financial and economic processes:

- ensuring the production activity with sufficient financial resources at all its stages;
- timely provision of investment projects with financial resources in the required amount;
- maintaining an appropriate level of solvency, in which the company is able to repay obligations to creditors in a timely manner;
- ensuring financial stability, sustainability and independence of the company at all stages of its development;
- increasing the profitability and return of equity in general and all the activities carried out, in particular.

All the variety of financial interests of the company we systematized into four main groups:

- generating a positive cash flow in the conduct of core business;
- attracting financial resources;
- maintaining a stable financial condition of the business entity;
- performance of obligations to creditors, ensuring an appropriate level of solvency (Karzaeva N.N. 2017).

The condition of the economic entity's financial subsystem can be recognized as safe if it allows to implement a wide variety of financial interests. Therefore, there are many definitions of financial security, based on three approaches: resource-potential, target and regulatory-legal. Resource-functional approach allows to formulate the definition of financial security as a condition of the company's financial resources in the amount sufficient to meet its needs and fulfill its obligations to creditors.

From the point of view of the targeted approach, financial security is the condition of the company's financial activity which is characterized by the ability to ensure its effective functioning and economic growth, and resistance to internal and external threats.

In the context of regulatory legal regulation, financial security is a condition in which there is in reality no possibility of financial resources' illegal use.

Based on the synthesis of the resource-potential, target and regulatory approaches to the content of financial security, we previously defined it as a state in which there are no dangers or threats to financial interests of participants in financial and economic relations, including threats to financial independence and sustainability, as well as security financial resources [Karzaeva N.N. 2017].

Thus, the financial security of the company is a state of the financial system, allowing to solve three main tasks:

1. to ensure financial equilibrium, stability and solvency in the long-term;
2. to meet the need for financial resources to implement the strategic and operational tasks of its leadership;
3. to resist threats to the financial resources and financial condition of the company.

The economic entity's financial security is characterized by:

- level of sufficiency of financial resources for financing strategic and operational projects;
- stability and sustainability of its financial condition;
- stability of relations with investors, credit institutions, lenders, suppliers and buyers and other counterparties;
- level of satisfaction of owners' financial interests (shareholders, participants).

Conceptually, the formation of an financial security's effective system should be based on the integrated monitoring's creation, i.e. a multi-level system for monitoring the dynamics of the economic entity's main financial and economic processes. The obvious difficulty appears in two points. Firstly, there are many threats to financial security. This requires the development of precise criteria for financial security. And secondly, it is required to determine the levels of these criteria, the excess or failure of which will signal the reality of a certain threat [Karzaeva N.N. 2017].

The tool for assessing the company's security level is the indicators – «development benchmarks that determine the boundaries of negative processes, signaling market participants about possible areas of trouble» [Leontiev V. 1990]. The company's financial security is characterized by a system of indicators reflecting various aspects of its financial activity: maintaining a stable and sustainably financial position of the company; making settlements with agents and counteragents; financial resources' generation and attraction [Kirov A.V. 2010]. The system of financial security indicators allows to determine the presence and level of threats and risks, to develop and implement a set of preemptive measures.

To characterize the company's financial position in assessing financial security, scientists and specialists propose to apply various indicators, the general list of which includes:

- financial leverage [Badaeva O.N., Tsupko E.V. 2013; Blazhevich O.G. 2010; Volodina I.G. 2013; Gukova A.V., Anikina I.D. 2007; Ovechkinina O.N. 2013; Shevchenko L.A. 2008],
- financial stability ratio [Blazhevich O.G. 2010, Gukova A.V., Anikina I.D. 2007, Ovechkinina O.N. 2013, Shevchenko L.A. 2008],
- financing or borrowing capacity ratio [Badaeva O.N., Tsupko E.V. 2013, Gukova A.V., Anikina I.D. 2007, Shevchenko L.A. 2008],
- coefficient of equity concentration (or autonomy) (Badaeva O.N., Tsupko E.V. 2013, Gukova A.V., Anikina I.D. 2007, Shevchenko L.A. 2008);
- borrowed funds' concentration ratio [Gukova A.V., Anikina I.D. 2007];
- financial dependence (or independence) ratio [Volodina I.G. 2013, Gukova A.V., Anikina I.D. 2007];
- ratio of own funds [Badaeva O.N., Tsupko E.V. 2013, Blazhevich O.G. 2010, Gukova A.V., Anikina I.D. 2007].

Stability of financial relations with creditors, according to experts, reflects the following indicators:

- absolute, quick and current ratios [Badaeva O.N., Tsupko E.V. 2013, Volodina I.G. 2013, Gukova A.V., Anikina I.D. 2007, Sannikova I.N. Indicators of the enterprise's economic security Electronic resource - Access mode: <http://econ.asu.ru>, Shevchenko L.A. 2008];

- availability of sufficient funds to pay for financial obligations in the current period [Gukova A.V., Anikina I.D. 2007];
- ratio of interest to pay [Gukova A.V., Anikina I.D. 2007];
- capital structure;
- accounts payable turnover [3, Blazhevich O.G. 2010, Ovechkina O.N. 2013];
- indicator of overdue accounts payable [Gukova A.V., Anikina I.D. 2007, Sannikova I.N. Indicators of the enterprise's economic security Electronic resource - Access mode: <http://econ.asu.ru>];
- ratio of turnover of receivables and payables [Gukova A.V., Anikina I.D. 2007];
- indicator of supplier diversification [Gukova A.V., Anikina I.D. 2007].

The ability to generate and attract financial resources to finance strategic and operational projects of the company, according to experts, can reflect such indicators as:

- return on assets, current on current assets [Badaeva O.N., Tsupko E.V. 2013,6, Shevchenko L.A. 2008];
- return on products sold [Badaeva O.N., Tsupko E.V. 2013, Ovechkina O.N. 2013];
- return on total capital [Blazhevich O.G. 2010,14];
- return on equity [Badaeva O.N., Tsupko E.V. 2013, Blazhevich O.G. 2010, Gukova A.V., Anikina I.D. 2007, Ovechkina O.N. 2013];
- sales margin [Badaeva O.N., Tsupko E.V. 2013, Blazhevich O.G. 2010, Shevchenko L.A. 2008];
- return on investment;
- return of production [Sannikova I.N. Indicators of the enterprise's economic security Electronic resource - Access mode: <http://econ.asu.ru>];
- growth rates of assets, revenues, profits [Badaeva O.N., Tsupko E.V. 2013, Blazhevich O.G. 2010, Gukova A.V., Anikina I.D. 2007, Ovechkina O.N. 2013];
- assets turnover [Shevchenko L.A. 2008];
- turnover of circulating, own, loan capital [Badaeva O.N., Tsupko E.V. 2013];
- accounts receivable turnover [Badaeva O.N., Tsupko E.V. 2013, Blazhevich O.G. 2010, Ovechkina O.N. 2013];
- coefficient of funds' reinvestment;
- degree of coverage of investment opportunities;
- ratio of the value of domestic and external financing;
- weighted average cost of capital (WACC) [Badaeva O.N., Tsupko E.V. 2013, Gukova A.V., Anikina I.D. 2007];
- indicators of customer diversification [Blazhevich O.G. 2010, Gukova A.V., Anikina I.D. 2007, Ovechkina O.N. 2013];
- amount of overdue accounts receivable [Gukova A.V., Anikina I.D. 2007, Sannikova I.N. Indicators of the enterprise's economic security Electronic resource - Access mode: <http://econ.asu.ru>];
- volume of the orders portfolio [Sannikova I.N. Indicators of the enterprise's economic security Electronic resource - Access mode: <http://econ.asu.ru>].

Experts do not consider indicators that reflect the level of owners (shareholders, participants) financial interests' satisfaction.

The main threat to the financial independence of the company is the reduction (loss) of income on advanced in business capital. Therefore, in assessing the company's financial performance, it is very important to assess the profitability of the return on assets (property at the disposal of the enterprise), own funds, financial investments (investments).

Return on assets is the most common indicator that reflects the amount of profit received per unit of property used in the company's activity. Its level depends on the level of satisfaction of the economic interests of both the company and its owners.

Return on assets (ROA) in russian and foreign practice is determined on the basis of the following analytical dependencies:

return on assets

$$R_a = \frac{P_{it}}{A} \times 100; \quad (1)$$

where

P_{it} - profit before tax and interest;

A – average annual value of aggregate (non-current and current) assets.

Return on assets (ROA) depends on sales profitability (S) and the level of aggregate (non-current and current) assets' use. If the

factor ($\frac{S}{A}$) is introduced in the initial formula of return of assets, it will take the following form:

$$R_a = \frac{P_{it}}{S} \times \frac{S}{A} \times 100\% \quad (2)$$

The first factor of this two-factor model is sales margin. The second factor is total assets turnover.

This dependence shows possible directions for improving the return on assets:

- with low profitability of output, it is necessary to seek for accelerate the turnover of assets and their elements;
- company's low business activity can be compensated by lower costs for production or increase in its sales prices.

Based on the analysis, we found that the models considered information are limited because they do not include factors reflecting the level of financial security, even those regulated in Russian Federation (Methodological guidelines for conducting an analysis of the organizations' financial status: Appendix to the Order of the Federal Service of Russia for Financial Rehabilitation and Bankruptcy of Russian Federation on 23.01.2001 № 16 / Consultant Plus Electronic resource - Access mode: <http://www.consultant.ru>).

In the practice of economic analysis for a more in-depth study of the factors that affect the return on assets, the three-factor model of DuPont is widely used:

$$R_a = \frac{P}{A} = \frac{P}{S} \times \frac{S}{E} \times \frac{E}{A}; \quad (3)$$

where

$\frac{P}{S}$ - sales margin;

$\frac{S}{E}$ - turnover of own capital;

$\frac{E}{A}$ - financial independence ratio or share of equity in the enterprise assets.

The DuPont model was constructed by extending the conventional (classical) model of return on assets.

4 Discussion

Applying the extension method, we proposed to construct a multiplicative model of return on assets using a broader list of financial indicators (factors):

$$R_a = \frac{P}{S} \times \frac{S}{SA} \times \frac{SA}{CL} \times \frac{CL}{AR} \times \frac{AR}{CR} \times \frac{CR}{FR} \times \frac{FR}{E} \times \frac{E}{A} \quad (4)$$

where

P - profit before taxes and interest;

S - revenue from sales of products;

SA - current assets;

CL - short-term obligations of the firm, which include liabilities to creditors for commodity transactions and short-term obligations under loan agreements;

AR - accounts receivable;

CR - liabilities to creditors for commodity transactions;

FR - short-term and long-term obligations under all contracts;

E - amount of equity;

A - current and non-current assets (Zimin N.E. 2016).

The multiplicative model of profitability of capital use includes 8 factors:

$\frac{P}{S}$ - sales margin characterizes the impact of the company's pricing policy and sales volume on the level of return on assets;

$\frac{S}{SA}$ - assets turnover characterizes the efficiency of the use of current assets;

$\frac{SA}{CL}$ - current ratio characterizes the solvency of the enterprise subject to the sale of all the reserves and the repayment obligations by the debtors;

$\frac{CL}{AR}$ - ratio of short-term liabilities of the company to the obligations of debtors to it characterizes the degree of coverage of accounts receivable short-term company's liabilities and is an indicator of its financial stability;

$\frac{AR}{CR}$ - ratio of receivables to payables for commodity transactions shows the dependence of the enterprise on creditors and debtors. According to many scientists' opinion, it serves as an assessment of the company's security against inflation: the smaller the value of this indicator, the higher the degree of protection against inflation. However, this assertion is controversial, since at its core, in the presence of overdue debts, it reflects the level of financial relations of economic entities' imperfection. The presence of large amounts of unliquidated obligations leads to a loss of interest in the economic cooperation of business partners. Earlier, we noted in our works that violation of the contracts' terms is a threat to the financial security of both parties and leads to financial inflationary risks, financial losses in the form of penalties and fines, a decrease in the return on equity [Zimin N.E. 2016];

$\frac{CR}{FR}$ - ratio of the company's obligation to creditors for commodity transactions to the total amount of borrowed capital characterizes the structure of its obligations by types of contracts: the attraction of funds under loan agreements and contracts concluded in the business activity;

$\frac{FR}{E}$ - ratio of debt to equity is an indicator of the company's financial stability;

$\frac{E}{A}$ - ratio of equity to total assets shows the concentration of own assets and the degree of financial independence of the company.

We note that the analytical solution of this multiplicative model will allow to determine the level and direction of the each factor (element) influence on changes in the resulting indicator of profitability of the return on assets. The factor model of the return on assets, we propose to solve one of the methods of elimination, for example, by the method of differences:

$$\Delta R_{\frac{P}{S}} = \left(\frac{P_1}{S_1} - \frac{P_0}{S_0} \right) \times \frac{S_0}{SA_0} \times \frac{SA_0}{CL_0} \times \frac{CL_0}{AR_0} \times \frac{AR_0}{CR_0} \times \frac{CR_0}{FR_0} \times \frac{FR_0}{E_0} \times \frac{E_0}{A_0}; \quad (5)$$

$$\Delta R_{\frac{S}{SA}} = \frac{P_1}{S_1} \times \left(\frac{S_1}{SA_1} - \frac{S_0}{SA_0} \right) \times \frac{SA_0}{CL_0} \times \frac{CL_0}{AR_0} \times \frac{AR_0}{CR_0} \times \frac{CR_0}{FR_0} \times \frac{FR_0}{E_0} \times \frac{E_0}{A_0}; \quad (6)$$

$$\Delta R_{\frac{SA}{CL}} = \frac{P_1}{S_1} \times \frac{S_1}{SA_1} \times \left(\frac{SA_1}{CL_1} - \frac{SA_0}{CL_0} \right) \times \frac{CL_0}{AR_0} \times \frac{AR_0}{CR_0} \times \frac{CR_0}{FR_0} \times \frac{FR_0}{E_0} \times \frac{E_0}{A_0}; \quad (7)$$

$$\Delta R_{\frac{CL}{AR}} = \frac{P_1}{S_1} \times \frac{S_1}{SA_1} \times \frac{SA_1}{CL_1} \times \left(\frac{CL_1}{AR_1} - \frac{CL_0}{AR_0} \right) \times \frac{AR_0}{CR_0} \times \frac{CR_0}{FR_0} \times \frac{FR_0}{E_0} \times \frac{E_0}{A_0}; \quad (8)$$

$$\Delta R_{\frac{AR}{CR}} = \frac{P_1}{S_1} \times \frac{S_1}{SA_1} \times \frac{SA_1}{CL_1} \times \frac{CL_1}{AR_1} \times \left(\frac{AR_1}{CR_1} - \frac{AR_0}{CR_0} \right) \times \frac{CR_0}{FR_0} \times \frac{FR_0}{E_0} \times \frac{E_0}{A_0}; \quad (9)$$

$$\Delta R_{\frac{CR}{FR}} = \frac{P_1}{S_1} \times \frac{S_1}{SA_1} \times \frac{SA_1}{CL_1} \times \frac{CL_1}{AR_1} \times \frac{AR_1}{CR_1} \times \left(\frac{CR_1}{FR_1} - \frac{CR_0}{FR_0} \right) \times \frac{FR_0}{E_0} \times \frac{E_0}{A_0}; \quad (10)$$

$$\Delta R_{\frac{FR}{E}} = \frac{P_1}{S_1} \times \frac{S_1}{SA_1} \times \frac{SA_1}{CL_1} \times \frac{CL_1}{AR_1} \times \frac{AR_1}{CR_1} \times \frac{CR_1}{FR_1} \times \left(\frac{FR_1}{E_1} - \frac{FR_0}{E_0} \right) \times \frac{E_0}{A_0}; \quad (11)$$

$$\Delta R_{\frac{E}{A}} = \frac{P_1}{S_1} \times \frac{S_1}{SA_1} \times \frac{SA_1}{CL_1} \times \frac{CL_1}{AR_1} \times \frac{AR_1}{CR_1} \times \frac{CR_1}{FR_1} \times \frac{FR_1}{E_1} \times \left(\frac{E_1}{A_1} - \frac{E_0}{A_0} \right); \quad (12)$$

where ΔR_i - influence of the i-th factor on the overall change in the return on assets;

1 – reporting year,

0 – base year.

The analytical implementation of the proposed model was approved by the example of a functioning food industry enterprise located in the Moscow region (Russian Federation). The main indicators that characterize its financial position and results of operations are presented in Table 1. The company does not have long-term obligations under loan agreements, as it is not solvent and can not provide collateral.

Table 1 Evaluation of factors affecting on the return on assets

Indicators, algorithms for their determination	The analyzed period (years)					Variation, %
	1-st	2-nd	3-rd	4-th	5-th	
1	2	3	4	5	6	$7 = \frac{(6-2)}{2} \times 100$
Initial information for the diagnosis of the influence of factors, thousand rubles						
1. Profit before taxes and interest, (P)	123735	120222	147166	131776	7065	-194,29
2. Revenue from sales of products, (S)	1430362	1485046	1626585	1746140	1829059	+27,87
3. Net profit (loss)	22946	19909	20036	53137	-38843	-269,28
4. Current assets, (SA)	235782	269164	281632	313873	341841	+44,98
5. Short-term obligations of the firm, which include liabilities under loan agreements, (CL)	85085	93351	120604	102101	208989	+145,62
6. Accounts receivable, (AR)	131023	134813	125556	97059	202393	+54,47
7. Accounts payable, (CR)	69445	80943	107337	89896	190559	+1,74
8. Borrowed capital, (FR)	85091	93351	120604	102101	208989	+145,61
9. Equity, (E)	399870	419785	439821	492957	454115	+13,57
Estimated values of factors						
10. Sales margin, $(i.1:i.2) \times 100$, $(\frac{P}{S})$	8,65	8,10	9,04	7,55	0,38	-95,61
11. The ratio turnover of current assets, $(i.2:i.4)$, $(\frac{S}{SA})$	6,07	5,52	5,78	5,56	5,35	-11,86
12. Current ratio, $(i.4:i.5)$, $(\frac{SA}{CL})$	2,77	2,88	2,33	3,07	1,64	-40,79
13. Ratio of short-term liabilities to accounts receivable, $(i.5:i.6)$, $(\frac{CL}{AR})$	0,65	0,69	0,96	1,05	0,3	+58,46
14. Ratio of receivables to payables for commodity transactions, $(i.6:i.7)$, $(\frac{AR}{CR})$	1,89	1,67	1,17	1,08	1,06	-43,92
15. Ratio of the company's obligation to creditors for commodity transactions to the total amount of borrowed capital, $(i.7:i.8)$, $(\frac{CR}{FR})$	0,82	0,87	0,89	0,88	0,91	+10,98
16. Ratio of debt to equity, $(i.7:i.8)$, $(\frac{FR}{E})$	0,21	0,22	0,27	0,20	0,46	+119,05
17. Ratio of equity to total assets, $(i.9:(i.7+i.8))$, $(\frac{E}{A})$	0,62	0,82	0,78	1,21	1,46	+76,05
18. Return on assets, $(i.3:(i.8+i.9)) \times 100$, RA	4,73	3,88	3,58	8,93	-5,86	-10,59

Table 2 The factors' impact on return on assets, %

Factors	Perion (year)				Total (for all periods)
	2-nd	3-rd	4-th	5-th	
Sales margin, $(\frac{P}{S})$	-1,60	+1,14	-3,19	-2,95	-6,4

Assets turnover, ($\frac{S}{SA}$)	-2,14	+1,26	-1,85	-0,13	-2,86
Current ratio, ($\frac{SA}{CL}$)	+0,85	-3,99	+2,20	-0,15	-1,09
Ratio of short-term liabilities to accounts receivable, ($\frac{CL}{AR}$)	-1,37	+10,00	+13,75	+0,85	+23,23
Ratio of receivables to payables for commodity transactions, ($\frac{AR}{CR}$)	-2,76	-11,98	-15,48	-0,40	-30,62
Ratio of the company's obligation to creditors for commodity transactions to the total amount of borrowed capital, ($\frac{CR}{FR}$)	+25,55	+1,65	+1,44	+0,09	+28,73
Ratio of debt to equity, ($\frac{FR}{E}$)	+1,06	+11,88	-7,36	+0,12	+5,7
Ratio of equity to total assets, ($\frac{E}{A}$)	+28,4	-4,86	+10,03	+0,62	+34,19

It should be noted that the dynamics of all indicators for the analyzed period is negative and indicates about deterioration in the company's financial position and inefficiencies in its activities. There is a maximum change in two factors: the ratio of borrowed capital to own (119%) and sales margin (95%).

However, the indicators have a different effect on the return on assets. Its importance is increased by the ratios of short-term liabilities to receivables and the ratio of payables to borrowed capital, the ratio of debt to equity ratio, and the ratio of equity to assets. Indicators of sales margin, turnover of current assets, current ratio, ratio of accounts receivable to payables reduce the value of the level of return on assets. At the same time, the maximum influence of the ratio of accounts receivable to payables (30%) and the ratio of equity to assets (34%) is noted.

In this research, we did not pursue the goal to create a program of activities aimed at improving the company's operations efficiency. Analysis of the results of the multiplicative model of return on assets application allowed us to establish that its information boundaries are wider than the basic model and allow us to establish additional problematic aspects of the company's activities.

5 Conclusion

1. The effectiveness of the financial security system is determined by the list of objects' completeness, the security of which it must provide. We applied an integrated resource-potential, target and regulatory approach to disclosing the content of financial security. As a result, we identified the financial interests of participants in economic activity as objects. All the variety of financial interests at the company level we systematized into four main groups:

- generating positive cash flow by main activity;
- attracting financial resources to ensure investment projects;
- maintaining a stable financial condition of the company;
- ensuring an adequate level of solvency.

Therefore, the composition of financial security objects include: the interests of participants in financial activities, cash flow, the price of financial resources, profitability, financial condition of the company, solvency.

2. The plurality and complexity of financial security' objects predetermine many indicators that characterize their level of security. Therefore, we proposed this list to be divided into three groups in accordance with the objectives of ensuring financial security:

- to ensure financial equilibrium, sustainability and solvency in the long-term period;
- to meet the need for financial resources to implement the strategic and operational tasks of its management;
- to resist threats to the financial resources and financial condition of the company.

3. The main internal threat to the company's financial security is the reduction (loss) of income, on which the levels of many indicators of the financial condition and performance of the company depend. Therefore, as a basic indicator of financial security, we proposed to apply the return on assets indicator, reflecting the amount of profit received per unit of property used in the activity.

4. The level of the return on assets is influenced by many factors that are essential for the development of preventive instruments for ensuring financial security. For this purpose, we built a multiplicative eight-factor model of return on assets. With help of factor analysis using the difference method is established effects of model's individual elements on the use of assets effectiveness.

5. We tested the multiplicative model of the return on assets on the data of the company operating in the Moscow region (Russian Federation) and proved that its application expands the

information boundaries. Factor analysis of the influence of model's individual elements on a complex indicator of return on assets made it possible to identify problem areas of company's financial activity that were not established in the analysis of particular indicators.

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Primary Paper Section: A

Secondary Paper Section: BC

WORKING IN THE VIRTUAL WORLD – AN APPROACH TO THE “HOME OFFICE” BUSINESS MODEL ANALYSIS

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Abstract: More and more employees are working outside of traditional on-site work environments in locations connected electronically to a central office. This telework or telecommuting practice has become an increasingly important employment tool, fulfilling key business needs while helping employees balance their work and personal commitments. The aim of this paper is to emphasize the importance of homeworking rather than working in the office, to identify the specific advantages and disadvantages, distinguishing between them. A total of 308 individuals from many countries worldwide took part in the online survey. The interest in working at home, how the intensity of working in a Home Office affects productivity, coping with demands, communication, work-life balance, career satisfaction were analyzed. The overall results indicate that people prefer to work at home rather than in traditional office, that a Home Office has a positive influence on the personal work experience.

Keywords: “Home Office” Business Model, Home Workers, Information and Communication Technologies (ICT), Teleworking, Telecommuting, Enterprise Performance, Virtual World.

1 Introduction

The industrial revolution brought employees from their homes to the factories. With information and communication technologies (ICT), the reverse is possible, with employees able to move back into their homes (Simitis, 1986). The flexibility for jobholders to be able to work any time at any place is technically feasible for many employees and has been for many years. In the literature there seems to be the term anywhere working subject for over forty years (Hunton and Strand, 2010; Nilles, 1975; Wilkes and Frolick, 1994).

The spread of globalization and the development of modern innovative technologies, social changes and, associated with them, the increase in collective environmental awareness, have augmented the interests in mobile and alternative forms of working in recent years (Chung, 2015; Manyika et al., 2016; UNDP, 2015). The population is exploring products and services through ICTs, e.g. desktops, laptops, tablets, smartphones and even virtual reality devices. Using these technological innovations, more and more organizations have started to redesign their approach to work. We feel strongly that central to this new approach is that the employees are asked to organize their work flexibly.

Jobs have always been one of the most defining aspects of our lives. “Telecommuting”, which originated in the 1970s as a response to the oil crisis and concerns over employees’ potential inability to travel to and from the office, involves employees completing work tasks outside of the traditional office (Böll et al., 2014; Torten et al., 2015, 2016). The term “telecommuting”, first introduced by Nilles (Nilles et al., 1974), provides a new means of interaction between employees and employers (Baltina and Vitola, 2014; Muasa, 2014; Pica, Dinu, 2016). It entails an employee working from home, and carrying out his/her working activities outside the employer’s premises. Typically, work is done at the employee’s residence, but there may be other locations as well. “Telework” is the preferred term in Europe and other countries, while in the U.S., “telecommute” is preferred (Bairnsfather and Ringelberg, 2004; Baltina, 2012; Baltina and Vitola, 2014).

The terms *home office* and *homeworking* are often associated with this type of employment. It is important to note that *home office* rather indicates a special situation when the employee occasionally works at home for some reason/s, while *homeworking* indicates work tasks performed at home as an agreed standard. *Homeworkers* is a category of employees who carry out their professional activities from their own homes (OECD, 2001). Work from home can be carried out only within

a standard contractual employment relationship between employee and employer. This means that the employer and employee have their rights and obligations set out by law. Work from home is always the subject of internal entrepreneurial agreements. Therefore, an employer cannot force an employee to work from home, and an employee cannot demand it from an employer. If an employee works from home, the total working hours are regulated by the contracted job time as in any other type of job. However, a homemaker can schedule his/her working time more at his/her own personal discretion.

Jobholder is expected to decide for it selves when he/she works (schedule flexibility), where he/she works (telecommuting), and by which communication tool/medium (smartphone, email, videoconference) he/she works (Baarne et al., 2010; Ten Brummelhuis et al., 2012). Baarne et al. (2010) implements three key characteristics of New Ways of Working. First the timing of work has become more flexible. Second, NWW offer the employee various options for the place of work, including the office, home, and during commuting time (e.g. on the train, on the bus, on the airplane). At the office, employees no longer have fixed workspaces (Kelliher and Anderson, 2008). Third, NWW are facilitated by modern media technologies such as smartphones, iPad, Skype, and videoconferencing. This concept offer workers various options for communication with co-workers, supervisors, and clients, including phone calls, email, online messaging, and (online) virtual meetings (Baarne et al., 2010).

As mentioned earlier, “telecommuting” is prevalent in the U.S. According to the National Study of the Changing Work-force, 63 % of employers allow some employees to telecommute occasionally, 33 % allow some employees to telecommute on a regular basis (Shockley, 2014).

Shockley (2014) mentions the researches in telecommuting. In fact, more than 50 peer-reviewed published studies, by means of two usual methods, focus on the organizational and/or personal outcomes of those who telecommute. The most scientifically sound method is by experiment or quasi-experiment. The second and most common type of design involves the use of surveys. Surveys include questions about an employee’s telecommuting status and the outcome variables of interest (Shockley, 2014).

This paper is organized as follows: In the following section, we briefly outline the methodology which we used for the three-step research project. The third section gives a brief overview of the concept of distance working, where we attempt to define the terms such as teleworking, telecommuting, and homeworking. The statistical information to track and measure telecommuting in selected countries is analyzed in the fourth section. In the fifth section, a case study is presented to analyze the results of the survey. Our conclusions are drawn in the final section.

2 Methodology

We carried out a three-step research project to study the Home Office and homeworking. The first step was a literature review on the extent and nature of homeworking worldwide. Secondly, from the accessible data, we examine a statistical overview of this form of work around the world. The final step investigates the issues, benefits and disadvantages of office workers versus homeworkers. Specifically, we explore telecommuting as it affects the employee, employer and society. Data from an online survey examine the viability of telecommuting work arrangements. The survey is an appropriate research strategy, because the purpose of the study is to describe the incidence of the phenomenon under investigation.

Electronic surveys provide the ability to conduct large-scale data collection by other than organizations at the centers of power in society (Couper, 2000). Technology provides an inexpensive

mechanism for conducting surveys online, instead of through the postal service (Sheehan and Hoy, 1999; Weible and Wallace, 1998) and one in which costs per response decrease instead of increase significantly as sample size increases (Watt, 1999). Electronic surveys are becoming increasingly common (Lazar, J and Preece, J., 1999), and research comparing electronic vs. postal surveys is starting to confirm that electronic survey content results may be no different from postal survey content results, yet provide the distinct advantages of speedy distribution and response cycles (Swoboda, et al., 1997; Yun and Trumbo, 2000).

One can divide the collection of survey data via computers into three main categories, based upon the type of technology relied upon to distribute the survey and collect data, as follows: point of contact, email-based and web-based. In this paper, we decided to use the third option. The final form of electronic survey, and the technique currently receiving the most interest of researchers (Stanton, 1998; Zhang, 2000), is the web-based survey. This is generally defined as those survey instruments that physically reside on a network server (connected to either an organization's intranet or the Internet), and that can be accessed only through a web browser (Green, 1995; Stanton, 1998).

Because a web-based survey is actually created through the use of a coding language, the potential exists for the survey to change, based upon previously answered questions (e.g. providing a different set of questions based on reported tenure in the organization). In addition, these surveys can use animation, voice, and video to enhance the user experience.

For example, one study provided a sidebar of events that occurred in the year of the respondent's self-reported birth date, to assist the respondent with recall, as well as to maintain motivation to respond to the survey (Witte, Amoroso, and Howard, 2000). Finally, web-based surveys are often connected directly to a database where all completed survey data are categorized and stored for later analysis (Schmidt, 1997; Lazar and Preece, 1999). Web-based surveys can either be sampled or self-selected. The sampled category describes respondents who were chosen using some sampling method (i.e. randomly selected from a larger population), notified of the chance to participate, and directed to the survey's website. In contrast, the self-selected category includes those respondents that happen across the survey in the course of their normal browsing (e.g. search results, web advertisement, etc.) and are not proactively solicited by the researcher.

The rapidly expanding body of literature on electronic survey techniques reflects a growing concern among researchers as to the methodological issues associated with their use (Couper, 2000; Dillman, 1978, 1991; Fink, 1995; Fowler, 1995; Krosnick, 1999).

The survey questionnaire which was activated during the entire period from 19.10 till 18.11.2016 contained several types of questions for respondents to answer. Some questions were also open-ended, which allowed respondents to submit their own answers. Other questions allowed respondents to note their answers on a different scale, with the ranges varying from negative to positive, and disagree to agree. A few of the questions required respondents to check appropriate responses. The survey was mailed out to employees in different countries using the following link <http://www.surveio.com/survey/d/K6U7B3U1J9E6L3O3H> and also through different new ICT to obtain the necessary response rate of 52.74 % (308 questionnaires were completed). The survey was coded, so that it was possible to determine employee type (management, non-management, homeworkers).

Respondents were asked to answer questions relating to working at home, with various scale answer options used related to the interrogation. The research was conducted from a normative perspective, and attempted to take into account both the viewpoints of the employees and of the employer, including their perspectives on homeworking.

3 Framework and genesis of distance working

In the Introduction, we presented telecommuting, teleworking and home working as the same concept. The meaning of the concept is to "work at a distance" or, in our case "to work from a home office". Among the popular terms that cover telecommuting, we understand remote work, home office work, telework, location-independent tasks and home-distributed data processing (Cross, 2017). It is difficult to distinguish between the virtual office and varieties of telecommuting, because terminology differs from study to study.

The concept seems simple, but implementation requires a slightly different perspective from both the employee and employer. Teleworking is beneficial to both, for a variety of reasons:

- For the employer, telework has been found to contribute to reduced company costs related to office space and parking, decreased turnover rates, increased productivity, and reduced absenteeism and tardiness;
- For the employee, benefits include factors such as decreased commuting time, more flexible scheduling options, and the option of providing care to dependents while working;
- In addition, teleworking has been shown to be beneficial to the environment in terms of reduced fuel emissions and reduced use of electricity. This was the expectation of the Clean Air Act, which was instituted in order to help reduce the carbon footprint of the United States (O'Sullivan and Student, 2013).

As mentioned in the Introduction, Nilles first coined the term "telecommuting" in the 1970s. The practice of telecommuting, or alternatively telework, has been heralded as the cure for a variety of organizational and social skills (Hynes, 2014; O'Sullivan and Student, 2013). It has been lauded as a strategy to assist organizations to decrease real estate costs, respond to employees' needs for a healthy work-family balance, and to aid compliance with the 1990 Americans with Disabilities Act (O'Sullivan and Student, 2013). Moreover, various studies on the effects of teleworking on quality of life have found telecommuting to constitute a popular time- and energy-saving method for employees (Azarbouyeh and Naini, 2014; Baruch, 2000).

Telecommuting is not a new concept. The term was defined as: "the partial or total substitution of telecommunications for the daily work trip" (Kim, 2015). It has been the object of many scientific articles and studies over the years. It seems less scientific studies were done in America than in Britain (Felstead & Jewson, 2000; Felstead, Jewson, Walters, & Phizacklea, 2000a, 2000b; Huws, Wermer, & Robinson 1990; Cooper, 1996; Kurland & Bailey, 1999). Telework has attracted interest in Canada (Akyeampong & Nadwodny, 2001; Duxbury, Higgins, & Neufeld, 1998; Menzies, 1997). We are of the opinion that many of these studies investigate all forms of home work simultaneously, further most of them are concentrated on one or few professional groups.

Staples survey illustrates that "managing employees who are located remotely from their manager is a key issue in telecommuting and virtual organizational structures and IT is a key enabler of remote work". This concept is also supported by Hartman et al., who state that "advancing technology has made it increasingly feasible to work from remote sites; in this context telecommuting has become one of the mechanisms management may utilize to meet pressing human resource challenges" (Davis, 2011).

There is no single widely accepted definition of what telecommuting entails, and there are difficulties in counting telecommuters because not all telecommuters do this type of work all the time. However, the core definitions of telecommuting and telework are based on the terms as defined by Dr. Jack Nilles (Davis, 2011).

Some surveys do not differentiate between people who work at home in home-based businesses and those who telecommute from their homes. Finally, the sampling methods of some surveys differ sufficiently to make comparison and averaging impossible. Given these limitations, the estimates below vary accordingly (Marcus, 1995), as shown in Table 1 from the US perspective.

Table 1. USA Survey on Telecommuting

Year and Source	Estimated values
1992 Link Resources (Telecommuting) and Mokhtarian, 1993	6.6 million telecommuters in 4.9 million households 77 % white collar 59 % conventional employees, 41% contract-based 19 % work 35 hours or more per week at home 18.3 hours at home weekly average 81 % work for businesses with fewer than 100 employees
1987 (Fathy, 1991)	200 000–250 000 telecommuters
1985 (Forbes, 1985)	100 000 telecommuters
1984 (Kelly, 1986)	4–5 million telecommuters, including part-time telecommuters

Source: author according to (Marcus, 1995)

Telework has also been promoted as a method of reducing air pollution and traffic congestion (Bailey and Kurland, 2002; Hynes, 2013). The theory of teleworking, which initially referred to working from a home office, further expanded over the years because of the availability of computer technology (ICT), which has enabled the substitution of a physical office with a remote one, including satellite centers, home-based offices, and neighborhood work centers (Hynes, 2014).

Technology has enabled us to be untethered from specific times and places of work. We now have easy access to information from any location, and at any time we need it. Companies are struggling to determine how to leverage mobility for competitive advantage (O'Neill, 2009).

Research shows that telework generally increases work performance and productivity, as well assists employees to have higher dedication and morale, and a higher energy level on the job, due to elimination of wasted time (Hill et al., 2003). However, some results show that job satisfaction does not differ between teleworkers and non-teleworkers.

The term “*flexible working*” has been used in a broad sense to cover a range of working patterns, including reduced hours, non-standard hours, various forms of remote working, and compressed working time, with the central feature being that it is the employee, not the employer, who chooses the working arrangement, known as flexibility for employees (Kelliher and Anderson, 2010). The stereotype is that mobile workers are young and female (for instance, young mothers working at home). In fact, several studies show that most mobile workers (65 %) are men and are aged over 40 years. While it has traditionally been assumed that only specialist workers (e.g. salespeople, auditors, consultants) spend significant periods away from the office, research shows that all levels of staff work outside the office, and 40 % hold leadership positions in their organizations. Policies and workspaces supporting mobility are a big draw for older workers. Most Baby Boomers, who state that they want to extend the number of years they remain in the workforce, feel that the typical, traditional workplace arrangement (e.g. inflexible work hours, dedicated workspace, commuting to one location) is out of step with the potential for time/place mobility which they actually possess. A recent study found that younger workers view mobile work as directly related to their quality of life. Thus, space and the policies that support mobility for these workers will improve their perceived quality

of life and sense of belonging to the organization (O'Neill, 2009).

In our analysis, we discovered that there are no clear, standard definitions for telecommuting, teleworking or homeworking. Indeed homework does not mean the sum of persons working at home, but on the contrary, is the sum of persons performing officially classified employment duties from a home, which can be a workplace for official work. We think that it is generally taken to involve working in a separate, central workplace, using ICTs.

Different people use the different concepts in diverse ways, linking them to a wide range of work arrangements, including mobile work, work in any location outside the usually accepted work premises of the employer, work in a shared office center or hub, and home-based work (Bradshaw and Hirose, 2016). Telecommuting has been lauded as a strategy to help organizations decrease real-estate costs, and to respond to employees' needs for a healthy work-family balance.

The number of employees working from home is increasing and has significant benefits for both parties in various types of work, such as call centers, selling home-made products, consultancy, etc. (Reshma et al., 2015).

The term “teleworking” has been approached in different ways. Several authors have attempted to characterize developments, to define it as “remote working”, “distance working” (Holti & Stern, 1986a & 1986b) or “outwork” (Probert & Wajcman, 1988). The prefix “tele-” means “distance”, therefore the term “telework” means “work at a distance”. In Europe and other countries, the term “telework” is preferred, while in the USA “telecommute” is more common (Bairnsfather & Ringelberg, 2004). Others seek to categorize the various forms of the concept, such as “home work”, “alternative officing” and “mobile working” (Gordon, 1996).

In 1990, the International Labor Organization (ILO) proposed the following definition of telework: “*A form of work in which (a) work is performed in a location remote from a central office or production facilities, thus separating the worker from personal contact with co-workers there; and (b) new technology enables this separation by facilitating communication*” (Ruiz and Walling, 2005).

In 1996, the ILO adopted Convention No. 177 on Home Work. It called on all countries of the world to develop policies to improve the conditions of their citizens who are homeworkers. This was a very important step towards getting the contribution and rights of homeworkers recognized across the world (Mehrotra and Biggeri, 2007).

A consolidated report by the European Foundation for the Improvement of Living and Working Conditions states that “*Telework is the work performed by a teleworker (employee, self-employed, homeworker etc.), mainly or for an important part, at (a) location(s) other than the traditional workplace for an employer or a client, involving the use of telecommunications*” (Ruiz and Walling, 2005).

The Department for Trade and Industry (DTI), in conjunction with the CBI, TUC and CEEP UK, has published guidance on teleworking. This states that the essential feature of teleworking is “*the use of information and communications technologies to enable remote working away from the office*” (Ruiz and Walling, 2005).

The OECD definition states that “*work at home includes those economic activities that are conducted from units or offices within the home. This category includes farmers who work and live on their farms, persons working and living at work camps, and those engaged in own-account production of goods*” (OECD, 2001).

4 Prevalence of Telecommuting (Teleworking) around the world

Telecommuting known as “working from home”, or “e-commuting”, is a modern work arrangement or occupational category. However, only few countries gather statistical information to track or measure its progression. In this paper, we provide only a partial illustration of the prevalence of telecommuting. With these limited data, we are able to present a general view of the situation in this field in some of the following listed countries.

4.1 Australia

Table 2 illustrates the number of Australian homeworkers from 1998 to 2002. We assume that this number of teleworkers will continue to rise. The Australian Bureau of Statistics survey which covered 3 900 households, showed that in 2006, just 6 % of the total Australian workforce was involved in telework (Shieh and Searle, 2013).

Table 2. Teleworkers

1998	1999	2000	2001	2002
293 000	378 000	438 000	545 000	480 000

Source: author according to (Byrne at al., 2005)

According to the latest figures from 2015 released by the Australian Bureau of Statistics, out of 11.6 million employees, 3.5 million are teleworkers, 2.6 million of these are employees, while the remaining 1.44 million are managers and business owners. Humphrys emphasizes that “42 % of those who regularly work from home cited catching up on work as the main reason. A further 20 % regularly worked from home because they wanted an office or did not want to pay rent or overheads” (ABS, 2016).

The percentage of employees who have been deemed eligible to telework has remained relatively stable in recent years. In both 2014 and 2015, 44 % of Federal employees were eligible to telework. Although telework eligibility rates have remained stable, telework participation has continued to increase steadily over time.

In 2013, Deloitte research into the demand for telework found that 74 % of people with career responsibilities not in the workforce would take up telework if it was available to them; 66 % of people with disabilities not in the workforce would take up telework if it was available to them; 70 % of people in rural and regional Australia not in the workforce would take up telework if it was available to them; 60 % of mature-aged workers would delay retirement by 6.6 years if they could telework. Based on these results, telework could add the equivalent of 25 000 full-time jobs, with 10 000 of these jobs in regional Australia, helping to grow annual GDP by \$3.2 billion by 2020–21 (Arts, 2015).

4.2 Canada

Various Statistics Canada surveys suggest a strong growth in the number and proportion of employees doing some or all of their regularly scheduled work at home during the 1990s. The number of teleworkers rose from just a little over 600 000 (6 %) in 1990 to 1 million (9 %) in 1995, 1.4 million (10 %) in 2000 to 1.32 million (9.8 %) in 2005, with the average of 17 hours per week worked at home (Akyeampong, 2007).

The data from the General Social Survey in 2008 indicate 1.75 million employees working at home (11.2 %), 1.4 percentage more than in 2005 (Turcotte, 2010). A 2013 Study notes that half (50 %) of Gen Y (this new generation born between 1979 and 1997 who are “digital natives,” i.e. the first to grow up with technology. They have common, defining characteristics in terms of social values and expectations of the work experience (O’Neill, 2009)) full-time employed Canadians are willing to sacrifice something in order to work remotely more often, compared to 28 % of those aged 30 years and older (Cukier et al., 2013).

4.3 Japan

According to a report entitled “Effort to Promote Telework in Japan” released in 2011 by the Ministry of International Affairs and Communications, in 2010 Japan was reported to have 10.9 million (16.5 %) teleworkers (proportion of teleworkers to total population of employees) compared to 2002 with 4.0 million (6.1 %). The growth is demonstrated in Table 3.

Table 3. Ratio of Teleworkers in Population (working over 8 hours per week)

2002	2005	2008	2009	2010
4.0 million	6.7 million	10.0 million	10.1 million	10.9 million
6.1 %	10.4 %	15.2 %	15.3 %	16.5 %

Source: author according to (MIC, 2011)

4.4 European Union

Statistics of European teleworking in 1998 in a few countries started to measure aspects of teleworking. The estimated total number of corporate telecommuters in 15 European Union countries (including Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland, Luxembourg, The Netherlands, Portugal, Spain, Sweden and UK) was 2 478 000 (Johnston et al., 1998).

National statistics on teleworking are not yet available, as definitions of the topic differ among EU countries. The most recent studies conducted were in 2005 and a publication in February 2010 (European Foundation for the Improvement of Living and Working Conditions), which covered the 27 EU Member States along with Norway. The highest incidence of telework in the EU27 and Norway in 2005 in percentage at least 25 % of the time or more and almost full-time was in the Czech Republic and the lowest one in Bulgaria, as depicted below in Table 4.

Table 4. Incidence of telework in the EU27 and Norway, 2005 (%)

	% involved in telework at least 25 % of the time or more	% involved in telework almost full-time
Czech Rep.	15.2	9.0
Denmark	14.4	2.6
Belgium	13.0	2.2
Latvia	12.2	1.8
Netherlands	12.0	1.9
Estonia	11.8	1.4
Finland	10.6	1.6
Poland	10.3	2.3
Norway	9.7	1.3
Sweden	9.4	0.4
Austria	8.6	3.2
United King.	8.1	2.5
Slovakia	7.2	3.4
Greece	7.2	1.4
Spain	6.9	1.5
Lithuania	6.8	0.7
Slovenia	6.7	1.9
Germany	6.7	1.2
France	5.7	1.6
Cyprus	5.7	0.0
Luxembourg	4.8	0.0
Ireland	4.2	0.5
Hungary	2.8	0.5
Romania	2.8	0.7
Italy	2.3	1.5
Portugal	1.8	0.7
Bulgaria	1.6	0.0
Malta	0.0	0.0
EU27	7.0	1.7

Source: author according to (Eurofound, 2010)

In 2000, the overall average proportion of employees involved in telework was approx. 5.3 % in the “older” 15 EU Member States (EU15) and 4.2 % in the then candidate countries. In 2005, the overall proportion had increased to 7 % for the entire EU27. Many of the countries with a high incidence of telework also experienced higher growth rates in the five-year period from 2000 to 2005. Among these countries, the percentage of teleworkers increased almost five-fold in the Czech Republic and more than doubled in Belgium, Denmark and Latvia. Conversely, a decreasing trend in terms of telework usage is evident in five countries – Bulgaria, Cyprus, Luxembourg, Portugal and Romania – while the figure for the UK appears to stagnate at an above-average level. Luxembourg is the only EU15 country in which, telework has decreased over the first five years of this decade. Above-average rates of telework are also found in the Scandinavian countries, Finland, Norway and Sweden (Eurofound, 2010)

4.5 Switzerland

The 2001–15 survey by the Swiss Federal Statistical Office reports that, during the period under review, the number of workers doing either regular or occasional home-based telework rose almost four-fold, from 248 000 to 931 000 (BFS, 2015).

It estimates that 21 % of the active labor force was involved in home-based telework in 2015, at least occasionally. However, the number of regular teleworkers (defined as those who telework more than 50 % of the time) remained modest, despite also quadrupling from 31 000 in 2001 to 120 000 in 2015. The proportion of telework varied considerably, depending on the economic sector, with the highest prevalence found in the ICTS sector, where 51.5 % of workers had teleworked at least occasionally in 2015. The second highest prevalence was in Education (45.0 %), which was also the sector with the highest proportion of regular home-based teleworkers (7.2 % of the active workforce). The ICTS sector was followed by the Professional, Scientific and Technical sectors (34.7 %) and then by Financial Services with 24.4 %, in which approx. 25 % of employees were involved in telework, both regularly and part-time.

It is important to note that the survey covered only home-based teleworkers, whether regular or occasional. The evolution in telework is particularly striking. In 2001, telework, even on an occasional basis, accounted for less than 15 % of the workforce in all sectors; by 2015, telework rates had risen to above 15 % in over half of all sectors of activity. Closely related to the greater digitization of the economy, the ICT industry showed the highest increase in teleworkers (BFS, 2016).

4.6 Latin America

Argentina, the leading country for ICTs in Latin America (third in the number of Internet users and PCs and with practically all telephone lines being digital), is experiencing a great interest in telework. The IBM company is a very good example, where out of the 1 500 employees in 2004, 700 were teleworkers, 400 being mobile workers. Attention of teleworking using ICTs has been increasing in the recent years of telework, but there are as yet no official statistics. In 2003, Carrier y Asoc. market analysts published the results of a survey on “Telecomunicaciones residenciales”. According to this survey, there are more than 320 000 homes used as electronic workplaces, i.e. 3.2 % of all homes in the country. The survey also showed that 40 % of those homes were transformed into workplaces in the last two years, while only 31.3 % have been in operation for more than five years. If this unofficial survey is confirmed, an important transformation of home into electronic workplace is currently under way in Argentina.

In 2003 in Brazil, a study of 2 000 large companies in the Sao Paulo area indicated that approximately 2 % were practicing telework. On this basis, a tentative projection of the spread of teleworking in Brazil has been attempted, with the total number of teleworkers calculated at 4–5 million, i.e. about 5 % of the

Brazilian working population. In 2003, according to Frost & Sullivan market analysts, call centers employed 500 000 agents concentrated in Sao Paulo and Rio de Janeiro, 8 % more than in 2002.

Tele-homeworking in Chile is developing, although no official statistics can be given. However, according to expert Pedro Rivadeneira, Manager of Teletrabajo tWork, approx. 300 000 Chileans are estimated to be involved in this form of work (Di Martino, 2004).

4.7 USA

USA has the leading position in telecommuting, included in many surveys listed from 2000 to 2005, as shown in Table 5.

Table 5. Survey genesis in US from 2000 to 2006

Survey	Year	Millions of workers	Definition
U. S. Census	2000	4	Worked from home most of previous week, includes salaried and self-employed
Cyber Dialogue	2000	16.3	At least once/month: 7.4M full-time workers, 4.3M part-time, 4M contract
Current Population Survey	2001	3.4	Wage and salary workers, doing some paid work at home for main job
RECS (EIA2001)	2001	3.6	Households responding “YES” to “Does anyone work on your computer at home instead of traveling to their employer’s place of business?”
American Interactive Consumer Survey	2004	44.4	“Employed Americans who performed any kind of work from home, with a frequency range from as little as 1 day/year to full time”
American Community Survey	2005	4.8	Answered “Worked at home” in response to the question “How did this person usually get to work last week?”
IDC	2005	9.1	“Worked from home 3 or more days each month during regular business hours”
WorldatWork	2006	12.4	“Regular employee who works remotely at least one day per month during business hours”

		16.2	“Self-employed individual who works remotely at least one day per month normal business hours”
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Source: author according to (Mokhtarian at al. 2004; ACS, 2006; WorldatWork, 2006, GlobalworkPlaceanalytics, 2007; Hooper 2011).

The oldest published data are from 1960 to 2000 by CENSUS, as presented in Table 6 below, listing the number of homeworkers and percentage change in a 10-year period.

Table 6. USA –Total Workers and Homeworkers: 1960 to 2000

Census Year	Number of workers worked at home	% worked at home	10-year period	% change worked at home
1960	4,662,750	7.2		
1970	2,685,144	3.5	1960 to 1970	-42.4
1980	2,179,863	2.3	1970 to 1980	-18.8
1990	3,406,025	3.0	1980 to 1990	56.2
2000	4,184,223	3.3	1990 to 2000	22.8

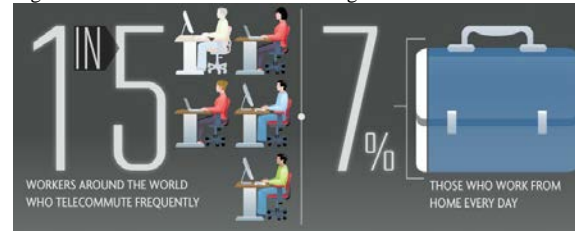
Source: author according to (Census, 2004)

The latest statistics on the work-at-home and teleworking American population are from January 2016, based on an analysis of the 2005-2015 American Community Survey (US Census Bureau) data, conducted by GlobalWorkplaceAnalytics.com. While there are no Census Bureau or government-produced data to provide additional granularity on the frequency of telework, Global Workplace Analytics’ research finds that 50 % of the US workforce holds a job that is compatible with at least partial telework and approximately 20-25 % of the workforce teleworks at some frequency. 80-90 % of the US workforce state that they would like to telework at least part-time. Two to three days a week seems to be the sweet spot to allow for a balance of concentrated work (at home) and collaborative work (at the office), Fortune 1000 companies around the globe are entirely revamping their space around the fact that employees are already mobile. Studies repeatedly show that they are not at their desk 50-60 % of the time. On average, a telecommuter is college-educated, 49 years old, and earns an annual salary of \$58 000 while working for a company with more than 100 employees. 75 % of employees who work from home earn over \$65 000 per year, putting them in the upper 80th percentile of all employees, home- or office-based (Globalworkplaceanalytics, 2017).

Regular work-at-home, among the non-self-employed population, has increased by 115 % since 2005. 3.7 million employees (2.8 % of the workforce) now work from home at least 50 % of the time. The employee population as a whole increased by 1.9 % from 2013 to 2014, while the number of employees who telecommute increased by 5.6 %.

To summarize this topic, we use the results of the survey from IPSOS about the World of Telecommuting which indicates that about 20 % of employees worldwide spend at least part of their working week doing work from home. While telecommuting is relatively common, views and practices are far from standard around the globe (Davidson, 2013). 1 in 5 employees worldwide telecommutes frequently and 7 % of employees work from home every day (Figure 1).

Figure 1. The World of Telecommuting



Source: (Howdoibecomea, 2018)

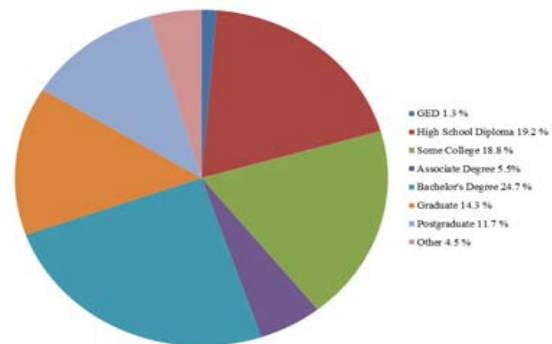
For those who do not have the opportunity to telecommute, one of the main reasons is that their employer requires them to be in their workplace e.g. in USA 38 %, Great Britain and Canada 37 %, Sweden 36 % versus Indonesia 4 %, Mexico 6 %, India 7 % and China 8 %.

While 6 out of 10 employees worldwide would be likely to telecommute full-time if their employer allowed it, opinions on the benefits of such arrangements are mixed. This type of work would help to keep 83 % more talented women in the workforce instead of leaving to raise children. 83 % of telecommuters would have less stress because of spending less time at their workplace, 78 % of them state that they would have a better work-family balance, 62 % of telecommuters state that not seeing coworkers’ face-to-face would isolate those who telecommute. Working remotely makes employees less likely to be promoted and, for some, telecommuting creates conflict by lowering the boundaries between work life and family life.

5 Results

The data used in this study were collected from October 19 to November 18, 2016 in an Internet online survey with a probability sample of 584 workers. The participants, who were randomly chosen, had jobs that required the use of ICT to accomplish their work tasks. The response rate was 52.74 %. 308 questionnaires were completed, 52 of them (8.90 %) were incomplete. In the sample, 48.1 % respondents were male and 51.9 % female, from different countries worldwide, 65.6 % of the participants were in non-management positions, 38.0 % were high school graduates or had some college education, and 56.2 % had graduated with a Bachelor’s degree or higher. More details related to education are shown in Figure 2.

Figure 2. Highest Level of Education (N=308)



Source: author’s own elaboration

Most of the respondents were from USA (21.10 %), Austria (16.88 %), the United Kingdom (13.64 %), the Czech Republic (7.47 %), Slovakia (7.14 %), Italy (5.84 %), and Germany (4.22 %). More details are shown in Table 7.

Table 7. Percentage of participants by nationality (N=308)

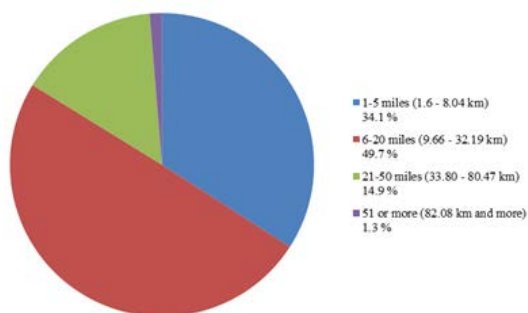
Country	%
Australia	2.27
Bosnia	0.32
Brazil	0.32
Canada	1.95

China	0.65
France	2.60
Hungary	0.65
India	0.65
Japan	2.92
Latvia	0.65
Lithuania	0.97
New Zealand	1.62
Poland	1.30
Russia	1.62
South Korea	0.32
Spain	1.30
Switzerland	2.27
The Netherlands	0.32
Turkey	0.65
Ireland	0.32

Source: author's own elaboration

In many studies, research has connected "homework" with the term "commuting to work" as an important advantage. For this reason, we also included these data in our questionnaire, where most respondents (49.7%) commute 6-20 miles to work (9.66 - 32.19 km). See Figure 3.

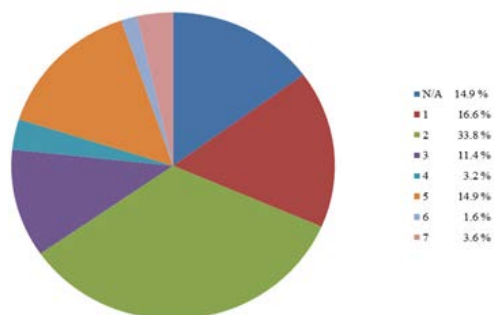
Figure 3. Commuting to work in miles (km), (N=308)



Source: author's own elaboration

Results of the survey show a clear distinction between homeworkers (32.8%) and those who do not work at home (67.2%), but we note that there is a large demand by employees to work at home (Figure 4).

Figure 4. How many days per week would you be willing to work at home? (N=308)



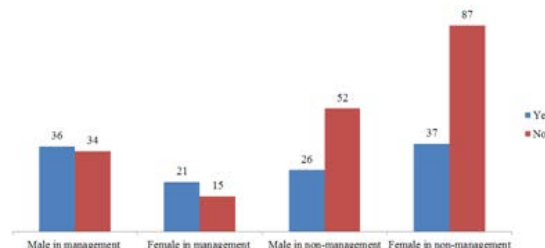
Source: author's own elaboration

Only 14.9% of respondents did not tend to choose the possibility of working at home, versus 85.1%, most of whom would prefer to work at home for 2 days per week. If we examine it from the male viewpoint, we discover that only 17.14% refuse homeworking and 82.86% tend towards it. Out of 70 respondents in management positions, most prefer to work 1 or 2 days per week at home. In non-management positions, out of 78 respondents, 14.10% reject homeworking versus 85.90% who are interested in it, preferring 1, 2 or 5 days per week. The female viewpoint is clearer, as 8.33% reject homeworking and 91.67% tend towards it. Out of 36 respondents in management positions, 1, 2 and 5 days per week are preferred. Out of 124

respondents in non-management positions, 16.13% dislike homeworking versus 83.87% who are interested in it, preferring to work mostly 1, 2, 3 and 5 days per week at home. In our opinion, the reasons that employees might have a preference for homeworking could be for a better work-life balance (e.g. time saving, flexibility, calm atmosphere), meeting family demands, not having to commute to work, financial costs, etc. However, these will be discussed in a later section.

It is evident that respondents do have a demand for remote work (under remote work, we understand work in an environment other than the employer's workplace, e.g. working from home or from another feasible environment e.g. hotel, beach, in transit, etc.). Only 39.3% of organizations offer a Home Office, versus 60.7% who do not. However, 49.7% of employees would like to have this opportunity and only 11.7% reject it. Figure 5 depicts the response by gender and between management and non-management respondents, with reference to the Home Office possibility in companies. We determine that 63.75% of females in management and non-management positions do not have the possibility of working in a Home Office, compared to 58.11% of males in management and non-management positions. As far as we are aware this result has further strengthened our confidence in missing policy of this type of work.

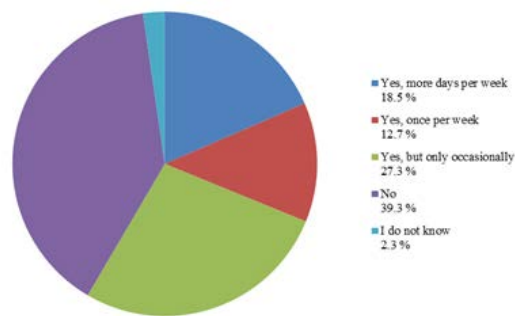
Figure 5. Home Office opportunities in organizations, number of respondents (N=308)



Source: author's own elaboration

The next topic regarding working at home provides the most remarkable result to emerge from the data is that 58.8% of the respondents practice the work whole or in part at home, where only 39.3% do not work full- or part-time at home as illustrated in Figure 6. The results indicate important evidence that in this section employees are also included who do not have a Home Office possibility. It is fundamental to note that 10.7% of the this group always take work home, 46.8% sometimes take work home, and only 17.9% never take work home. 47.7% of respondents spend 1 day per week working at home, and 28.2% spend 2 days working at home. This confirms our suggestion that the idea of working at home does not make employees feel less able to finish their work on time, as 75% of them answered this question in the negative, while only 11.4% were concerned about it. People do not want to work at home, as they have fear to not finish the work on time because of many interruptions, or depends on people's personality.

Figure 6. Do you work full- or part-time at home? (N=308)

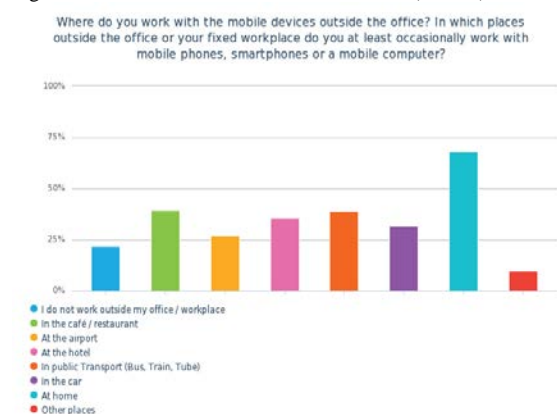


Source: author's own elaboration

Information and Communications Technologies (ICTs) are transforming not only our society and the economy, but also the way we use them in our work. These products are used by most people, ranging from mobiles, smartphones, tablets to personal computers and the World Wide Web. The more ICT is used at work, the greater flexibility and permeability will be its domain.

According to the issue of ICT utilization, we focused on the field of mobile devices outside the office, the places in which people work, which data and applications they have access to online when they are commuting to and from the office, and what professional activities they practice with electronic media on their way to work. Only 21.8% out of 308 respondents do not work outside the office and can be identified as office workers who reject any possibility of changing this situation. Out of 308 respondents, more than 68% of homeworkers use ICT devices outside the office. Further, we affirm that the utilization of ICT mostly takes place everywhere e.g. in cafés, restaurants, hotels and airports, in public transport, in cars, taxis and other venues, as shown in Figure 7. 76.6% of respondents use ICT for checking emails or Calendar, 47.4% for editing, changing or writing documents, 28.2% for using company-specific applications (programs). Most respondents use mobile devices for communication with organizations, use electronic media for phone calls, reading and writing emails. 30.2% of the total respondents use ICT for browsing the Internet, searching for contents for the company, and 24.4% for editing documents.

Figure 7. Utilization of ICT outside the office (N=308)



Source: author's own elaboration

The world's leading ICT firms (Microsoft, Apple, IBM, Oracle, Cisco) provide a unique perspective on this issue, holding tremendous promise as an enabler of social and economic progress, managing and disseminating knowledge to tap into global networks of information and services. Rapid innovations in technology are making the use of these less expensive and easier. The survey shows the unique outcome of 100% utilisation of software in our globalised world. Out of the 7 selected world-renowned software providers, most of our respondents (77.2%) use Windows OS, 62.9% are Microsoft users; 11.4% are users of Apple and 2.6% of Linux. 6.8% use other software, such as Google, ESSBASE, Online Management System, WAMAS Logistic software. This is depicted in Table 8.

Table 8. Software Utilization (N=308)

Software	Total Share in %
Windows OS	77.2
Mac OS	11.4
Linux OS	2.6
SAP	36.8
Sage	14.7
Microsoft	62.9
Social Media	14.3
Other	9.7

Source: author's own elaboration

Is working from home less problematic, more productive, or why do employees prefer to work at the office? Some people consider working from home rather problematic. One reason from our point of view could be that he/she shares their home office with pets, he/she has to take care of children while speaking to customers, which does not facilitate good communication. These were only few examples of disinterest. On the other hand, many people with young children stress that homeworking is a way of combining family and work.

Our respondents appreciate the fact that, while working at home, they are not interrupted by office gossip, noise, disliked colleagues, etc. Only a few of them miss the social interaction. Others, on the contrary, miss contact with colleagues when working from home. 239 of all respondents see the contact with colleagues as a great plus for working in the office. We think that for some people, working in the office is beneficial for the quality of work and as a counterbalance to Home Office isolation. So they prefer commuting (also part-time) to the office, so as not to miss out on the productive atmosphere and companionship of colleagues. 34.4% of respondents state that presence is very important, many things can be discussed and explained face-to-face better than at home. 131 participants prefer the separation between professional and private life.

The greatest benefits with regard to the traditional office are the skills which they can acquire in the office, e.g. behavioral and interpersonal skills (129 answers), creativity (67 answers), more experience (87 answers), and building relationships (22 answers). Respondents think that most employers reject working from home even when it is required. 15.6% of respondents think that a Home Office can lead to isolation, one works non-stop, is always on the alert (Table 9).

Table 9. Benefits of traditional office (N=308), answers

Contact with colleagues	239
Presence is important	106
Separation between professional and private life	131
Home Office leads to isolation	48
Most employers reject homeworking	48
Systematic networking	44
Time management	108
Become more experienced	87
Become creative	67
Behavioral and interpersonal skills	129
Build relationships	22
Face-to-face contact	14

Source: author's own elaboration

Our 201 respondents understand the benefit of a Home Office as being the flexibility. 100 of them think that this type of work makes work more flexible, one can focus better on work and will not be disturbed by a bustling office atmosphere (Table 10).

Table 10. Benefits of Home Office (N=308), answers

Generally better work-life balance	152
Flexibility	201
Better quality of workplace (environment, technology)	82
Home Office is the best option for not having to commute to work	99
Working from home leads to more contentment	61
Higher satisfaction with work	72
Home Office makes work more flexible	100
Home Office provides more career satisfaction	54
Time saving and time management	197
Home workers are happier and more loyal	53
Peaceful environment	25
More time for family	13

Source: author's own elaboration

The discussion about a Home Office also shows that work organization has changed during recent decades. We estimate that older people would not prefer this type of work; the idea is spreading among younger people and people of the new digital

world. The benefits of working from home are evident to homeworkers: 64.0 % think it saves time and 49.4 % that a better work-life balance can be achieved. 26.6 % mention a better quality of workplace. People working from home actually work more overtime than their colleagues who have never worked from home. The difference between work and leisure is, however, also evidently blurred for others. In their leisure time, 85 of all managerial staff deal with work calls and 70 reply to urgent emails after work. The culture of attendance that is still rooted in many companies functions in working from home. 34.4% of the participants said that attendance is important.

Work Life Balance are three words that are currently popular. In our view working from home is often celebrated as the solution to this problem. Our findings demonstrates it because 32.1 % of respondents save time on commuting, it allows a better balance between work and all other activities, as stated by 152 respondents. From our own experience of a Home Office, we are in the office a maximum of 2 days per week, when we are happy to meet other colleagues and cooperate with them. In spite of the fact that the commute is 45 minutes each way, we are no longer stressed because we do not have to do it every day. 23.4 % are more satisfied with their work, working from home makes 61 of them feel more contented and 54 of them feel more career satisfaction, 17.2 % are happier.

Working alone or from home is as expected not for everyone. Those who have to battle to meet deadlines or to avoid postponements, or who often find themselves clicking from one reference to another will not make any progress. Very likely such persons will fare much worse in a Home Office than in a real office. Self-discipline is important, with a clear determination of time constraints, as well as the care of your own biorhythm, needs and habits. Reality shows that only a few people would take working from home as a voucher for leisure and idleness. Remote working, which means being able to work from home, increases your productivity and creativity. The correct resources are essential for remote work. Email and mobile phone are alone not sufficient for homeworking.

6 Discussion and Conclusion

Evidently, those who have researched teleworking will be aware, there are numerous definitions of the phenomenon and variations concerning where to draw boundaries around this working practice. Telework has been seen as simply one form of flexible labour among others which could be clearly located within contemporary discussion of the need to develop firms which could adapt more easily to market changes. Meanwhile, telework should have been the subject of policy discussions which can inspire research to provide the public image of this form of working to show the main benefits such as reducing unemployment and the costs, saving the environment and other.

This paper has both emphasized how much diversity exists, and has indicated some main dimensions based on online survey. The first aspect is the attention given the dynamics of telework (benefits, Work Life Balance etc.) and second aspect is the very specific question of the experience of ICTs.

A global increase in alternative forms of work and employment is currently observed, entailing alternating working at home and in the main office. According to our results, the factors contributing to the rise in the number of staff working from home include the fact that employers are seeking to reduce office spaces, utility bills; technology makes it easier, more employees request some flexibility in workplaces and working hours; an increasing number of employees have the responsibilities of caring for a family; rising costs of commuting, government policies, employees and employers reporting the success of homeworking.

Technological developments have a crucial impact on the labor market. On one hand, more and better skilled professionals are needed and, on the other hand, new forms of time management and working arrangements are required. The latest requirements

concern a more flexible labor market, where people can work flexible and not fixed hours, such as early in the morning, in the evenings, at night, etc. and in different locations or spaces such as at home, in trains, buses, libraries, parks, etc. Modern ICT offers the opportunity of a high degree of working independence and, most probably, of the greater expansion of teleworking in the near future.

Mobility in the workplace is increasingly emerging. By 2015, the results from IDC research showed that the world's mobile working population reached 1.3 billion, i.e. 37.2 % of the total workforce, which is 300 million more compared to 2010 (The Rise of Mobility, 2017).

The aim of this paper is to emphasize the importance of homeworking rather than working in the office, to identify the specific advantages and disadvantages, distinguishing between them. A total of 308 individuals from many countries worldwide took part in the online survey. The interest in working at home, how the intensity of working in a Home Office affects productivity, coping with demands, communication, work-life balance, career satisfaction were analyzed.

The overall results indicate that people prefer to work at home, that a Home Office has a positive influence on the personal work experience. However, at the same time, a subgroup of 11.7 % reports no interest in homeworking. The following data suggest a part-time period of 2-3 days per week in the Home Office as a positive factor for the success of this new form of working. It is conceivable that individuals who are more open to new experiences will profit from working in the virtual world, experiencing a more flexible working arrangement, while expending less energy to adopt this new work design. Solitude may also play a significant role for highly self-disciplined persons, who are probably better able to work efficiently at home and to schedule their workday.

From both the survey's findings and the literature review, it can be stated that the Home Office business model can be observed as the new future challenge to employment. Global connectivity, smart machines, and modern media are just some of the drivers reshaping how we think about work, and the skills that we need to be productive contributors.

The Home Office business model can benefit the employee, the employer, and the new digital society. This study presents the data to substantiate that claim, provided the program is initiated correctly. We are confident that it will be a strong and valuable tool that management can use to attract and retain good employees. By retaining a workforce that has superior future potential, a company may gain the competitive advantage it needs to compete in the global marketplace. With increasing focus on quality family time and environmental concerns, homeworking provides employers the option of successfully dealing with these issues.

As far as we are aware, reducing commuting time and providing opportunities for employees to have a better work-life balance can increase employee well-being. A flexible workplace attracts and retains quality employees. Providing occasions for engagement of workers with the organization is a crucial element of working anywhere. It is important to note that organizations have to find an engaged workforce with the skills and capabilities of delivering exceptional customer service.

The management of all companies should seriously consider this alternative working arrangement, as it creates a strategy for success. We found that managers play an essential role in creating a successful homeworking environment. The majority of employees believe that their relationship with the company is based on mutual trust. However, managers should be aware of the benefits and limitations of this H.O. business model, to ensure that it provides workers and the organization with sustainable benefits while reducing the limitations.

Despite the benefits associated with homeworking, as detailed in this report, and the statistics indicating that homeworking as a flexible working practice is on the increase, we have to note that the adoption of certain flexible working practices can be quite tenuous. Our case study research initially comprised many organizations. This suggests that the adoption of homeworking may still be quite fragile in many organizations, even those publicly lauded for their successful implementation of flexible working practices.

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Primary Paper Section: A

Secondary Paper Section: AE, AH

COMBATING TERRORISM: CHALLENGES AND RESPONSES

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Abstract. To control terrorism, international community has been faced with legal problems. These problems relate to lack of universally accepted definition of terrorism, state jurisdiction, law on extradition, prosecution and punishment of terrorist offenders and use of force against state-sponsored terrorism. Peaceful measures involve ratification of international treaties to deal with various forms of terrorism. These treaties provide different provisions for arrest, prosecution, punishment and extradition of offenders. Even the enforcement system established by counter-terrorism conventions has not been successful in controlling terrorism. The use of force as a coercive means to control terrorism is not always preceded by peaceful ones. These responses do not always fulfill the preconditions laid down by international law for the use of force. To assess responses to terrorism, the doctrine of self-defense is employed as a measure of legitimacy for the use of force which established on the requirement of an armed attack under Article 51 of the UN Charter. International efforts in combating terrorism have not been much effective. In spite of the measures taken by international community in different levels, the problem is still with us and has become a major problem. This indicates the disability of international regulations and deficiency of international order.

Keywords: Counter-Terrorism Conventions, Self-Defense, Terrorism, Use of Force

1 Introduction

Terrorism is a major problem in the world today. This is not a modern phenomenon and it has afflicted human societies in different periods of history. The intensification of terrorist activities in the recent decades has made international community to take steps to find a solution for the elimination of terrorism. At the international level, international organizations have taken different legal measures to suppress this problem. They have provided a wide variety of conventions to articulate a framework for cooperative responses. Along with these measures the international community has taken coercive measures in combating terrorism. The use of force is prohibited except to be used under permission of the UN Security Council or as self-defense under certain conditions. The international Community has not been successful on both counts. This article tries to explore the challenges in combating terrorism and to offer suggestions to tackle the problem of terrorism more effectively.

2 Definition of Terrorism

There is currently no consensus regarding definition of terrorism. (Higgins, 1997: 14) Any efficient measure to prevent terrorism requires a consensus on the concept of terrorism. Attempts to reach a universally accepted definition of international terrorism has been frustrated both by changes in terrorist methodology and the lack of any precise definition of the term terrorism. However, definition is central to any international cooperation in developing the necessary machinery to suppress terrorism. It shapes states' understanding of the problem, delimits their responses to it and helps to distinguish lawful from unlawful responses. (Zeidan, 2004:491)

The nonexistence of universally accepted definition of terrorism has led to this point that a person who is terrorist to one country may be a freedom fighter to another. In 1985, for the first time, the United Nations adopted a total condemnation of terrorism in all its forms. The Resolution 40/61 of 9 December 1985 "unequivocally condemns, as criminal, all acts, methods and practices of terrorism wherever and by whoever committed, including those which jeopardize friendly relations among states and their security."

The UN Secretary General in his report on international terrorism, emphasized on the importance of articulation of the definitional components including: terror outcome (production of intense fear or anxiety); instrumental or immediate victims;

primary targets (population or broad groups); violence and political purpose (Note 1).

Although there exists no universally accepted definition of terrorism but the anti-terrorism conventions at the regional or universal levels which are dealing with a specific methods of terrorist acts are providing definition on different aspects of terrorism. The definition of terrorism is conceivable from the overlap of the anti-terrorism treaties reflected in each of the conventions. (Bassiouni, 2001:15)

3 Controlling International Terrorism through Peaceful Means

International terrorism may be controlled through peaceful or coercive measures. In using both methods, international community has confronted different problems. The problem of establishing jurisdiction over terrorist activities is one of the problems in combating international terrorism. At present there exists the International Criminal Court, yet it has no jurisdiction on terrorism. The exclusion of terrorism from the Court's jurisdiction largely resulted from inability to determine the elements of the crime. Therefore, the obligation for enforcement of international law rests upon each state. (Goldstone & Simpson, 2003: 13-14) There is no obligation upon states to extradite the offenders or to try them. The obligation of extradition arises out of an extradition treaty. Political offenders are exempted from extradition and territories of some states have become a safe haven for terrorist fugitives.

The main consequence of the legal response of the international community has been the conclusion of conventions which seek to regulate or extend criminal jurisdiction of the contracting states over different forms of terrorism. These conventions provide a legitimate basis for the international community.

The first international effort to deal with the problem occurred at the League of Nations primarily as a response to the assassination of the King of Yugoslavia which resulted in adoption of two conventions: Convention for the prevention and Punishment of Terrorism and Convention for the Establishment of an International Criminal Court in November 16, 1937 (Note 2).

After the formation of the United Nations some comprehensive attempts have been made to deal with the problem of terrorism. The result of these efforts was the conclusion of 16 anti-terrorism conventions which deal with crimes associated with terrorism, such as aircraft hijacking, crimes against internationally protected persons and hostage-taking have been adopted through the UN General Assembly, ICAO, IMO and IAEA. (Note 3)

In addition to the conventions, the UN General Assembly has passed numerous resolutions which call for cooperation against international terrorism. Though, the UN general Assembly resolutions are not binding instruments, but they have a political value of supporting the specific conventions and serve as a political reinforcement to counter terrorism conventions.

The counter-terrorism conventions which are similar in structure, define certain acts of terrorism, recognize them as international crimes and call for cooperation with other states in the prevention and suppression of stipulated crimes. They also try to establish jurisdiction upon terrorist acts. They obligate state parties in which the offenders are found either to extradite them to another state or to submit the case to its authorities for prosecution. For the purpose of extradition the offences enumerated in the conventions shall be deemed as extraditable offences and when necessary the convention shall be used as a surrogate extradition treaty.

The proliferation of legal instruments has been unable to prevent persistent acts of terrorism. This problem still prevailed in spite of all the efforts that have been made to suppress it.

1. State Jurisdiction

In the absence of an international criminal court with a jurisdiction over terrorism, it is important to determine whether states have jurisdiction to enforce domestic provisions of substantive and procedural criminal law which may be useful in dealing with crime of international terrorism.

When a state has criminal jurisdiction over an offender who is in the territory of another state, the only legal means by which a fugitive offender may be brought before the criminal court of that state is extradition. In the meantime, extradition is generally subject to an exception in the case of political offences. The extent of the exception is quite debatable. In regard to persons accused of committing offences which could be classified as acts of international terrorism, they are sometimes extradited and on other times released because it is considered that the offender has had a political motivation or it is to be feared that the accused being prosecuted for political offences. To deal with this problem and to be able to bring terrorist offenders to justice in the case of committing such crimes with political motives the anti-terrorism conventions explicitly stipulates that such crimes should be deemed as non-political for the purpose of extradition.

All of anti-terrorism conventions include provisions designed to promote efforts for prosecution and punishment of terrorist offenders. These conventions try to establish jurisdiction upon terrorist acts with an international dimension. All counter-terrorism conventions rely on the indirect enforcement system. This system is required to enforce provisions of conventions under the national law of states and to co-operate in prosecution and punishment of offenders by signatory states.

The indirect enforcement system is based on the principle of *aut dedere aut judicare*. This principle means that "contracting states on whose territory those reasonably suspected of terrorist acts happen to be must either try them or hand them over to whichever other contracting state request their extradition in accordance with treaties" (Cassese, 1989: 593). Under this principle "international crimes established by conventional or customary international law must be enforced by the national criminal laws of that state" (Bassiouni, 1983: 29)

In sum, the counter-terrorism conventions have adopted four measures to ensure that terrorist offenders do not escape trial. First, all the conventions have been based on the principle of *aut dedere aut judicare*. Secondly, when it is required, the conventions will be used as a surrogate extradition treaty. Thirdly, the offences stipulated in the conventions shall be deemed as an extraditable offence. Finally, all state parties are obliged to establish jurisdiction over offenders, even if the only basis for prosecution is the offender's presence within the state party's territory.

2. Prosecution and Punishment: State Responsibility

Extradition is a necessary but not a sufficient condition for elimination of terrorism. The principle of *aut dedere aut judicare* must apply appropriately to terrorists. When a state refuses to extradite a fugitive offender for any reason, the offender must be prosecuted by criminal court of the state. Under customary international law, states are obliged to prosecute and punish criminals within their territories.

The implementation of international obligations through effective enforcement of international law is the responsibility of states which have the duty to exercise jurisdiction for prosecution and punishment. Legal action on behalf of the international community after the commission of a serious breach of international law is only of the means to control terrorism. Punishment has to remain an element of discouragement to terrorists and should be able to help in eliminating terrorism.

Responsibility of states in prosecution and punishment of criminal offenders under customary international law has been codified in numerous multilateral conventions. The United

Nations and other international organizations have indicated the issue of state responsibility for acts of terrorism in various anti-terrorist conventions. These conventions while requiring the state to take the offender into custody to try or extradite, for ensuring successful prosecution, they impose on the contracting states a duty to "afford one another with the greatest measures of assistance in connection with the criminal proceedings". (Note 4)

The conventions relating to terrorist acts against safety of civil aviation, hostage taking, crimes against internationally protected persons, etc. impose on state parties the duty to prosecute or extradite the criminal offenders and require states to take the offenders into custody to enable criminal or extradition proceeding. The New York Convention imposes affirmative obligation upon states parties requiring them to take all practicable measures to prevent terrorist acts against acts of state, officials and diplomats.

Even the enforcement system established by counter-terrorism conventions has not been successful in controlling terrorism. This system has been collapsed by those states which are not willing to prosecute and punish the terrorist offenders.

4 Coercive Measures in Combating International Terrorism

While talking about terrorism and methods to be used in combating terrorism, one of the solutions immediately comes to mind is the use of force in response to this problem. But whether the use of force by states in their relations with other states and as a means of solving international disputes is justified? If use of force in combating terrorism is legal under international law, are there any limitations in connection with using force? As terrorist acts have increased, the use of force by victimized nations as a necessary response to terrorism has become inevitable. In taking military action, a nation confronting a terrorist threat does not formally engaged in warfare but use force to enforce international legal norms and to maintain peace and security. In regard to this subject, various forcible responses to terrorism according to the UN Charter and the rules of customary international law must be evaluated.

1. Prohibition on the Use of Force Under International Law

Classic International Law recognized the right of a state to resort to war (*jus ad bellum*) for any reason. The rules on the use of force have gradually developed during the twentieth century. This development begins from a certain limitations of the right of a state "to resort to war" in the Covenant of the League of Nations of April 28, 1919, to the universal prohibition of aggressive war "as an instrument of national policy" and "for the solution of international controversies" in the General Treaty for the Renunciation of War (Kellogg-Briand Pact) signed on August 27, 1928. (Note 5)

In 1945, the UN Charter prohibited not only aggressive war, but also any threat or use of force. From this time, the principle of refraining from the threat or use of force has been confirmed and developed in other international instruments, such as the 1970 Declaration on Principles of International Law Concerning Friendly Relations and Cooperation among States in accordance with the United Nations Charter Refraining from the Threat or Use of Force in International Relations of (Note 6), the 1974 Definition of Aggression (Note 7), the Helsinki Final Act of 1975 (Note 8), and the 1987 Declaration on Enhancing the Effectiveness of the Principle of Refraining from the Use of Force (Note 9)

The pacific settlement of disputes is a firm principle in the international legal order that is declared in Articles 2(3) and 33 of the UN Charter. The UN Charter requires the settlement of disputes by peaceful means. According to Article 2(3), "All members shall settle their international disputes by peaceful means in such a manner that international peace and security and justice, are not endangered. Article 33 requires nations involved in international disputes to first seek a solution by peaceful means. The principle of the prohibition of the threat or use of

force is stipulated in Article 2(4) of the UN Charter. Article 2(4) is a primary restriction on the use of force. It designed to ensure that international peace and security would be maintained and war would not be used as a means for conducting foreign policy (McCrede, 1986: 455-456). This Article provides that "all members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the purposes and principles of the United Nations."

International instruments such as the 1970 Declaration and the 1974 Definition of Aggression do not give an explicit answer concerning interpretation of Article 2(4). The 1970 Declaration invites states to settle their disputes in a peaceful manner. In addition, it asks them to avoid every measure involving the use of force. In this Declaration, terrorist acts directed against other states are considered as "intervention".

The decision of International Court of Justice in the *Case Concerning Military and Paramilitary Activities in and Against Nicaragua* (Note 10) has an important role in developing the non-use of force principle. In this Case the International Court of Justice has referred to activities of the United States in Nicaragua as illegal intervention. The Court decided that that the U.S. by training, arming, equipping, financing and supplying the contra-force or otherwise encouraging, supporting and aiding military and para-military activities in and against Nicaragua, has acted against Republic of Nicaragua, in breach of its obligation under customary international law not to intervene in the affairs of another state. The Court ruled that those acts of intervention which involve the use of force, against the Republic of Nicaragua are in breach of its obligations under customary international law not to use force against another state. (ibid)

In the Corfu Channel Case, (Note 11) two British warships were severely damaged during passage of the strait of Corfu, a channel located in the territorial waters of Albania. The incident also claimed the lives of seamen. The United Kingdom stated that its vessels had been exercising the right of innocent passage and was therefore entitled to compensation for damages sustained. Following the explosions of October 22nd, 1946, the U.K. without consent of the Albanian Government, did an operation to sweep mines from the territorial waters of Albania. The United Kingdom Government stated that the operation was one of the extreme urgency and that it considered itself entitled to carry it out without anybody's consent (ibid, at 32-34). In reply, International Court of Justice rejected the UK's argument and held that it "can only regard the alleged right of intervention as the manifestation of a policy of force, such as has, in the past, given rise to most serious abuses and such as cannot, whatever be the present defects in international organization, find a place in international law" (ibid at 35).

2. Self-Defense as an Exception to the General Prohibition on the Use of Force

Article 2(4) that prohibits the use of force in international relations must be interpreted in the light of other articles of the UN Charter, such as Article 1 which provides that the first purpose of the United Nations is "the maintenance of international peace and security" by taking "effective collective measures to prevent or remove threats to the peace and to suppress acts of aggression or other breaches of the peace." With regard to Article 1, it can be deducted that although using force is not allowed, however, in some cases resort to force is permitted. The expression "or in any manner inconsistent with the purpose of the United Nations" seems to imply the right of nations to use force in limited circumstances as long as they conform to accepted purposes of the Charter.(McCrede, ibid: 227-228). Despite the requirements of all nations to attempt peaceful settlement of disputes, neither Article 2(3) nor Article 33 impairs the right of self-defense under Article 51. (ibid: 225).

As to other articles of the Charter the persuade nations to solve peacefully their disputes, context of Article 51 is an exception to the general prohibition of the use of force. Professor Brownlie

has categorized the exception to the restrictions on the use of force as individual self-defense, collective self-defense and actions taken by the Security Council under Chapter VII (Brownlie, 1991: 43)

Substance of the Right of Self-Defense

Self-Defense has traditionally been regarded as a just cause of the use of force. The right of a state to defend itself is commonly believed to be an inherent attribute of sovereignty. (Paasche, 1987: 388) Grotius based this right on natural law when he said

"Self-defense derives its origin from the principle of self-defense which nature has given to every living creature..." (Bowett, 2009: 4).

The right of self-defense has gradually developed into an accepted doctrine of customary international law. To assess responses to terrorism, the doctrine of self-defense is employed as an exhortation measure of legitimacy of the use of force. (Paasche, ibid: 389).

Bowett believes that "the right of self-defense operates to protect essential rights from irreparable harm, in circumstances in which alternative means of protection are unavoidable; its function is to preserve or restore the legal *status quo*. (Bowett, ibid: 11). The right of self-defense is associated with traditional principle of just war and it legitimates the use of force to drive back aggression and restore order. (ibid). The UN Charter provides that force may only be exerted in cases of self-defense in response to armed aggression. The use of force is considered just if it is applied in a manner that is in accordance with internationally recognized standards (Nardin, 1984: 15). The just war tradition tends to be expressed in terms of outlawing aggression and defining a limited right of self-defense (Note 12).

Discussion of the customary right of self-defense must start with the classic formulation offered by US Secretary of State Daniel Webster to Great Britain's Lord Ashburton during the Caroline dispute. In 1837, a rebellion in colonial Canada was supported by American volunteers operating in the United States. The Caroline was a steamship supplying men and provisions to Canadian rebels (Bernhardt, 2014: 81). Because the rebels attacked British vessel, and British military force stormed the vessel, and two men were killed, the justification given for the raid was that of self-defense. In a diplomatic note to Britain in 1842, Webster referred to doctrine of necessity and challenged Britain's claim that its 1837 attack on the ship Caroline, on the American side of the Niagara River was legally justified because the vessel carried armed men planning to support insurrection in Canada. (Note 13) Webster denied the necessity of self-defense and wrote that the British must prove that the need for self-defense was "instant, overwhelming, leaving no choice of means and no moment for deliberation" (Jennings, ibid, Brownlie ibid: 43). Webster indicated that "the act justified by the necessity must be limited by that necessity and kept clearly within it." In addition, the right of self-defense must be directed to a specific violation of the law (Kelsen, 1948: 784). Proportionality must be accompanied by the principle of necessity. Consequently, if peaceful means are exhausted, use of force in self-defense must be proportional to the initial use of force. Caroline Case had a significant role in developing the rules of use of force in self-defense.

The writings of publicists and the practice of states based on Caroline Case established four prerequisite for legitimate use of force in self-defense. These preconditions are as follows:

1. An infringement or threatened infringement of the territorial integrity or political independence of the defending state;
2. The failure or inability of the other state to prevent the infringement;
3. The absence of alternative means to secure protection; and
4. The strict limitation of defending state's use of force to prevent danger (Bowett, ibid, 185-186).

Self-Defense and the UN Charter

The prohibition of using force expressed in Article 2(4) must always be considered in connection with the right of self-defense stipulated in Article 51 of the Charter. Article 51 of the Charter provides that “nothing in the present Charter shall impair the inherent right of individual or collective self-defense if an armed attack occurs against a member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security.”

In regard to terrorism, the debate over these provisions focused on whether terrorism constitutes an armed attack. The important question is whether Article 2(4) provides restrictions over provisions of Article 51 and to some extent the Charter is a usable guide for nations tend to respond terrorism by use of force. There are different interpretations on the scope of Article 51 and scholars have difference of opinion. Under Article 51, use of force is forbidden except in carrying out the inherent right of individual or collective self-defense if an armed attack occurs. Therefore, for self-defense by in victim states, occurrence of armed attack is essential.

Armed attack means a serious attack on the territory of a state. To evaluate as an armed attack, international law requires that terrorist acts must form a consistent pattern of violent terrorist action rather than just being isolated or scattered attacks. International interests and importance of maintaining international peace and security necessitate that states in their relations use the force as a last resort and do not use the force against every action. Thus, sporadic and minor attacks do not warrant such a serious response as the use of force in self-defense. (Cassese, *ibid*: 596)

Provisions of the Charter do not provide a clear guidance in connection with the use of force. This uncertainty has given rise to two different schools of thoughts on the scope of this right. The restrictive view asserts that “all use of force is illegal except in the exercise of the right of self-defense if an armed attack occurs. (Brownlie, *ibid*: 265) Brownlie contends that a restrictive interpretation of the provisions of the Charter regarding use of force would be more justifiable. (*Ibid*: 183)

In the Nicaragua Case, the International court of Justice did not accept the argument that the U.S. military and paramilitary activities against Nicaragua were the exercise of an inherent right of individual and collective self-defense. It confirmed that the right of self-defense existed only “in the case of an armed attack that has already occurred” (Note 10 at 70-110). It distinguished between “the most grave forms of the use of force” constituting an “armed attack” within the meaning of Article 51 of the UN Charter, and a breach of the principle of non-use of force by “lesser gravity” than an armed attack; mere frontier incidents and certain trans-border incursions do not constitute armed attack (*ibid*, at 87, 93, 103, 127) The court emphasized that “while an armed attack would give rise to an entitlement to collective self-defense, the use of force of a lesser degree could not...produce any entitlement to take collective countermeasures involving the use of force” (*ibid*, at 106). It thus rejected the broad interpretation of self-defense as well as various justifications for the use of force advanced by some writers and through practice.

The extensive interpretation of the concept of “armed attack” involves an extensive interpretation of the right of self-defense. A broad interpretation of the right to self-defense going beyond the framework of the UN Charter, with reference to the inherent or natural right of self-defense according to the customary law of the nineteenth century, must be considered incorrect. This school of thought states that the right of self-defense was left basically unchanged by the Charter (Bowett, *ibid*: 92).

The 2001 U.S Raid on Afghanistan

On September 11, 2001 terrorists conducted four attacks against targets in the United States that resulted in over 3000 civilian deaths and billions of dollars property damage. Investigations

into this horrible event did show that Al-Qaeda quartered in the Taliban controlled Afghanistan was behind the attacks.

The US position as to this event was that the hijacking of airplanes by Al Qaeda operatives and crashing them into the Twin Towers and Pentagon constituted an armed attack by Al Qaeda on the United States and that this armed attack was on a such scale as to constitute an international armed conflict.

One day after the attacks, in 12th September 2001, the UN Security Council passed Resolution 1368 in which the “horrifying terrorist attacks’ were condemned as a threat against international peace and security. It is interesting that the Council considered that a terrorist attack, not being an attack by a state, could constitute a threat to international peace and security. The Resolution is ambiguous and leaves some questions as to how the Council legally characterized the attacks of September 11. Moreover, the Council confirmed the inherent right to individual and collective and the need to combat by any means the threats to international peace and security caused by the terrorist attacks. (Note 14) The Resolution 1373 dated 28 September 2001 which adopted under Chapter 7 of the Charter reaffirmed the position of Security Council in the previous resolution. The Resolution reaffirmed the inherent right of individual and collective self-defense stipulated in Article 51 of the Charter. Since the general view has always been that only armed attacks by a state trigger the right of self-defense does this mean that the Council was now recognizing that attacks by terrorist groups are also armed attacks applicable to armed attacks by non-state actors?

The response of UN General Assembly further clouds the legal characterization of the attacks. It condemned them as “heinous acts of terrorism,” but did not describe them as attacks or invoke the right of self-defense in response (Note 15).

Article 51 of the Charter provides:

“Nothing in the present Charter shall impair the inherent right of individual or collective self-defense if an armed attack occurs against a member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security.”

The US Government justified its attack to Afghanistan as an act of self-defense by invoking to this resolution. The Resolution 1373 while confirming combating terrorism by using all available methods according to the Charter and raising its concern on expansion of extremism in all around the world is calling all states to fight against terrorism and become a member of anti-terrorism conventions.

Under Resolution 1373 and also Resolution 1624(2005), the Counter -Terrorism Committee was established with the purpose of strengthening of mechanism in combatting terrorism in the September 11 post era (Rosand, 2003: 333). The Resolution adopted after October 2001 that is after US and UK strikes into Afghanistan confirm these attacks as an act of self-defense.

The United States responded to terrorism through individual and collective self-defense. The UN charter provides for the right to self-defense in Article 51 which permits a defensive response to an armed attack. The defensive response may occur only in the case of an armed attack. Further, the Member State acting in self-defense must immediately report its actions to the Security Council. Both the US and UK complied with this requirement when they commenced the strikes into Afghanistan. The states may act in self-defense until the Security Council has taken the necessary steps to restore international peace and security. In this case, the Security Council took steps in response to the attacks, for example, by authorizing measures necessary to suppress terrorist financing and later mandating the international security assistance force deployment to Kabul. (Note 16). However, because such measures cannot completely restore peace and security, states acting in collective self-defense continue to retain the right to conduct military operations against those who committed the armed attacks of 9/11.

The first question is whether terrorist attacks may amount to an "armed attack" such that states have the right to reply in self-defense. It is instructive to recall the judgment of the International Court of Justice in the Nicaragua case. In this Case the court held that acts of violence must be of a particular "scale and effects" before amounting to an armed attack. The court distinguished acts by armed bands on a "significant scale" from border incidents and the provision of assistance to rebel groups. Acts not rising to this level might constitute a prohibited use of force under Article 2(4), but not be an armed attack justifying a forceful response.

According to International Law, at least as it stood on 10 September 2001, as a non-state, Al Qaeda could not be considered legally competent to declare war on a state, so the attacks of September 11 could not have initiated an international armed conflict (McDonald, 2002: 206-207) According to common Article 2 of the 1949 Geneva Conventions, the least that is required for an international armed conflict is two states. Article 2 provides: "...the present Convention shall apply to all cases of declared war or of any other armed conflict which may arise between two or more of the High Contracting Parties, even if the state of war is not recognized by one of them..." 1977 Additional Protocol I of the Geneva Conventions "which supplements the Geneva Conventions of 12 August 1949 for the protection of war victims, shall apply in situations referred to in Article 2 common to those Conventions." (Article 1(3)) Moreover under the UN Charter, only states are legally entitled to resort to force against other states and even then, under very restricted conditions. Al Qaeda is therefore simply not competent to launch an armed attack on a state within the meaning of the UN Charter. We have not yet reached the point in international law where armed groups or terrorists enjoy equal status with states. Characterizing the Al Qaeda terrorists' attacks as an international armed conflict also gives at least the attacks on the Pentagon some legitimacy. As the headquarters of the US armed forces, it can certainly be considered as a military objective. If this was an armed conflict, then the Al Qaeda attack on the pentagon could be legal.

If there is an armed attack, the victim state may respond in self-defense. However, any act in self-defense must meet certain requirements set forth in the 19th century Caroline case and cited approvingly by the International Court of Justice in the Nicaragua Case (Note 10) and the Nuclear Weapons advisory opinion. (Note 17) Pursuant to Caroline standard, there must be a 'necessary of self-defense, instant, overwhelming, leaving no choice of means, and no moment for deliberation' and the act must not be "unreasonable or excessive". (Note 18) Over time this standard has been construed as mandating necessity, proportionality and immediately.

5 Conclusion

Measures against terrorism have been affected by lack of any consensus upon the meaning of terrorism. It is clear that any efficacious measure in combating terrorism, without any precise definition of terrorism is doomed to failure. Meanwhile, in recent years, there is a growing commitment within the international community which unequivocally condemns, as criminal, all acts, methods and practices of terrorism whenever and by whomever committed. This position is a remarkable achievement towards the strengthening of cooperation in eliminating terrorism.

Despite absence of any consensus upon definition of terrorism, there is an agreement between states that terrorism as an inhuman act which endangers the lives and fundamental freedoms of innocents must be suppressed. In other words, while states agree on the need to combat international terrorism, they do not agree on its definition and scope.

To control terrorism, international community has been confronted with different legal problems. The problems which normally come on the way of combating international terrorism relate to state jurisdiction, law on extradition, prosecution and

punishment of terrorist offenders. The anti-terrorism conventions have tried to solve this problem by using the principle of *aut dedere aut judicare* by which member states are obliged to prosecute or extradite terrorist offenders irrespective to their motives for committing such crimes. Thus any terrorist offender committing terrorist acts with political motives can be prosecuted or extradited to other countries. In this regard a competent, impartial and independent court will play a key role in combating terrorism.

The use of coercive responses to control terrorism is not always preceded by peaceful ones. These responses do not always fulfill the preconditions laid down by international law for the use of force. To assess responses to terrorism, the doctrine of self-defense is employed as a measure of legitimacy for the use of force. States' use of force in response to international terrorism is permissible under the doctrine of self-defense which is established on the narrowest parameter: the requirement of an armed attack under Article 51 of the UN Charter. Once terrorist activities reach systematic proportions to constitute an armed attack, a state may respond to these acts with force based on the actual necessity and proportionality as established by Caroline Case. The victim states often breach the law itself under the pretense of self-defense.

The increase of terrorism has produced legal responses from the international community. The main response of the international community has been the conclusion of certain conventions which provide a legitimate basis to the international community to contain terrorism. The counter-terrorism conventions which have the similar structure, seek to regulate or extend criminal jurisdiction of the contracting states over different forms of terrorism. A key mandate of these conventions upon state parties is to extradite offenders or to submit them to its domestic court for prosecution. All of the anti-terrorist conventions are founded on the principle of *aut dedere aut judicare*. The conventions while recognize certain acts as international crimes, impose a duty upon state parties to prosecute offenders whenever extradition has not been granted and call for cooperation with other states in the prevention and suppression of such crimes. The offences enumerated in the conventions shall be deemed as extraditable offences and when it is required, the conventions shall be used as a surrogate extradition treaty. This system has a practical shortcoming. There is not a sufficient judicial assistance and other form of cooperation among states. When states refuse to execute their responsibility regarding extradition or prosecution of offenders then the legal system to deal with terrorism fails. In this regard, deciding on extradition of offenders who have committed offences with political motives may cause serious implications, even though under counter-terrorism conventions for the purpose of extradition, terrorist acts shall not be deemed as political offences. The present legal system often allows terrorists to escape from any prosecution or extradition. It is not always possible for a state to establish jurisdiction over an offender, and even when it is established, the terrorist may be able to escape from jurisdiction.

Although conclusion of the counter-terrorism conventions is an important step towards suppressing international terrorism, the proliferation of these instruments have been unable to prevent persistent acts of terrorism. There are four major problems with these treaties: (1) the usual problem that not enough states are parties to these conventions; (2) there is a lack of effective enforcement provisions, when the obligations under the conventions are frustrated by non-parties or are not fulfilled in good faith, there is no mechanism to force offender states; (3) the obligations of states parties to search for and arrest suspects are treated in an insufficient way. These obligations are crucial because the "extradite or prosecute" rule can obviously be rendered meaningless if states do not honor their obligations under the conventions; and (4) the scope of counter terrorism conventions is limited to a few terrorist acts such as hijacking or hostage-taking. International terrorism has manifested in various forms and conventions do not include all types of terrorism and to date, nations have not reached an agreement upon a

comprehensive means for solving the problem, through a single unified document.

International efforts in combating terrorism have not been much effective. In spite of the measures taken by international community in different levels, the problem is still with us and has become a major problem. This indicates the disability of international regulations and deficiency of international order.

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Note 2. For detail see L.M.Bloomfield and G.F.FitzGerald, *Crimes against Internationally protected Persons: Prevention and Punishment, An Analysis of the UN Convention*, Praeger Publisher, 1975, p.2

Note 3. www.un.org/Doc/SC/Comments/1373

Note 4. See the Hostages Convention, Art. 11; the Hague Convention, Art. 11; and the Montreal Convention, Art. 13

Note 5. League of Nations, Treaty Series, vol. XCIV, p. 57

Note 6. UN GA Res 2625, 25 UN GAOR, Supp. (No. 28), at 121, UN Doc. A/8028(1971)

Note 7. UN GA Res. 3314(XXIX) of 14 December 1974

Note 8. 14 ILM 1292 (1975)

Note 9. UN GA. Res. 22(XLII)

Note 10. Case Concerning Military and Paramilitary Activities in and Against Nicaragua (Nicaragua v. U.S) 1986 ICJ Rep. pp. 70-110

Note 11. Corfu Channel Case (UK v. Albania) 1949 ICJ Rep, p.4

Note 12. UN Charter, Arts, 2(4) and 51

Note 13. For details of the Caroline incident see R. Y. Jennings, "The Caroline and McLeod Cases," 32 AJIL 82 (1938); Schachter, "The Right of States to Use Armed Force," 72 MichLR 1635(1985)

Note 14. Sec Res 1368, ILM, 2001: 1277

Note 15. UN GA Resolution 56/1, 18 September 2001

Note 16. S.C Res. 1373(Sept. 28, 2001); S.C.Res.1386 (Dec. 20, 2001)

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Primary Paper Section: A

Secondary Paper Section: AD

TAX OPTIMIZATION OF INTANGIBLE ASSETS IN THE CZECH ENVIRONMENT

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This article was written as one of the outputs of support from the project of Excellent Research called „New Approaches to the Reporting of Intangible Assets in the Czech Republic“ that is being continuously implemented at the Faculty of Economics of the Technical University in Liberec within the years 2018 - 2019.

Abstract: The aim of the article is to investigate the growing importance of intangible assets in the context of tax optimization in the Czech environment. The development of tax legislation regulating the substance of intangible assets and their depreciation is also analysed. There are discussed ways of tax optimization when transferring rights to this property. From the methodological point of view, the methods of synthesis, comparative analysis, induction and deduction were used in this work. From the research presented, it is clear that the tax regulation of intangible assets has undergone a long-term development. The Czech tax legislation reflects the initiatives of international communities aimed at reducing non-standard tax transactions related to intangible assets.

Key words: Aggressive tax planning, depreciation of intangible assets, double taxation agreements, IFRS, intangible assets, market distancing principle, transfer pricing.

1 Introduction

Intangibles form an important part of the company's assets. Since the early 1990s, the importance of these assets has been growing in a company management. In the so-called knowledge economy, sub-components of intangible assets such as knowledge, software, business secrets, copyrights and patents or customer relationships are an important part of corporate assets and make a significant contribution to the company's competitiveness. The structure of corporate assets shows a shift away from tangible assets towards intangible assets. This trend brings new problems and challenges. The aspects of displaying intangible assets in the accounting system and the potential of possible tax optimization are examined. The accounting legislation of the Czech Republic is currently developing in the field of intangible assets towards the provisions of international accounting standards. In the tax area, new possibilities for tax optimization of intangible assets are sought not only at national but also at international level. Thanks to their non-material nature, intangible assets are an attractive tool for broad tax optimization. Companies in the international environment use gaps and inconsistencies in the tax legislation of individual jurisdictions to reduce tax bases, or in other words optimization of the tax liability. The aggressive tax planning of companies, especially of transnational holding structures, causes unequal access to corporate taxation and disturbs the competitive market environment.

The tax legislation of the Czech Republic regulating the intangible assets sector has evolved over the years mainly in the area of intangible assets, the amount of the valuation and the possibility of depreciation as an item reducing the tax base. At present, it is clear that even in the Czech environment, the importance of intangible assets in corporate practice is growing. For this reason, the increased attention is paid to tax optimization of this property not only at national level, but also in the international environment.

2 Materials and methods

In recent years, intangible assets have gained an irreplaceable significance in the ownership structure of companies (Su, 2015). Intangible assets are perceived as key factors in the success of companies in a competitive environment (Bontempi, 2016). Intangible assets are also used as a tax optimization tool when calculating corporate tax. There are a number of works demonstrating the desire to use intangible assets in international tax planning (e.g. Ginevra, 2017). Some international tax planning methods are quite controversial and the OECD ranks them in the area of so-called aggressive tax planning (OECD 2013). Both the OECD and the EU are under pressure to reduce

or eliminate these unfair practices that distort the competitive environment. In 2015, the BEPS (Base Erosion and Profit Shifting) initiative was established. In this initiative, the OECD identifies 15 Actions to help countries fight large-scale tax evasion and move taxes into jurisdictions with a more favourable tax regime (OECD/G20 2015). Actions 8-10 deal with transfer pricing (OECD 2017). This is closely related to the issue of intangibles. There is no reliable data on the substance, valuation, and usability of the transfer of rights to intangibles between associated companies. This opens up room for potential tax evasion. The tax administration does not have sufficient information to assess whether the rights to intangible assets have been transferred to a low value or overvalue compared to arm's length price (Alstadsæter, 2018).

Also, in the Czech Republic, in recent years accounting and tax aspects of intangible assets have been given a great deal of attention (Malikova, 2016). The importance of intangible assets for business management is examined (Drabkova, 2015) and relevant tax consequences are analysed (Lengenzova, 2017). In Czech accounting legislation, intangible assets are adjusted, inter alia, by Czech Accounting Standard No. 013 (ÚZ 2016). Intangible fixed assets include, inter alia, intangible assets, software, valuation rights, goodwill, emission allowances and preferential limits (longer than one year). Czech accounting legislation defines the methods of acquisition, valuation and depreciation of these assets. The use of intangible assets is recognized as an expense in the income statement in the form of depreciation and / or payment for the use of a certain type of this asset. In the field of revenues, on the other hand, invoices or revenues for the rights to use intangible assets are recorded (ÚZ 2016).

In recent years, national accounting legislation on intangible assets has been brought closer to the concept of intangible assets under International Financial Reporting Standards (further IFRS) (Strouhal, 2012). Intangible assets are addressed in particular in IAS 38. According to IFRS, intangible assets are identifiable non-monetary assets without physical substance. IAS 38 also provides examples of intangible assets. These are usually computer programs, patents, copyrights, movies, customer lists, customer or supplier relationships, market share, and marketing rights. In order for an IFRS item to be recognized as an intangible asset, it must meet the definition of an intangible asset (the asset must be clearly identified, the cost of the asset is reliably measurable, the asset is controlled by the entity, and there is a presumption of future economic benefits from that asset). The time of use of an intangible asset is also important. Each entity assesses whether the useful life of the asset is final or indefinite. In the case of an indefinite useful life, it is not possible to precisely determine the period for which the asset will bring the entity's future economic benefits. From this, the depreciation method is drawn (or intangible assets with indefinite useful lives are not depreciated, they are only annually tested for impairment of the asset) (IAS 38). In the Czech Republic, the tax aspects of intangible assets arise from the provisions of the Income Tax Act. The tax rules regulate the depreciation of these assets as well as the costs (or revenues) associated with the use of intangible assets (Zákon č. 586/1992).

In the context of the research activities of the project, the tax aspects of intangible assets in the Czech Republic are discussed in this paper. Primarily, the attention is paid to national legislation on income tax. A comparative analysis of the historical development of the partial provisions of the Income Tax Act, dealing with intangible assets or its depreciation options, was carried out. Using the statistics of the Ministry of Finance of the Czech Republic (providing selected information from tax collection in individual years), an analysis of trends in utilization of depreciation of intangible assets as a tax optimization tool was performed. In connection with the use of intangible assets, the partial provisions of the Income Tax Act

were synthesized and subsequently confronted with international legislative standards.

3 Results

The possibilities of tax optimization of intangible assets have historically depended on the basic characteristics of these assets, in particular their substance, valuation and method of calculating tax depreciation. For the purpose of calculating the tax base, or the tax duty of the company, it was always required to proceed according to the partial provisions of Act No. 586/1992 Coll., on Income Tax. Intangible property legislation has undergone a long-term development in this legal standard (just like the law that has been revised almost 160 times). At present, the regulation of intangible assets and depreciation is devoted to the provisions of §32a. The historical development of the tax treatment of these assets (basic characteristics, depreciation method, and entry price) is analysed in table 1 below.

Table 1 Development of the position of intangible assets in the Income Tax Act in the Czech Republic

Period	Characteristics	Depreciation methods	Entry price for depreciation
1993 – 1995	Subjects of industrial property rights; projects and software; other technical or other economically viable knowledge; acquisition costs.	as long-term tangible assets within depreciation groups	> CZK 20,000
1996 – 1998	Subjects of industrial property rights; projects and software; other technical or other economically viable knowledge; acquisition costs.	ditto	> CZK 40,000 > CZK 20,000
1999 – 2000	Subjects of industrial property rights; projects and software; other technical or other economically viable knowledge; acquisition costs.	ditto	> CZK 60,000
2001 – 2003	was not defined in the Income Tax Act	only accounting adjustment.	> CZK 60,000
2004 – present	Intangible R & D results, software, valuable rights, and other assets that are held in accounting as intangible assets designated in accordance with accounting policies.	Entry price/ usage period audio-visual work for 18 months; SW, science and research results 36 months, other intangible assets 72 months	

Source: author's own processing in accordance with the Income Tax Act in individual years of effectiveness

Since the date the Income Tax Act came into effect, the "long-term" of intangible assets has been accentuated by a requirement for operational technical functions (later the useful life) longer than one year. At the beginning of the new tax law, the limit for the classification of assets in the intangible assets category was set at CZK 20,000. Subsequently, by the end of 1998, the valuation limit in the act was set at CZK 40,000, and since 1999, the entry value of intangible assets has been set at CZK 60,000. In the past, the limit for classifying acquisition costs in the category of intangible assets was lower. Since 2016 they have been accounted only in costs. Until 2000 inclusive, intangible, as well as tangible assets, were classified into depreciation groups for depreciation purposes. It was depreciated in equal measure with the tangible property (evenly or accelerated).

During 2001 to 2003 intangible assets in the Income Tax Act were not defined. It was only defined by accounting regulations. It was depreciated only according to the accounting plan, mandatory from the valuation of CZK 60,000. The depreciation period has not been defined (except for the limitation of the depreciation period of 5 years for the establishment costs). Accounting depreciation was tax-deductible and reflected in the corporate tax base. Since 2004 the nature of intangible assets has been adjusted, as well as a change in the depreciation method.

Assets in which the right of use is defined for a definite period of time are depreciated on a straight-line basis (calculated as the share of the input price and the period of use agreed upon by the contract). In the case of other assets, amortization is currently used (unless a specific time is agreed upon). From 2017, it is possible to apply these depreciations for longer (at least 18, 36 and 72 months respectively). In 2018, "research" was excluded from the "Intangible R & D Results" in line with IFRS. The reason is that the intangible results of the research do not meet the recognition criteria for long-term intangible assets under IAS 38 (research expenditure as of 1 January 2018 is recognized only in costs when incurred).

As the knowledge economy increases, the share of companies that rely on intangible assets and innovations in their activities is also growing (Boronos, 2016). The share of intangible assets in the total assets of these companies is going up (EU 2017). This trend is supported by the Industry 4.0 call. Applied research, digitization and automation are key attributes of the future development of business activities in the context of this call. The trend of increasing representation of intangible assets in the structure of company assets is also reflected in the increase in the tax depreciation of this asset. The following figure 1 compares the development of the tax depreciation of intangible assets with the increase in the number of tax subjects.

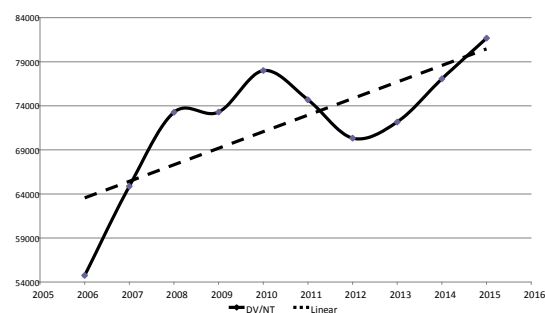


Figure 1 The development of the share of the depreciation value (DV) of the intangible assets on the total number of tax subjects (NT)

Source: author's own processing

The initial data for the processing the trend was obtained from statistics of the Ministry of Finance of the Czech Republic. Information on the development of the number of tax subjects (commercial corporations) was investigated and data reflecting the growth in value of tax depreciation of intangible assets were analyzed. For the relevance of the data used, the period between 2004 and 2015 was chosen. In 2004, the tax legislation on depreciation of intangible assets (a separate category of depreciation of intangible assets) amended. This amendment is still valid today. The time series is limited to 2015 as data for the next period are not yet available. The figure shows that the linear trend reflecting the development of tax deductible depreciation (in relation to the growing number of tax subjects) confirms the thesis of the growing importance of intangible assets in the assets of companies.

The growing representation of intangible assets in the property structure of companies also generates new challenges for tax systems. Originally, taxes on these activities were levied on the basis of the legal ownership and physical location of a particular intangible asset. At present, the situation is much more complicated. Companies create complex tax structures that allow for sophisticated tax optimization in the field of intangible assets, when used. A healthy market needs a fair and efficient system of corporate tax collection, though. The underlying assumption is that businesses pay taxes in the country in which they make their profits (Dover, 2015). However, the aggressive tax planning of some multinational companies ignores this principle. This is detrimental to fair competition and, in accordance with Lawless, (2018), it is particularly maltreated by SMEs.

Multinational companies use the specifics of national tax systems for dealing with intangible assets. An intangible asset is owned by a member of a holding structure located in a tax-favorable jurisdiction (a country with a low tax rate or an appropriate approach to taxing intangible assets) and provides this asset to other members of the holding in different countries. Revenue from this transaction is not taxed by the owner of the intangible asset at all or at minimum (according to the chosen jurisdiction). The members of the holding then reflect the payments for the provided intangible assets in the costs. Thanks to this transaction, corporate profits are shifted to a country with a zero or moderate corporate tax rate. Both the OECD and the EU seek to reduce the impact of this aggressive tax planning (Collier, 2017). Both binding directives and recommendations are implemented by individual states in their national tax laws. In the Czech Republic, the above issues are addressed by the Income Tax Act. The tax regulation of intangible assets in the Czech Republic is analyzed in the context of royalty fees (see Table 2). Transactions associated with royalties are a frequent tool for tax optimization.

Table 2 Tax treatment of expenses and income from transactions with royalty fees in the Czech Republic

Income from royalty fees	Expenses associated with the use of royalties
Exemption from License Income (S.19 (1) (zj) (ITA))	Expenditure evaluation based on market access principle (S. 23 (7) (7) ITA)
Withholding tax on income from licenses (S. 36 (1) (a) (c) ITA)	
Act No. 92/2017 Coll. on international cooperation	

Source: author's own processing

Czech tax legislation on licensing is based on the OECD and the EU initiatives (recommendations or guidelines). As of 1 May 2004, Council Directive 2003/49 / EC on a common system of taxation of interest and royalties between affiliated companies of different member states was implemented in the Income Tax Act (hereinafter "ITA"). The aim was to ensure a uniform approach for residents and non-residents, as well as to tax the payment of interest and royalties only in one member state (exclusion of double taxation).

In the Income Tax Act, the exemption of royalties in connection with the above-mentioned Directive is dealt with in Section 19 (1) (zj). This exemption relates to royalties from a company resident in another EU Member State, Switzerland, Norway from a commercial corporation that is a tax resident of the Czech Republic. The possibility of liberation is fulfilled under certain conditions. The basic condition is to carry out a transaction between the so-called capital-linked persons (the share represents at least 25% of the registered capital) and the second condition is that the beneficiary must be the real owner of this license. The exemption is made by decision of the tax administrator. The taxpayer must apply for this decision.

Unless the taxpayer fulfills the conditions for exemption, his income from royalties is taxed with a 15% of withholding tax (Section 36 (1) (a) of the ITA). Withholding tax can be subsequently calculated, under certain conditions, for the tax liability established on the basis of the tax return (submitted in the Czech Republic). In case the taxpayer comes from a state which has concluded a double taxation treaty with the Czech Republic, the provisions of this contract related to royalties prevail over the national regulation. Typically, the withholding tax on royalties in these contracts varies between 5-10%. However, if the taxpayer is not a resident of the EU or of the European Economic Area and the Czech Republic does not have a double taxation treaty with the taxpayer (or an international agreement on the exchange of information in tax matters), the withholding tax is 35% (Section 36, (1) (c), ITA). Assessing the relevance of the costs associated with the use of the license (or royalties) is rather complicated. The intangible nature of the licenses granted and the difficulty to identify properties (form of transaction, degree of protection, assumption of profit from the use of assets) form the basis for targeted tax optimization (in the sense of overestimating the licenses granted), especially among

related parties (members of holdings). The OECD Transfer Pricing Directives (OECD, 2017) seek to prevent these unfair practices. In line with the principle of market separation, the same relationship should be established between related parties as between unrelated parties. In Czech tax legislation, the requirements of the Directive are implemented by provisions (Section 23 (7) of the ITA). In this sub-clause of the Act, the basic rule for transfer prices is laid down and also the related persons (not only capital-linked, but also persons of close or otherwise connected persons) are also defined.

The pressure of international communities to eliminate problematic tax practices has grown heavily in recent years. Besides legislative regulation of taxpayers' behavior, tools for fighting tax administrations against aggressive tax practices of holdings are also necessary to implement in the legislative environment. Act No. 92/2017 should help limit aggressive tax planning damaging national budgets. The essence of this law is the possibility of an international exchange of information not only on certain transactions but also on tax opinions of individual control authorities and the possibility of comparing the so-called usual prices in different countries. This should complicate licensing agreements that make it possible to export business profits to foreign countries. Earned business profits would thus strengthen the state budget in the country where the business operates. The mode of taxation of income (or expense) from licenses in the Czech environment and its impact on the state budget is synthesized in Table 3.

Table 3 Effect of the tax solution of revenues and expenses from license fees on the state budget of the Czech Republic

License provider	Taxation of income from royalties by withholding tax	Claiming fees for royalties in the Czech tax base	Influence on the revenue side of the state budget
EU residents (capital-linked persons)	exempt	in full (tax savings of 19%)	- 19%
CR non-residents, without contracts	35%	in full (tax savings of 19%)	+ 16%
CR non-residents, concluded contracts	5 -10%	in full (tax savings of 19%)	- 14%; - 9%

Source: author's own processing

The table shows the impact of the tax levy of royalties on the revenues of the Czech state budget. In the event that royalties are paid to an EU resident (subject to the capital-linked persons), the proceeds of the transaction are exempt. The expenses associated with payment for licenses are reflected in the tax base of a domestic taxpayer. This creates a tax saving of 19% for the company. This amount will not be paid to the SR (for the SR there is a "loss"). In the situation when the license fees are collected by an EU non-resident (which does not have a double taxation treaty with the Czech Republic or an exchange of information agreement), this income is taxed at a rate of 35%. Compared to taxpayers' tax savings (from license fees), the revenue of the state budget represents only the difference between the withholding tax and the tax saving that is 16%. In the situation when the income from the license fee flows to the company from the state with which the Czech Republic has concluded contracts (Double Taxation Avoidance Agreement, Agreement on the Exchange of Information), the "loss" of SR is 14, or 9% (depending on the amount of withholding tax on royalties under individual contracts). From the above, it is obvious that it is important for tax administrations to monitor not only the regime of taxing income from licenses but also the relevance of license fees and their application in the tax base. O legislative standards.

4 Discussion

Project research activities in the field of intangible assets focused primarily on the issue of Czech accounting and tax legislation. There are obvious trends in the accounting and tax area in approximating national legislation towards international regulation. Amendments to accounting legislation reflect the

provisions of IFRS regulating the substance of intangible assets, their useful lives and, subsequently, their depreciation. There are a number of expert works demonstrating the growing share of intangible assets in the structure of corporate assets and their importance for successful company management. With the growing importance of intangible assets, space for broad tax optimization is expanding. Trend analysis of depreciation utilization development as a tool for tax optimization confirms these facts. The tax legislation on intangible assets and the method of depreciation has undergone relatively dynamic developments. Since 2004, the basic attributes of intangible assets have stabilized from the point of view of income tax. However, tax optimization is not only related to depreciation. Holding structures transfer rights to intangible assets between affiliates in different countries to optimize their tax liability very effectively. These practices of aggressive tax planning are currently facing major criticism and regulation by the OECD and the EU. The article examines sources of Czech law related to transactions with intangible assets, or in other words to grant licenses. Czech tax legislation regulates both the taxation of income from licenses and the fees for royalties. Different regimes of licensing taxes are to a different extent reflected in the revenues of the state budget of the Czech Republic. In the next period, the research activities of the project will focus on the issue of intangible assets in the international environment and wider possibilities of regulation of transnational tax optimization.

5 Conclusion

The use of intangible assets and their tax optimization is currently a highly debated issue in the international economic environment. The OECD and the EU initiatives actively stand up against the practices of complex holding structures that purposefully transfer profits from one country and move them to favorable tax destinations. This aggressive tax planning is based on several key attributes. An intangible asset is an important tool in this process. The principle of tax optimization is the transfer of rights to intangible assets (e.g., transfer of royalties) between related companies operating within holding structures in countries with different tax regimes. This situation distorts the competitive equilibrium of the market, creates room for huge tax evasion and damages primarily small and medium-sized enterprises. These companies cannot, by their very nature, create complicated tax structures and tax fairly on income in the country in which they operate. In recent years, the pressure of the international community on the transparency and fairness of transnational transactions has grown. The backbone of this process are legislative norms that should eliminate or mitigate problematic tax transactions. The EU countries adopt the necessary measures in their tax legislation and national tax administrations communicate and exchange the necessary information on tax procedures. It is in the interest of all developed countries to limit or eliminate the above practices. The tax on business profits then remains in the jurisdiction in which it was generated.

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Primary Paper Section: A

Secondary Paper Section: AE

TEXT, COMPREHENSION AND INTERPRETATION OF THE TEXT

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This article was drawn up within the project of the Grant Fund of the Dean of the Faculty of Education, Palacký University, named Autoregulation of learning during production of text carried out by pupils of the upper elementary school.

Abstract: Presented theoretical study deals with problems of text, its understanding and interpretation. These basic terms are characterized from different points of view and we point out its function that represents important role during development of reader's literacy. When defining the understanding of a text we aim at the all-round understanding, different kinds of text and understanding of literary texts. We also study text interpretation, which is an essential requirement for work with text and it is one of the tools used for uncovering of understanding.

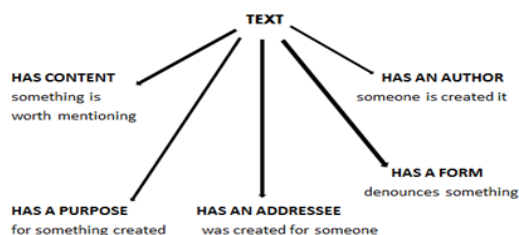
Keywords: text, different kinds of text, text characteristics, understanding of text, text interpretation

1 Introduction to research study, text and text characteristics

The main goal of this study is to introduce problems of text, basic kinds of texts, to point out basic text characteristics, to focus on the relationship between text understanding and interpretation and factual or artistic nature. Theoretical part is divided into three chapters. The first chapter concerns with origins and meaning of the word „text“, which represents basic subject of this study – it serves as a tool for education, recognition of a surrounding world, but also as a possibility of self-fulfilment. This part consists of basic text characteristics and determination of text typology based on two different point of views. Another essential topic of this study is problems of text understanding and its development, which is very discussed question. We define and enlighten process of understanding within the connection to activation of existing skills of text reception. In the last part of the study we focus on interpretation and relationship to the text understanding. We aim at the interpretation based on the variability of the functional aspect, that means literary-scientific, literary-educational and interpretation in detailed view.

We also pay attention to interpretation activities, and interpretation competences. Word „text“ nowadays has a lot of definitions. Our goal is not to introduce and analyse different text definitions, therefore we chose only one definition. Word „text“ comes from Latin word *texte/textere*, which can be translated as textile material and in the past, it was understood as a unit woven by speech (Mihálechová, In Gavora, 2008). „Student acquires big part of information through the written text. He/she reads popular-scientific literature, newspapers and magazines. Student uses guidelines, encyclopaedias and dictionaries. We can say that written text plays very important role in the universal development of the student“ (Gavora, 1991, p. 10). School's task is not only to teach the student how to acquire formal parameters of reading techniques, but mainly to teach him/her how to understand and fully interpret concrete text. According to the following scheme, we can say the text:

Scheme 1 Content structure of a text



Source Mihálechová, In Gavora, 2008, p. 9

Main function of the text is to transfer information and to fulfil concrete communication purpose. Text is formed by words, sentences, phrases, not accidentally, but based on the rules of the particular language. Text can have form of coherent notation (text formed by symbols, signs, numbers, characters, words), but it can also have audio form, played form or animated form. Regardless of the form of the text, it usually has an author, content, form, purpose and recipient (Mihálechová, In Gavora, 2008). „Text represents specific object and textuality is a special feature. All parts of the text conforms to the communication purpose. Its goal can be awareness, change of the recipient's opinion, motivation to perform some activity etc.“ (Gavora, 1991, p. 12). Awareness is considered to be one of the basic text characteristics. Other characteristics that are fulfilled by the text are cohesivity, coherence, acceptability, situationality, intertextuality. From the view of textual linguistics, language unit has to fulfil certain criteria to function as a text. Robert de Beaugrande (In Klimovič, 2009, p. 12) defines seven standards of textuality (essential properties of texts):

- language standards: coherence, cohesion;
- psychological standards: intentionality, acceptability;
- social standards: situationality, intertextuality;
- communication standards: informativity.

These standards will now be briefly discussed in relation to textbooks. „Coherence is related to the referential aspect of the content structure of a text. Text units are coherent if they convey information“ (Dolník & Bajžíková, 1998, p. 15). Coherence refers to the thematic connectedness of a text which enables the reader to easily identify the topics and relationships between them. Cohesion refers to the internal connectedness of a text. Cohesion facilitates the reader's orientation in the text as well as reading comprehension.

„Cohesive means can be identified by looking at how a sentence in a text connects to the previous sentence“ (Mareš, In Čáp, Mareš, 2001, p. 486). The intentionality of a text is related to the ways in which the text serves the goals of the author, how it expresses the author's intentions and purpose. The intentionality of an educational material is apparent in the careful selection of information verified through research as being appropriate for students of a certain age, education and perceptive skills. The intention is to convey to the students the body of knowledge, relationships and procedures that they will need to succeed in a particular subject or else to integrate knowledge from several content areas, to encourage the students to internalise certain values and attitudes and, lastly, to teach them how to work with texts and develop their competence to learn how to learn. All this should contribute to the students' personal development (Mareš, In Čáp, Mareš, 2001).

Informativity refers to thematic and functional unity. Another text characteristics are text acceptability for recipient and implementation of the text to a situation – situationality (its contextual relevancy). A text is informative if it provides new information to the recipient.

After reading the text, the reader's (recipient's) level of information saturation should increase. The requirement that texts should be readable means that they should be structured in a way that makes it simple for recipients to perceive and understand them. This requirement is based on the principles of logicity, lucidity and economy. The principle of logicity dictates that the content of a text should be segmented into utterances, which should be arranged in a certain hierarchy. The principle of lucidity translates into the effort to achieve as great a correspondence between the content and form of a text as possible. The principle of economy refers to the need to convey information quickly and intelligibly. Situationality refers to the relationship of a text to the situation of occurrence.

Intertextuality covers the relationships of a text to other texts (Hoffmannová, 1997; Slančová, 2001). "Intertextuality refers to the process of establishing connections between the students' existing knowledge and new information presented through texts" (Mareš, In Čáp, Mareš, 2001, p. 486). Intertextuality covers relationships between various text types used in the context of one content area (textbook, reader, a mathematics exercise book, study guide, etc.) and relationships between texts used across several content areas.

„Text is a relatively self-contained unit of communication which has content, illocutionary structure and propositional and pragmatic function" (Dolník & Bajzlková, 1998, p. 10). „Structure of the text contains content structure that is motivated by a proposition function and illocutionary, which is connected to a pragmatic function" (Dolník & Bajzlková, 1998, p. 13).

1.1 Basic kinds of text

Mistrík (1997) divides texts into factual and artistic. Function of the factual texts is to inform the recipient. These can be divided into journalistic, expert and educational, administrative-judicial texts. The main function of the artistic texts is an aesthetical function, evoking of aesthetical experience (feelings, moods etc.). Based on the elaboration we can distinguish prose, poetry and drama. Such dividing (factual texts, artistic texts) can be considered as theoretical, there is no clear boundary between them, we cannot put them into one clear group of texts only. There are also so-called personal kinds of texts (they are based on the moment of social participation of the recipient). Among these, Mistrík assigns (1997) essay, non-fiction and science-fiction texts. Further literature for women (typically „women" literature, like recipes, patterns, women novels and others). Literature for men also belongs to this group (sport news, texts with hunting themes etc.). To this kind of text, we can also assign typical „children" texts (children magazines, books for children), and typically „teenage" texts (magazines and books for teenagers).

„Early school metatext (or text) is modelled according to the requirements of school literary education, based on the recipients' age variability and reading effectivity. Optimally, it is focused on ideological-aesthetical experience of the reader's reception" (Jurčo & Obert, 1984, p. 27).

Ordinary forms of texts are so-called connecting texts that represent brief reproduction of skipped unit before the extract or behind him and they deliver necessary information relating to the context of the whole piece. To this group we also assign so-called supplemental texts explaining unknown words (archaic, foreign words, expert expressions, translations etc.). Among the school metatexts we can talk about biography, which is represented by five areas – author's biography, biography of a book, biography in a book, author's autobiography and autobiography of the book. All of these formal kinds of metatexts are called general term complementary informative texts (Jurčo & Obert, 1984).

Other kinds of complementary texts are (Jurčo & Obert, 1984):

- Paraphrastic texts.
- Didactic texts (didactic instructional texts, didactic receptive texts, didactic situational texts).

Paraphrastic texts provide secondary information about the original text (its graphic, musical, theatrical, radio, movie processing). Between didactical-instructive texts we can also find didactical tasks and questions, lessons from literary theory, history and critics, summarized knowledge about literature and biographical-bibliographical data. Deepening of the perception of the literary work based on the reproductive, conceptual, explicative and discussion approach it has didactic text. Didactical situational texts represent incentive educational influences on the cultural, social life and the development of personality.

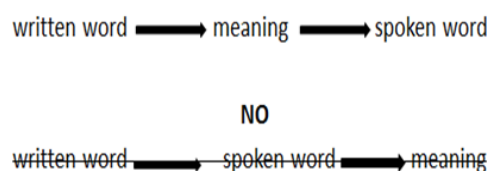
2 Understanding and reception of text

„Understanding to a text is a basic human activity and we cannot imagine human's life without this activity. Every human tries at every moment to understand what is happening around him or inside himself. He/she tries to find out what is the purpose, importance of every situation in his/her life – it means to understand it. There are only few activities requiring pure mechanical activity without understanding – there is always at least some minimum understanding" (Gavora, 2008, p. 51).

„Comprehension is synonym to understanding. Understanding is based on knowledge about world and number of cognitive abilities and skills"(Gavora, 2008, p. 51). There are more cognitive skills and abilities being involved in the process of understanding. We can understand understanding as an activity, but also as a result of understanding (it means product of this activity) – more detailed description has to be used for their distinction (Gavora, 2008).

„Understanding of written text is one of the ways how to acquire information about the world. Human also understands to verbal expressions, pictures, movement and complex situations (e.g. breakfast, fire, wedding). Text is specific case, because it brings information expressed by written verbal means that are organized through a specific way, which is called text structure" (Gavora, 2008, p. 52).

Scheme 2 Relationship between vocal reading and understanding of text of adult reader



Source Smith, In Gavora 2008, p. 53

Zelinková (2001) divides process of understanding into three source levels, namely:

- lowest level, understanding to isolated words, simple sentences – typical for beginning reader (other activity is pairing of words, see the picture above);
- higher level, where perception and remembering of the text is mechanical, without logical context – students are not able to perform deeper text analysis (typical for the first grade of elementary schools, pupils have to be led by teachers to understand the context);
- at the highest level, we can talk about text reception typical during the transfer from the first to the second grade of the elementary schools, it depends on the development of the cognitive skills of a given individual.

We have to make an effort to make the reception happen. We have to actuate ourselves. Without a will to perceive the text, understand it and remember it no reception can happen. This will involvement is necessary requirement for the text reception (Gavora, 1991).

Experienced text recipient can routinely perceive the text, quickly and to some extent unconsciously. Unconsciousness is proving that reception processes were perfectly adopted and that they run fluently with no problems. Unconsciousness is sign for effective reception, this is not a negative phenomenon. Depending on the level of the recipient and the difficulty of a particular text smaller or bigger part of such text can be perceived through this unconscious way. Some part of the text can be therefore processed with a higher consciousness, another part with a lower one. Ideal situation where the students should be led is an unconsciousness trouble-free text reception. This level can be reached through progressive awareness of own activity and its improvement under the leadership of a teacher.

This should be done mainly within the text activities that are tough for the particular student and where he/she needs to make a significant effort. Other activities that are performed fluently and easily do not have to be transformed into the consciousness level. But it is necessary to give student a possibility to use and develop them (Gavora, 1991).

Other experts dealing with development of text understanding define four areas (Perfetti, Landin & Oakhill, 2005):

First one, area of general knowledge, allows to orientate oneself in a text, to understand content context on the basis of previous experience.

Second area is linguistic and includes phonological, syntactical and morphological knowledge.

Third area is lexical, and it is focused on the understanding of meanings of individual words.

Fourth area is aimed at the interconnection of orthographic units and corresponding phonological units. We can say that this last area is tightly connected to the ability of decoding. Aforementioned authors declare that ability to read with understanding increases it grows with repeated experiences during reading. Most common form of development of text understanding at schools is formulation of questions, by both teachers and students. When forming the questions, it is necessary to consider fact that understanding takes place on individual levels (from the lowest to higher cognitive activities) and use this knowledge to form the questions or activities relating to the text.

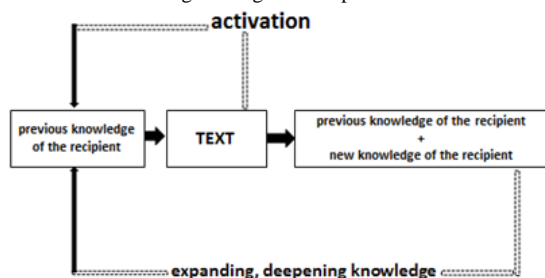
„Questions oriented to different levels of text understanding do not only represent tool of its detection, but mainly tool for development. Asking good, well-considered questions focused on understanding is one of the crucial factors that influence how the reader approaches text and its understanding“ (Zápotočná, 2012, p. 99). At present there is a wider selection of reading methods (e.g. Cloze-test, Cinquain, Term map, ...) and strategies (PRISE, RISE, ...), it is not enough for the teacher to adopt their progressive steps and apply them to any text. For the teacher it is necessary to know how to implement these into process of work with text and to use them for means of development of understanding.

„Reading represents intellectual activity that is applied in every class of the first and second grade of the elementary schools and the secondary schools. It supports learning ability. It is the most valuable method of getting information and at the same time it is a mean of self-fulfilment“ (Manniová, In Gavora, 2008, p. 27).

„To understand the text not only information involved in a text, but also certain knowledge previously acquired in the given area is crucial for recipient“ (Gavora, 1991).

Process of using of existing knowledge during the text reception can be mapped as follows:

Scheme 3 Knowledge during text reception



Source Gavora, 1991, p. 26

For activation of existing knowledge we need three basic conditions, namely (Gavora, 1991):

- 1) – existing knowledge has to be formed in a system – unit (knowledge should be structured) that is activated during the text reception;
 - recipient has to know how to put the existing knowledge into the context together with information involved in a text;
- 2) – students differ in ability to activate their existing knowledge, therefore there are significant differences between them;
 - it is not helping if student cannot remember his/her existing knowledge and use it;
- 3) – for activating the existing knowledge, it is necessary that text brings enough impulses for the recipient;
 - it is also teacher's role to activate student's existing knowledge;
 - student's task is to identify relationship between text's content and existing knowledge.

3 Interpretation in relation to text understanding

Interpretation and text understanding are two inseparable parts; therefore, we cannot understand them as two isolated elements. „Understanding of text is an interpretation, it is searching and finding of a meaning of the text, it is an explanation for ourselves“ (Gavora, p. 51). Dolník and Bajžíková (1998, p. 102) states that „core phenomenon during analysis of text interpretation is mechanism of sorting of gradual apperception (perception with understanding) of text components that leads into the interpretation of the communication unit in the sense of its functions“.

In the linguistic context, the term “interpretation” is often used with attributes, for example, semantic interpretation, syntactic interpretation, phonological interpretation, etc. (Dolník, 1998). These attributes describe the actual processes involved in the perception of language expressions. A child processor is initially influenced by semantic and pragmatic strategies rather than syntactic ones.

During interpretation, children rely on perception and general knowledge. Syntactic strategies are not typically utilised at the initial stage of language processing development. When faced with syntactically complex sentences, children tend to rely on passive knowledge. The semantic representations created by children are typically of the “bottom-up” kind. Based on the relationships between concepts expressed by words in a sentence, the child arrives at the meaning of an utterance (Schwarzová, 2009, p. 128–129). In connection with text interpretation we can talk about reader's interpretive competence. Interpretive competence „is the ability of a language user to relate the structure of language expressions to the structure of his or her knowledge which is necessary for understanding the text“ (Dolník & Bajžíková, 1998, p. 107).

Jurčo and Obert (1984) distinguish interpretation from the view of variability of function aspect to literary-scientific, literary-educational and interpretation in a narrower sense. Literary-scientific interpretation approaches the examination of the particular work from the literary-theoretical, literary-historical and literary-critical view. Literary-theoretical interpretation is focused on artistic elements of the literary text. It observes nature of its existence within the content and form. Literary-historical interpretation examines character of the literary work in relation to literary-historical complex, it is oriented to the literary tradition development benefit. Literary-critical interpretation deals with observation of particular structure components of a literary text.

During interpretation of a literary work within the context of literary experience and culture of an interpreter (on the basis of his/her literary education) we can talk about literary interpretation in a narrower sense. „This is confrontation between literary work and existing level of individual literary

experience. Relative accordance between facts of interpretation nature and facts of artistic text pattern represents measure for its value (Jurčo & Obert, 1984, p. 40). With respect to teaching of literary education meaning of literary-educational interpretation is being emphasized. Its model is influenced by control, didactical and regulative function. School interpretation represents unique style of interpretation – it examines communication relations between structure of a literary text and a recipient and it is dependant to the method and dimension of perception of the literary work. We can distinguish between „literary reading“ (reader’s interpretation), „literary behaviour“ (diagnostical interpretation) and audio interpretation where we can find recital of poetry and prose (Jurčo & Obert, 1984).

„Reader’s interpretation of the literary text is primary connected to the education of the reader as a basic participant of literary communication. It characterizes organization of individual parts of a literary work within the reader’s consciousness on the basis of artistic statement about world and life, which was acquired through the reader’s existing contact with literature“ (Jurčo & Obert, 1984, p. 43).

There is also so-called natural text interpretation, which „includes knowledge of its content and sensual part. At first, we focus on the interpretation in relation to the content part, it means we are interested in the natural content text interpretation abstracted from its pragmatic (sensual, illocutionary) interpretation“ (Dolník & Bajžíková, 1998, p. 108).

Text interpretation does not have to mean insightful explanation of the meaning and it should not be firstly carried out through the frontal education. Such proceeding allows giving pupils finished knowledge, there is no possibility to acquire relationship to a literary work and to produce own texts (Hník, 2014).

According to Hník, we can understand full-value interpretation activities as relationships between text and activities. Within the pedagogical-educational process it is inevitable to pay attention to such interpretation activities that are at the same time very creative. Especially if „we truly care for the movement of the core of the education from knowledge towards abilities and at the same time for work with own content of the field of study and school subject – through texts of artistic literature“ (Hník, 2014, p. 62).

Following the interpretation activities, we can also talk about relevant interpretation knowledge. Relevant interpretation knowledge is defined by Dolník and Bajžíková (1998, p. 109) as knowledge, which is „directly connected to text (text knowledge) and knowledge, that is related to its environment (non-textual knowledge)“. Among the text knowledge we can assign language knowledge, namely phonological, morphological, syntactical and reference knowledge. Except these we can also assign knowledge about kinds of text, stylistic knowledge, intertext knowledge and knowledge about the content parts of the text. Among non-textual knowledge we assign knowledge about the author of the text (recipient approaches the text with some expectations that relates to the image, which he/she created about the author of the text), abstract knowledge (it is possible to identify abstract themes and their implications) and empirical (they touches perceivable world and they relate to standard forms, for example traveling, public celebration, meeting, elections, doctor’s appointment etc.) knowledge about the world (Dolník & Bajžíková, 1998).

Conclusion

Through presented paper we wanted to create view into the problems of text, its understanding and interpretation. Relation between interpretation and understanding of the text is very close, there is no sense to perform interpreting without understanding. To ensure high-quality interpretation, it is necessary to develop understanding through means of text, which is incentive and meet requirements that were brought nearer in this study. Important part of work with text is

represented by interpretation activities, which should not be just mechanical activity, but should encourage students to be creative.

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Primary Paper Section: A

Secondary Paper Section: AM, AN

THE DYNAMICS OF INTERNATIONAL PROJECTS AND THE ROLE OF INTERCULTURAL COMMUNICATION

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The paper was processed under the SGS grant Internationalization of regional business environment.

Abstract: This paper aims at better understanding of the internationally driven projects. Through description of its specifics such as multiple locations or various organizational cultures, it highlights the intercultural issues given by different origin of project team members. The impact of cultural values with focus on time orientation and communication is analyzed. The paper concludes that the international project management must be prepared for intercultural clashes and learn how to manage them especially through effective communication. Other competences required for maximal understanding and success of the project coordination are listed.

Keywords: culture, intercultural communication, international, project management.

1 Introduction

Worldwide development is driven by international and intercultural cooperation. Naturally, these forces increase demand for skilled human capital creating the global labour market and global workplace. Moreover, projects comprising people and organizations from different national cultures have become usual part of business which has given rise to several challenges for the nature of current business environment.

Projects such as construction of infrastructure, production, defense systems, software development and many others represent a significant share of the World's Gross National Product. According to the latest data from the World Bank (2018), around 24% of the world's \$75,8 trillion gross domestic product in 2016 was gross capital formation which is almost entirely project-based. This share is generally, but not always, higher in developing countries. For example in China it counts for 44%, in Germany it is 19%. Nevertheless, project management significantly contributes to the global value creation (Anbari et al, 2008).

Studies from last decades (Jackson et al, 1995; Snow et al, 1996) have demonstrated that the performance of multicultural teams is a vital determinant influencing the organizational success and the overall firm's performance. Increasing globalization and internationalization stimulate interest in developing the processes to ease the communication within culturally diverse teams working on mutual projects.

As several researchers (Milosevic, 1999; Pinnington, 2011; Hill, 2014) claim, the interpretation of the same project management practices differs. Moreover, the role of project managers has changed. They need to be not only technical experts but also business managers ready to face cultural clashes (Milosevic, 1999). As Müller and Turner (2007) continue, the research shows the need for training of project managers on cultural differences, building awareness for different cultural value systems and the difference in success criteria and achievement. According to Zeng et al (2009, p. 38); "*Cultural difference is the major factor affecting success or failure of projects*" which highlights the importance of intercultural competences as a way to get the intercultural communication effective.

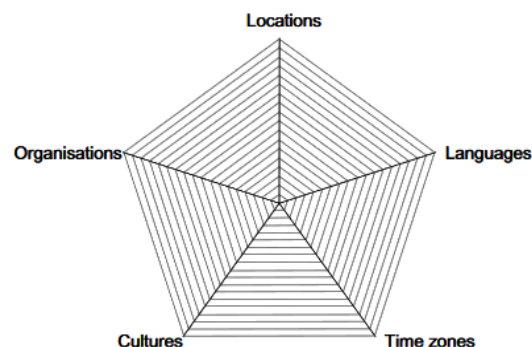
2 Global projects' specifics

Projects investigated in this contribution are associated with international and intercultural aspects. Binder (2007) views international projects as global projects including people from more than one organization. He developed five following dimensions to evaluate the level of the project complexity:

- Number of distant locations. The team members of international project are located at least in two different countries. The contact is facilitated by teleconferences and videoconferences. Since face to face contact is missing, the communication competences of project team members are crucial to ensure an effective meeting.
- Number of different organisations. International project managers must adapt their skills and the team members to the multiple policies, procedures and organisational cultures (depending on the complexity of departments and companies).
- Country cultures. Project managers must react to the increased diversity in the work environment. Different cultural values affect team spirit and basically all project activities and phases. Practices to manage the cross-cultural communication should be applied.
- Languages. Although multinational organizations tend to establish one corporate language, when working on international project there is continuous presence of other languages. As research shows, the native language is a direct determinant of the way people communicate and therefore an influencer of the effectiveness in intercultural discussion.
- Time zones. Depending on the project specifics, there can be project teams whose members are spread in different time zones. This brings difficulties in meeting organization and settling the deadlines. Delays can happen very easily but defining the precise procedures and implementing a 'follow-the-sun' strategy can help to avoid the problems.

Described dimensions of international projects' complexity can be displayed by the figure 1 below.

Fig. 1: Dimensions of global projects



Source: Binder (2007)

The lowest complexity lies in the centre of the chart. Increasing distance from centre means higher projects' complexity such as various departments and organisations, team members from different cultures, multiple languages, and working across the globe. The figure is a useful tool for companies to see the international specifics of their projects and to recognise where the focus of their management might be needed the most.

3 Cultural values in project management

Studies in the last decades have clearly shown that management practices are natural behaviour resulting from national cultures and that there is no universal effective way of management (Hofstede, 1980; Trompenaars, 1993). Management processes of international scope are defined not only by geographical distance but also by institutional, economic and cultural distances (Ghemavat, 2001; Čuhlová, 2016). Its multidimensional concept represents the great challenge but also may bring significant synergies and unique outcomes.

Multicultural project teams are melting pot of different national cultures where certain project techniques of one cultural cluster are based on assumptions that may not hold in another differently oriented societies. As Hofstede (1980, 2001) has stated, there are several important cultural elements influencing the project management strategy in planning, organizing, motivation and controlling resources as well as team development process: material culture referring to physical objects and to the results of technology; language as a tool for effective understanding among team members; aesthetics that encourages informal and more open communication; education which may display various views of problem of team members; religion, beliefs and attitudes demonstrated their work ethics attitudes; element of social organization standing for networking; and political life that is related to labor laws and other regulations.

When talking about cultural differences resulting from various values, often segmentation is made into Western and Non-Western or Eastern cultures. We consider this split as very arguable due to forces of globalization however it still has its justification and seems the most accurate. Kohls (1981) and Marquardt and Kearsley (1999) defined the list of values and their impact on project management including motivation, training, decision making or coordinating with other project participants. The values that drive their behavior. As values with positive impact of combining both values on outcomes they indicate following while first value states for Western cultures and the second value states for Non-Western cultures:

- Individualism vs. Collectivism
- Winning vs. Collaboration/Harmony
- Respect for results vs. Respect for status/ascription
- Specific/linear vs. Holistic
- Verbal vs. Non-verbal

As values and attitudes with negative impact on project management so called culture clash are described following:

- Equality/egalitarianism vs. Hierarchy
- Respect for competence vs. Respect for elders
- Time is money vs. Time if life
- Action/doing vs. Being/acceptance
- Systematic/mechanistic vs. Humanistic
- Tasks vs. Relationships/Loyalty
- Informal vs. Formal
- Directness/assertiveness vs. Indirectness
- Future/change vs. Past/tradition
- Control vs. Fate

Last group of values is with no direct impact on outcomes:

- Achievement vs. Modesty
- Guilt (internal self-control) vs. Shame (external control)
- Pride vs. Saving face

Of course, these potential various attitudes affect the project management in its different stages that is also important knowledge necessary to take into account. For instance, values of Equality and Hierarchy will be displayed when defining and planning the project, managing risk and uncertainty and in times of communicating and cooperating over project. Contrary, the orientation towards Tasks vs. Relationships will be more likely to be demonstrated when managing stakeholders, controlling activities, leading the team as well as learning. The relationship between areas of the project management and the most common cultural differences are described in the model called Culture gap tool (Koster, 2010).

3.1 Time orientation

As the key aspect affecting all internationally carried activities is necessary to name time orientation. Hofstede (1980, 2001) and Hofstede and Hofstede (2001) differentiate between short-term vs. long-term orientation important for the mutual understanding of deadlines. Another issues might appear when some team

members will be able to work concurrently on more projects in one time and will expect the same from others that might contrary prefer to finish every single activities before starting the next. This differentiation was observed by Hall and Hall (1990) that distinguished monochronic and polychronic perceptions and Trompenaars (1993) and his so called Sequential vs. Synchronic oriented societies. This different approaches manifest themselves also in relationships between the team members. So called monochronic people prioritize the time and the schedule over developing relationships with project partners as could be the matter of polychronic personnels.

Moreover, orientation of individuals towards past, presence or future can be another reason of misunderstanding. In organizations where is shared future (or so called long-term) orientation, people do not put emphasis on previous achievements and experiences as the context of past is not in main focus. Immediate accomplishments such as year's profits are not the key evaluation criterion of the company's performance. Generally, this aspect is included in company's planning activities, strategy and aspirations (Trompenaars, 1993; Hofstede, 2001).

Time orientation is very closely related to communication (Hall, 1959, 1976). As Hall argues there are four types of time: Schedule, Discussion, Appointment and Acquaintance. First two types differentiate period that is dedicated to tasks or contrary to business conversation. Appointment time states for punctuality where can be observed huge differences and therefore serious misunderstandings. Time of Acquaintance is dedicated to developing the relationship within the project team. This is the parallel with Trompenaars's (1993) polychronic orientation.

3.2 Communication

Getting required information from the other multicultural team member might be challenging task and requires a certain degree of cross-cultural competences. This competence should be built on knowledge of culture and language (both verbal and nonverbal) but further develop by communication skills and also relationship and behavioral skills such as empathy, being unprejudiced, open and be able to manage uncertainty (Congden et al, 2009).

Matveev and Nelson (2004) developed the Cross-cultural communication competence model that constitutes from four dimensions defining abilities and characteristics in order to communicate within the multicultural project team effectively. These dimensions are: Interpersonal skills, Team effectiveness, Cultural Uncertainty and Cultural empathy. Firstly, the Interpersonal skills dimension deals with general relationships. Project team members should feel comfortable when communicating with foreigners and be able flexibly deal with different interaction styles. In the Team effectiveness dimension it is important to discuss problems and solve conflicts. Team spirit, cooperation and ability of constructive feedback are the critical skills to have. The other two dimension of cultural uncertainty and cultural empathy deals with issues resulting from cultural differences. Dealing with cultural uncertainty, impatience, ambiguity, risks and inflexibility are reflected in the Cultural uncertainty dimension. The last Cultural dimension then focuses on abilities of understanding others' perspectives, values, beliefs; appreciating different working styles and generally not being judgmental to dissimilarities (Matveev et al, 2001; Matveev and Nelson, 2004).

Similar list of competences can be found in other existing models of intercultural competences summarizing the skills, abilities and attitudes. Although the factors of intercultural competences are in literature differentiated from the intercultural communication competences, we see communication as the most crucial element.

Conclusion

The success of project management teams is importantly determined by the way in which cultural differences are considered, understood and managed. These differences are potential asset how to reach the success but also a challenge for the project managers as well as all project team members.

When discussing the abilities and competences that should the perfect international project manager have, we need to keep in mind that extreme degree of mentioned characteristics (such as being toospontaneous, too direct, too expressive) is harmful. Generally, project managers should be culturally sensitive and work on developing their intercultural competences. Through effective leadership, cross-cultural communication, mutual respect, the international project can succeed despite the diversity among the project team members. The communication remains the key tool how to reach mutual understanding and thus the aim of the project.

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Primary Paper Section: A

Secondary Paper Section: AE, AH

THE BASIC STRATEGY OF THE HOLY QURAN FOR THE FORMATION OF A HEALTHY SOCIETY AND PREVENTING CRIME AND DEVIANCE

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Abstract. According to the Quran, there are two kinds of differences between people, which form the criminal and deviant behaviors. One difference is pre-religious or in other words, differences in material and worldly affairs, and one difference is post-religious in which individuals and communities commit a crime and violence against each other with religious incentives and claims. Each of these two types of differences and, consequently, each of these two types of deviant behaviors need the response and prevention of their own. According to the Quran, to deal with differences, wars and conflicts, the spread of monotheism in the community is needed. Monotheism solution to resolve the first type challenges is, the legal system based on religion and no other way can replace it. In fact, all the ways gone from human, have so far been inconclusive. Monotheistic method, contrary to the law, and foster a moral spirit, is a way that its result is permanent and guaranteed, and never allows the abuse and rape to humans. However, the second difference, which caused by jealousy and rebellion, in fact, is a form of mental illness, which the above ways cannot cure the first type deviation, and it is as a cancerous tumor, which must be physically eliminated in order to prevent contagion to other people.

Keywords: The Qur'an, the prevention of diversion, social health, Monotheistic Morality, pre-religious crimes, post-religious crimes

1 Introduction

There have always been crimes, and the human has always thought, how to get rid of it. However, it was thought that the only way to struggle with it was punishment and intimidated in the offender or other individuals. Therefore, they increased the severity of punishment, to the point that, sometimes, they hurt the offender's body after death, so that other people understood it! The intensity of the struggle with the offense had the opposite effect and thus, in the eighteenth century, people were found to defend the criminals, which means they recognized the penalties more than enough to deserve. Hence, several doctrines were found in this regard, that the most important was penal rights realization doctrine, which Lambrozo, Garo and Ferry founded. (Pradel, 2014: 89) They denied the unfair and free will, considered the harsh penalties useless, (as) needed for research on various conditions of the crime emergence (not the criminal). This led to the creation of the criminology, which gradually, it took on the task of prevention of crime and, globally, conferences will be held in this regard. One of the examples is a criminology international conference, which holds every five years, with the participation of government representatives and international organizations and experts in different countries (Danesh, 2002: 15).

Since then, numerous theories have been proposed on the fundamentals of the rise of crime and crime prevention, to the extent that, some are considered in conflict with others. Some explored this issue with biological explanations, some with psychological explanations, and others with sociological explanations. Some, essentially, denied the free will of criminals and considered that criminals are not criminals, but they are born as criminals! (Alimardani: 120)

2 Problem statement

By studying the Quran and hadiths, we can consider the opinion of some researchers who believe that there is no society without crime, (Salimi and Davari: 54) and it is confirmed partly by Islam. In the first moments of Allah will, for the creation of man, angels predicted that, people always would have crime and for

this reason, they asked a protesting question against the way of Allah, since you have the worshipers like us, why did you decide to create a norm-breaker creature, in the name of humans.

The prediction of Angels, during the creation of the first man, Adam, peace be upon him, just proved and human society, from then until now, has always observed fine and coarse crimes. Whether, we can construct a utopia, in which no abnormalities and no crime will be in it, has been the subject of scientific thinkers' reflection and debate from different fields. Therefore, with fundamental questions such as "Why do people violate their limit and trespass the rights of others?" they look for the roots of crime, in most societies, and accordingly, they take action to prevent crime. In this article, we will try to refer to the Quran, and analyze the crime and violence by a man. The answers to these questions can determine the basic strategy of combating crime, violation and perversion. Obviously, without a realistic strategy, any action to prevent and reduce crime will not have a sufficient and favorable result.

3 Allameh Tabatabai's opinion about crime in the community

Tabatabai considered two important factors for the emergence of crime in society: the first one is the special and the two-dimensional creation of human and the second one is the employment spirit in the human.

3.1 The special and two-dimensional creation of humanity

Allah said to the angels, I want to place Caliphate on earth, and they found that this causes corruption and bloodshed in the land. They knew that since a land creature is material, he must consist of anger and libidinal forces, and since the land is a conflict house with limited directions, and there are many disturbances, they are subjected to abolish, and order and reforms in corruption and falsehood. Therefore, life is not just social, and survival in it, will not reach the perfection, but with social life, and it turns out that this lifestyle will eventually lead to corruption and bloodshed. (Tabatabai, vol. 1: 177)

However, the reason why angels protested is in the fact that the man who is supposed to be the Caliphate of God on earth certainly committed a crime according to his special creation. On the other hand (as its name implies), it is not realized unless the Caliphate will be the representative, and a full view mirror of God, and tell the story of his aspects of existence and effects of laws and measures. Of course, those effects and the rules and considerations that God appointed the caliphate and his successor to meet them. God is pleased with the caliphate and he is qualified with traits of beauty and majesty, and in the nature, he has no flaws, and in his action, he has no evil and corruption. Caliphate will flourish in the land, and with the mentioned effects, he has an earthly life, he is not worthy of the caliphate ate, and by being mixed with all defects and disadvantage, he cannot be a mirror transcends any flaws, and holy existence, as the saying goes (where is Traub? and where is the Lord?) (Same)

Tabatabai wrote, so the bottom line returns in the sense that Caliphate means the Caliphate and the successor represents God with hymn the praise and sanctify, and the earthly life does not let such demonstration to him, but on the contrary, it brought him to corruption and evil. On the other hand, when the purpose of establishing a caliphate on earth is praising and sanctifying that display your God traits, it is resulted from our praise and sanctify, then we are your caliphate, or make us caliphate, what are the benefits of making this earthy creature as your caliphate? In rejecting the words of the angels, Allah said (I know what you do not know, and taught Adam all the names). (He: 178)

3.2 The employment spirit in the human

On the other hand, the employment spirit in the human can be involved in the crime. To explain, everyone loves to reach his desires and needs. In addition, since he cannot realize them alone, and he tries to employ everything and everyone in order to achieve his goals. Since the response of others to the demands cannot be positive, but others are looking to employ, it would cause conflict and thus provide crime. Tabatabai wrote:

"... Including the thoughts and perceptions of human recognition is the recognition that it is necessary to employ anything that is effective through perfection. Therefore, he begins the provisions of this world, makes tools to possess in the other provisions. He makes knives, saws and hatchets, needle for sewing, and container for liquid, and ladders for climbing, and other devices, that their number is out of numbers, and it is not limited in terms of composition and detail, as well as he makes industries types and techniques, to achieve the intended targets. Then, he starts to capture plants, and recruits them through making food, and cloth, and habitability, and other needs, and for this purpose, he possesses in a variety of animals, and uses their meat, blood, skin, hair, wool, cashmere, Horn, and even their dung and milk and offspring. He even uses the animals' works, finally, he will not convince to exploit and abuse animals, and he employs his fellow man, and serves them in every way that is possible for them." (Same: 175)

Ayatollah Javadi Amoli also wrote:

Man, by nature, is civilized and theologian and wants social justice and helps his fellows; but, in terms of excelling nature, which returns to physical nature, follows lust and wrath. He does not think of anything but to employ and exploit others, because his nature is closer to a sense and material and he takes the responsibility of personal and social affairs, and he rules. Therefore, as he uses inanimate objects, plants and animals meet the needs, he tries to employ others to his own unilateral. Meanwhile, he cannot live alone and on the other hand, he finds his mutual expect of his fellows, therefore, inevitably, he accepts the mutual service and social respect; but if he reaches the power and authority, he violated all the rules and national, regional and international obligations, and employed or captured scientific and practical powers. (Javadi, C 10: 413)

Mixing this spirit, with different cultural habits and education exacerbates it and it is considered as a threat to any society. Because the person who is stronger, is seeking to serve the poor, and has more exploit. The worst is that he often wants to force labor, without giving anything to him, and the defeated is forced out of necessity to deceit and guile against the prevailing injustice, until the day that, he will be strong. Then, he revenges the cruel of oppressor in the worst aspect. This leads to conflict and chaos. It seems, the occurrence of this process is necessary among individuals in a society, and explaining the rules stems from such matter.

Plato and Aristotle attributed the crime to inner emotions and motivations, (Salimi and Davari: 7), probably, considered something similar to what Allameh has said. Of course, they spoke about the possible impact of social and economic organization and considered poverty as one of the favorable conditions to the formation and expansion of crime. (Ibid)

4 Prevention of crime, deviation and difference

Deviations, crimes and violations that occur in a society are two types in general. Some differences lead to crime in material and worldly affairs and have motivations of gaining wealth, power, and lust. However, some of the violations and deviations can be done with religious motives. These people oppress and seek spiritual rewards in the name of religion and their opinion. The first type of deviance can be called "pre-religious" crimes and the second type is "post-religious" crime. Each of these two deviations demands their own methods that will be mentioned briefly.

4.1 Pre-religious diversions

A forgiveness that humans have because of their special nature, which means the two-dimensional being, on the one hand and the spirit of employment, on the other hand, tends to break the norm, and so on. This is possible when no obstacle will be observed on his way (The rights to overshadow that saw him sacked Alaq: 6, 7). Human intellectuals have understood the foregoing points, and have always sought to create obstacles and control human behavior and have come various ways in this way. However, what can be seen, today suggests little or no success of all the ways. In an era when, technological developments have created the impression that crime, control should be done much easier than ever, but heavy statistics of crimes in different communities have despaired of such suspicion. However, what is the solution? In general, the existing solutions in controlling of the victim's behavior can be divided into three categories: legislation, the strengthening of moral conscience, religious method. In this part, with explaining the failure of two first types: preferring a religious approach, stating from Allameh Tabatabai will be listed, will be explained.

5 Moral education methods, in order to prevent crime and violation

5.1 Legislation

In this method, which is the conventional method, in today's world, it is analyzed such a way that, should force people to accept the laws that legislated to attend all classes in the right to life and their equality in rights. In this way, anyone can reach the degree of perfection of life that he deserves to be. In this way, they cancel the religion and religious teachings of monotheism and ethical virtues completely, which means they do not consider these special religious beliefs, and do not consider them necessary to respect. They know the ethics depend on the community and social changes. They count each mood, which is agreed with the community mood as a virtue, however, whether it will be good or not in itself or according to religion. For example, one day of modesty and chastity is considered as a virtuous morality, and other days, unchastity and indecency; one day honesty and truth will be a virtue, and the next day, lying and deception; one day the trust will be a virtue, and another day, betrayal and ...

5.2 Create ethics

In this method, for imposing laws to the people, they are trained and they created the ethics that respect and sacred laws spontaneously. In this method, religion is considered invalid in social and human education.

These two methods are the ways of imposing law on people, which have already been treated. In one of these two methods, they seek to control human behavior only through force and dictatorship of the law, and through moral education in another method. While these two methods are, not only the ignorance, but also they follow corruption that the most important of them is the destruction of humankind, of course, the destruction of humanity.

Note that the human is a creature that Allah created him, his existence depends on God, and starts from God, and soon he returns to him. Therefore, his existence does not end with death, he has an eternal life in the future, and the fate of eternal life shall be ascertained in this world. Therefore, any method that he has taken from here, and he has acquired great virtues by exercising the method, he will be with great virtues in eternity. If he achieves moods and great virtues, according to Monotheism, which means each action he made, was according to the fact that he was a servant of Allah, and his initiation is with him and ends with him. Inevitably, he was an individual that came in the form of men and went in the form of man, and if he forgets monotheism, in fact, he covers his truth, and he is an individual, who came as a man and went as a beast.

5.3 Monotheistic method

There is a third method, which is particular for the Holy Quran. Allameh said this method does not exist in any of the doctrine that we have access until today and it is not cited in any of the teachings of the prophets of the past, and none of the philosophers and theologians has been demonstrated it. The method is that eliminating the moral vices must be through excretion, rather than elimination, in the sense that, from the beginning, we should do something so that inappropriate traits and morals do not enter the hearts, not the person fails and infects his inside and then tries to eliminate it.

In physical warfare, we can choose two kinds of fight with the enemy: excretion and elimination. Excretion means that, from the outset, they create hard barriers against the enemy so he does not enter the territory. Sometimes, they change the war tactics and allow them to enter the territory, with the intention to capture them. The first one is called excretion and the second one is eliminated. It is better to excrete the enemy than eliminates him. Not a sin to heart and keep it clean is better than infecting it to sin and then erase it. Any action that man does for non-God is in order to achieve a goal or dignity or because of fear of force, which wants to get rid of it. The Holy Quran also recognizes the dignity and power belong to the Almighty God: Glory to Allah that all (Yunus: 65), the power of God all. (Al-Baqarah: 165)

A person, who adheres to such teaching, does not enter anything into his heart, but God and his heart will be full of moral virtues. With such a view, the man considers himself as a poor and he considers the God as an absolute rich. Such a man will never ask the non-God by strengthening his Monotheism, and he will never show humility in front of the non-right. He will never afraid of anything but him, and he never likes anything but him and he never enjoys anything except his prayer and saying the right. (Khalili: 134)

The previous matters can be clearer with one example. Imagine a group of human being a long distance in the form of a caravan, and they have all the parts and provisions to achieve their goals during this distance. They are required to pass homes in order to reach the destination and they are required to stop at each home. However, there will be differences in the first home, and caravan people fight each other and kill each other, rape, steal their property, and seizure their place, then, they get together and make the so-called Assembly and legislative to choose what way to take the lives and property be protected?

To resolve the crisis, one of the selected people suggests that:

Let us eat whatever we have together, meaning everyone has a share according to his social weight, because there is no home except this home, and if someone violates, we suppress him.

Another selected person says:

No, let us first legislate a law, which will be responsible for resolving the conflict, and ensure the conscience and personality to implement that law. Because each one of us had our own personality in the provinces and cities, and we treated with mercy, kindness, courage, and virtue with our companions for respecting the personality, we eat whatever we have together, because we have no other home than the home.

It is clear that they were wrong and they forgot that they are passengers, and they reached the "first home". It is clear that passengers should respect his state at home and in his destination primarily, and if he does not respect, he has not other fate than perdition and destruction.

A third person comes and says, recalling the purpose of travel and travel conditions:

People, you only should eat the amount that you "need" tonight, and it is necessary to save the rest for a long way ahead. Do not forget that when you forced out of your country, what they

wanted you; in return, you should have met those demands. You also do not forget that you had a specific "target" in this trip, and you should reach that goal.

Holy Quran strategy in achieving public health and preventing the first kind conflicts (pre-religion) is the same, which is based on attention to the creator of the universe, the purpose of creation and religion based on believing the resurrection and accounting practices. If a man forgets, why and for what purpose, he has set foot in the world, and if you place the best laws, and the most powerful observers, and the police to control his behavior, he will be intelligent. Since he is a man, he has a temper of outbursts (Layatghi), and he will find a trick, to get rid of the law or the police. It means the deviation and transgression will have no end.

In this regard, there are numerous verses that we mention two or three examples in brief:

Verse 25 of Sura Hadid: We have sent our messengers with clear proofs, and revealed to them the Scripture and the Balance of the people with justice

Baqarah verse 213: People were one nation Then Allah sent prophets and evangelists warners and sent down with them the Book in truth to judge between people disagreed with it

Verse 53 of Surah Yusuf: And what acquitted that self-prone to evil except what the womb of my Lord, my Lord is Forgiving, Merciful.

Regarding the latter verse, it should be noted: in the top of the verse, the reason of human diversion and committing ugliness will be introduced as the material dimension or the sensuality of abuse. Given to A and Lam in the word Alansan (Zamakhshari, vol. 2: 480 and Tabarsi, vol. 5: 368) it introduces each person for sharing in the nature prone to do evil. Then, with one exception, it considers the only way to avoid this nature of evil, "mercy" of the Lord. It seems that "mercy" at the macro and social level, means, divine intervention in human guidance. Tabarsi late concluded the verse:

I do not consider myself innocent from what any human nature [ie the desire to do evil]. The only thing that was prevented from doing evil was the divine will and his grace and guidance not my desire. (Tabarsi, Vol. 5: 368).

We cannot conclude a personal event from this verse, that God prevented Yuseph from sin. But, according to the word of commentators, that have considered A and Lam in "Alansan" to end, and according to the fact that citing this case is in order to express a matter of fact in the creation of man. It is necessary to conclude, not just human beings, but human society, without "mercy", or the guiding of the Lord, cannot prevent the difference between the human being. This theme can be searched in the following verse:

In addition, if thy Lord had willed to place all the people as one nation (with no difference) and he did, but they always differ ... unless, a person, who Lord has mercy! For that (acceptance of Mercy), he created them! In addition, word of the Lord fulfilled that I fill the hell with the (Rogue and Rebel) jinn and humankind! (Hood: 118 and 119)

5.4 The post-religious deviations

Some people are drawn into transgression and deviation with sacred motivations and religious. They are themselves made up of two groups: "Fools" and "scholars". Dealing with their crime and deviance is much harder than the past group because it is very hard to prove their outrageous deviation. The Quran says about these people: (Al-Kahf: 103 and 104) Say, should we aware you of those losers? Those who waste their efforts in the life, but they think, they are good.

Holy Quran stated that the purpose of sending messengers and prophets is expressing the laws that eliminate first type

differences in the light of remembering the God and the resurrection. It warned there is another step of difference that is "rebellion" and religious rebellion:

"People were one nation Then Allah sent prophets and evangelists warners and sent down with them the Book in truth to judge between people disagreed with it and what differed only Ootuh who came to them after they had evidence, including a prostitute" (Al-Baqarah: 213)

Khawarij are a history example and Daesh is a true-to-date example of this mindset. The situation of these people is in a way that, a great man as Imam Ali (PBUH) also, can hardly cope with them. The "Samaritan", can be an example of the Quran in making the religious difference in the community and we know, that Aaron peace be upon him, as the successor to Moses, could not do the action in front of his movements.

Another Qur'anic example of this process was the people who, established a mosque, as "Dirar mosque", sought to create a distinction and deviation in society.

By looking at how religious leaders deal with the examples above, it can be concluded that the method of dealing with them is not possible with monotheistic way and strengthened the religion of belief. Because, as the Quran says, they thought, they have the true religion and monotheisty in their possession, but the removal of their evil from society (in every possible way that calls for the interests of the community), is the best way. One time, with the repression, as it was dealing with the Khawarij; one time, with exile as it was dealing with the Samaritan; one time, with the destruction of the community center and the population, as it happened in Dirar mosque. In the absence of choice, and when the example of "the last cure is suffering" is realized, with the execution and the physical extermination of the people, we can prevent the diversion and difference. Experience has shown that, not legislation, not strengthen the moral conscience and not even monotheistic way, can help to get rid of this mentality in making a society healthy. From this description, we can understand the philosophy of death penalty, for certain crimes, such as "apostasy". Apostasy, if by itself, does not lead to discord and divergence, it has not any punishment. However, if it causes damage to the health and safety of community, there is no choice, but to ward off the evil of this deviation (in general or special deterrence).

Regarding the Moses encounter with the Samaritan in the interpretation (PBUH), we read:

In the case that Moses wanted to stand in front of hundreds of thousands of calf-worshippers, just with preach and advice and some argue, he did not move forward certainly. He had to stand against three groups, decisively and against his brother, the Samaritan and the calf-worshippers. He started first with his "brother", and took his beard and shouted after him and in fact, he constituted a trial for him (though eventually his innocence was proven to the people) so that other understands their situation. Then he moved to the main plot factor, ie, "Samaritan" and punished him or her that was worse than death, exclusion from society, and to isolate him and make him unclean and infested that everyone should take away from him and threaten him to painful chastisement of God. Next, he came to the calf-worshippers of Israelites and told them, your sin is too big, which there is no way to repent of it, but place sword among the group, and a group will be killed. These dirty bloods pour out of this community body and in this way; a group of sinners dies by their own hands, so that the dangerous deviation idea goes out of their brain forever. (Makarem Shirazi, C 13: 291)

This shows that these deviations, after the knowledge and facts, by religion and they are not in ignorance, which hoped, by law and conscience or religion, corrected it, but, breaking the norm is the rebellion, envy and aggression and has no choice but intensive construction.

Conclusion

Some of the differences and divergences of human behavior are due to the nature of the material and his two-dimensional nature. For making a healthy society from the risks of such problems and prevent such deviations, there are methods, including legislation, penalties, strengthening of conscience. According to the Quran, the best way is attention to the Creator and His purpose to create us and to remind us of the accounting day of resurrection, and in a word, religion legislative. However, for crimes that have religious motives, we have no choice but to prevent them from accessing them in the society and the community. This distance can sometimes lead to remove them physically. This is because of the fact that they do not commit oppression out of ignorance, but their oppression of the human rights of community stems from a desire to violate.

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Primary Paper Section: A

Secondary Paper Section: AO, AD

SENSITIVITY ANALYSIS APPLICATION IN THE COMPANY VALUATION: THE CASE OF DISCOUNTED CASH FLOW METHOD

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This work was supported by the Slovak Research and Development Agency under the contract No. APVV-14-0892, APVV-15-0149 and by the grant VEGA 1/0437/17.

Abstract: Valuation of the company or its parts is an important challenge of any conducted business. The presented paper discusses this topic with emphasis on selected approach for manufacturing company valuation that is discounted cash flow method. The analysis and evaluation concerning stated method are made. The principal objective is determination of the most influential variable impacting development of company value. Subsidiary aim involves effort to identify force of every examined variable on resulting company value change. In this connection, the crucial factors are reviewed. These are namely future free cash flow, weighted average cost of capital and growth rate in future free cash flow. According to numerous empirical studies dealing with company valuation issue the sensitivity analysis is picked as analytical tool for research along with other performed computations. Investigation leads to conclusion that the most dominant variable emerging within discounted cash flow method for company valuation is weighted average cost of capital. Eminent attention should be thus paid to this factor. In the context of further goal, the future free cash flow keep the second place and the growth rate in future free cash flow the third one. Moreover, the paper offers potential for next research.

Keywords: Company valuation, discounted cash flow method, sensitivity analysis

1 Introduction

The company valuation issue appears, in considering the current global and not only economic trends, highly topical. Practice shows that enterprise sector dynamism requires greater attention in relation to the valuation of the companies. There are manifold reasons for such a move.

The findings resulting from the valuation realization are primarily desired for the sale or purchase of company (PriceWaterhouseCoopers, 2015). Other valuation motives include acquisitions, mergers, enterprise reorganization, preparation of a strategic plan or carrying out a capital investment such as building a new plant. The need for valuation of the whole company or its part is present also during deciding to invest into research and development, introducing a new product on the market, selling respectively buying intangible assets which may be trademarks. Not least, the reasons are analyzing the value of the equity share, obtaining funding for the project, establishing a joint venture, determining the value of device, property or trademark for business as well as legal purposes, recapitalization of the company, sale of shares, demonstrating adequacy of pledged (in relation to banking and other financial institutions) or ensuring compliance with the requirements under accounting standards as at national same as transnational level.

Incentives listed above represent, in fact, taking a positive attitude to initiate the process of company valuation. This applies to company valuation justification and necessity connected with solving the real company's tasks, too. Mentioned motives are only a part of a large set of other potential incentives leading to the valuation realization. In addition, all of them occur in business practice very often.

The need for high-quality and transparent data disposition in the context of the valuation of assets, liabilities, but likewise the company as a unified entity has currently a growing trend (Ernst & Young, 2014). Devoting a greater interest in the company valuation matter is important to satisfy the more stringent legislation relating to the regulation of capital markets and financial reporting, as well.

The company valuation commencement should be preceded by a detailed understanding what is actually an object of valuation and what exactly the result of that effort should be. Therefore, it is first necessary to formulate the main basis for company valuation.

2 Literature review

Models used for company valuation have been an objective of numerous empirical studies more recently. Dissimilarity in estimations using different models for company valuation explored Lundholm and O'Keefe (2001). The attention was concentrated on the discounted cash flow model and the residual income model. Research stimulus was a contradiction between consistent fundamentals of the both models and inconsistent valuations gained by practitioners and researchers. Authors claimed the appraisals were the same by application of the residual income model and discounted cash flow model in the situations with correct models practice. Consequently, the proper execution problem was identified.

Demirakos, Strong and Walker (2004) undertook to find out which valuation models financial analysts typically apply. They described the valuation practices through exploring 104 reports prepared by analysts. The variant valuation models analysis was adopted. Substantial value characteristics were the crucial target in view of the fact that analysts forecast them and subsequently predictions are implemented to the company valuation. Hypothesis testing showed that analysts' preferences appeared in cash flow based models and earnings based models. Equal findings reached Imam, Barker and Clubb (2008). Considerably significant was the discounted cash flow method. Discounted cash flow model yielded to the investment analysts an inherent flexibility and complex high reliability.

Popularity and frequent use of the discounted cash flow approach confirmed Imam, Chan and Shah (2013) in the recent study. They verified European investment analysts' inclination to the several valuation models. They came to the conclusion that earnings multiples and the discounted cash flow technique were retained as the most often implemented. Likewise Cornell (2013) denoted discounted cash flow method mostly as the choice number one in valuation practice in his paper. However, he declared according to the analysis he completed that the residual earnings approach, representing related income method to the discounted cash flow method, should not be underrated. Cornell highlighted satisfying resistance to parameters' variance, economic indisputability and stabile status of this technique. The question about uncertainty in the valuation established French and Gabrielli (2005). The aim was to solve the integration of some uncertainty types to the discounted cash flow model. Account was taken of the fact that market, inputs and data uncertainty enter to the company valuation.

Analysts' cash flow forecasting reviewed DeFond and Hung (2003). Analysts chose to forecast firm's cash flows in the case when parameters of the financial, accounting and operational nature led to the fact about cash flows benefit in clarifying earnings and considering company rentability. A forecast-cash-flow approach was in the interest viewfinder of various researchers. Lee (2003) in the framework of deciding on the right valuation method remarked that every forecast-cash-flow model is based on the same essential foundation. The focus was given to mentioned valuation methods category considering its major pros and cons. Lee discussed mainly discounted cash flow method from the group of methods based on cash flows prognosis. Summary indicated, among others, discounted cash flows valuations are suitable for international comparable, naturally taking into account particular applications.

Analyst reports scrutinized Asquith, Mikhail and Au (2005). They validated the analysts rendered the latest information in

every equity report and additionally explicated information published earlier. Further, there was not detected correlation between analyst accuracy and selected method for the valuation operations. In the context of cash flow reporting Sharma and Iselin (2003) explored rationality and benefit of reported cash flows. They identified a great helpfulness of the statement of cash flows. Sharma and Iselin favored the reasonability of the cash flow information disclosing. The cash flow reporting utility was sustained also by the confirmed assumption about accuracy. Interpretations considering the accrual information were less accurate than ones based on the cash flow data.

Kazlauskienė and Christauskas (2008) constructed a company valuation model relied on the company value drivers analysis. The categorization of the company value drivers and their adjustment were included. The substance stuck in the drivers influence on value in the valuation running. Proposed model provided not just a final company appreciation, but modeling and subsequent implementing of multiple factors alterations, too. Neifeld (2001) offered macroeconomic model design for valuation. The subject of the research was aimed to patents. Essential acquisition was in the equations forecasting the market share of services as well as products which underlie to patents. The income valuation thesis was applied to the annual net earnings covered by a patent. What is more, few extensions of the model were presented.

In relation with macroeconomic valuation model, the advisory paper was issued whose authors are Reddy, Agrawal and Nangia (2013). They suggested that overwhelming majority of the models for valuation is associated with microeconomic factors. The meaning of macroeconomic factors was highlighted in their study. Authors stimulated appreciation of the company over more frequent macroeconomic aspects usage. The proposal to incorporate the exchange risk, transfer risk, country risk and political risk was put forward. The research was dedicated to standard models, to reconstruction existing methods and to projection new ones. All company valuation approaches were applied to the specific industry sector. Examination included discounted cash flow technique with its reengineering. Lastly, to summarize the findings, comparison of the reviewed models was provided.

Practitioners Gilbertson and Preston (2005) appealed for dealing with the current challenges facing the valuers and valuation services. They took the opinion that thorough comprehension of the individual economic sectors and market segments is the key towards success of professional valuation. Moreover, authors of the study pointed out the trends, threats and opportunities of the valuation profession. Great weight was assigned to the expanding automation of the valuation process same as the products. The necessity to redefine valuation standards in accordance with the actual market requirements was underlined.

Research of Laswad and Baskerville (2007) was oriented to the connection between cash flows and fair-value earnings. They asserted the numerous academic and practical papers examine the importance of cash flow information. There exist many instances the demand to report cash flow statements is warranted by vision to enable evaluation of the earnings quality for cash flow information users. Findings declared correlation between cash flows and realized earnings presented within fair-value.

Cash flows on a quarterly basis were surveyed by French (2013). Discounted cash flow technique was investigator's interest. He supposed the right move is to elaborate classic discounted cash flow model into quarterly discounted cash flow model. Such modification allows, as he stated, calculations with current cash flows. Several useful valuation examples and discounted cash flow model conversions were yielded.

3 Research

As the realized empirical studies showed, the cash flow based models figure among the most common company valuation models. Even more, they are the most preferred in the vast

majority of cases. Favored one is the discounted cash flow method. Except for the eminent cluster of authors and analysts using discounted cash flow approach, there exists an argument (Fernández, 2015) about proper conceptual correctness related just to the methods based on cash flow discounting. These were the reasons for choosing discounted cash flow as a decisive method that was subjected jointly with specific data to further testing.

The value of company (V_c) is defined under the discounted cash flow method by following equation:

$$V_c = \sum \left[\frac{FFCF_t}{(1+WACC)^t} \right] + \left[\frac{FFCF_t(1+g)}{WACC-g} \right] + NOA, \quad (1)$$

where:

FFCF_t is future free cash flow in period t,
WACC is weighted average cost of capital,
g is annual growth rate of future free cash flow,
NOA are non-operating assets.

Weighted average cost of capital is the discount rate in this instance. It expresses the weighted average of opportunity costs - value that investor sacrificed and could gain by investing in the similar investment. The WACC meets (Chaplinsky, 2000) assumed inflation rate, risk given by being in business as well as currency of the cash flow supposed to be discounted. In addition, the WACC should further encompass fitting target weights pertain to the next funding.

The equation introduced below characterizes weighted average cost of capital in more detail:

$$WACC = \sum \left[K_e \left(\frac{E}{V} \right) \right] + \left[K_d (1-t) \left(\frac{D}{V} \right) \right] + \left[K_p \left(\frac{P}{V} \right) \right], \quad (2)$$

where:

K_e are costs of equity,
E is market value of equity,
V is value,
K_d are costs of debt,
t is marginal tax rate,
D is market value of debt,
K_p are costs of preference shares,
P is market value of preference shares.

Mentioned matters about weighted average cost of capital constitute only some of the significant aspects which are contained in WACC. Its important role led to supposition about the indication as the most influential agent in the equation. Thus, this paper assumes the WACC has a crucial impact on the company value development. The postulate applies to the discounted cash flow model. Theoretical suggestions stimulated the investigation.

Calculations were made for the purpose of identification the key variable involved in the company value computation. This corresponds to the primary aim of the research. In other words the goal was to determine the weightiest factor of the discounted cash flow method affecting development of the company value. The subordinate objective was to find out the impact of change associated with each of the elements in the discounted cash flow approach on the change of the resulting company value development.

Method used for enumeration was sensitivity analysis. As Frey and Patil (2002) stated the sensitivity analysis is helpful in detecting the acute spots with control character, organizing preferences regard to the subsidiary eventual studies or acquisition of data, and naturally testing and confirming a formulated model. Respect to the intended objectives of the paper this technique was the most appropriate choice.

Another incentive for inclination to the sensitivity analysis was actuality that it is a greatly often implemented analysis in the company valuation field by researchers. Relevant results have been obtained through various methods for valuation investigation. Findings reached by means of the examination of the discounted cash flow method sensitivity were especially worthwhile.

The validity of company valuation using specifically discounted cash flow approach with sensitivity analysis addition was explored by Steiger (2010). He investigated right discounted cash flow technique building on matter of fact that it is a habitual modern finance's method. Hence, prominence to realize its detailed running principles is notable same as limiting conditions with subsequent aspects.

The merits of closer discounted cash flow method analysis were declared by the very nature of this approach. The point is that prospective information is used. For this reason forecasting is exigency. In principle, numerous prognoses are applied considering individual business as well as overall economic situation. Even slight modifications related to the substantial assumptions lead to capital differences in the value of assessed company. Obviously, it is necessary to identify which preconditions are involved in the calculations. Great importance has also acquaintance of their impact on achieved results. Described impact was analyzed and subjected to sensitivity analysis.

Suitability of the sensitivity analysis using in the company valuation scope, in accordance with examination in this paper, is confirmed over another research that was accomplished by Saputra and Manurung (2014). Discounted cash flow method was implemented. Based on sensitivity analysis, the WACC was studied.

The source of data used for analysis has origin in the paper by Reddy, Agrawal and Nangia (2013). Data were applied in initial calculations of this research and were substituted as inputs. The further calculations were carried out on their basis as well as the following sensitivity analysis. Databases containing financial information, stock exchanges and financial statements served as data sources. Right a highly practical nature of these business statistics led to the choice for desirable data set. A time period for analysis realization in this paper was five years. Selected financial results pertain to manufacturing sector.

The first analysis executed was the descriptive statistics analysis. Table 1 covers the information as mean, median, maximum, minimum, standard deviation, and skewness.

Table 1 Descriptive analysis

	FFCF	WACC	g
Mean	132.53	6.25	0.03
Median	108.40	6.11	0.02
Maximum	214.92	6.68	0.09
Minimum	74.28	5.97	-0.02
Standard Deviation	73.36	0.37	0.05
Skewness	1.32	1.46	0.78

Source: author's calculations

It should be noted that research disposes with restriction. This is in the form of abstracting from non-operating assets even though they are part of the equation (1) which was fundament for discounted cash flow method performance.

Another fact is that consideration needs to be taken in selection of the sector which is decisive for company's business activities, environment, background or economic information. There exist some specifics and divergences among different sectors (see e.g. Labant, 2013; Turisová, 2010) which can subsequently influence data collection, data selection and analysis itself. These various sector specifics should be regarded within achieved results, as well.

4 Findings

The results refer the change in company value caused by changing input factors (Drabíková, 2017). The key input factors were taken into account. Considering that discounted cash flow method was analyzed, the main inputs pertain to this approach. Exactly, these are future free cash flow (FFCF), weighted average cost of capital (WACC) and growth rate in future free cash flow (g). Obtained variations of the company value are reported in Table 2.

Table 2 Percentage changes in company value

	FFCF	WACC	g
-10%	-10.00	20.21	-4.64
-5%	-5.00	9.28	-2.38
0%	0.00	0.00	0.00
5%	5.00	-7.98	2.49
10%	10.00	-14.92	5.12

Source: author's calculations

Reached findings are given in percentages. Such figures expression enables more explicit comprehension of the representations listed below. Range of the interval was defined in which the selected percentage changes covering each principal variable used in the calculation of the resulting company value through the discounted cash flow method are situated. Delimitation is based on the realistic achievement in the factors figures. This holds in particular for WACC and g. Alteration scope is wider for the future free cash flow in practice. Nevertheless, the rates that are in this instance weighted average cost of capital as a discount rate and annual growth rate of future free cash flow acquire standardly values pertaining to the established changes interval. Specifically, interval has a range from -10% to 10%.

To support data transparency, the input factors changes were intended to $\pm 5\%$ and $\pm 10\%$. However, it is very important to note that every increase or decrease in the value of one factor was conducted under the condition of other factors unchanged. Only in these circumstances there is no results skewing. Only the impact of currently investigated factor is reflected on results of the company valuation. Pay attention to this assumption is crucial both in calculating and in interpreting the results with subsequent drawing conclusions.

Findings stated in Table 2 stand on previous calculations that were realized before the actual finishing enumeration. In the first step the value of the company was quantified. Equation (1) was the authoritative tool for this purpose. Next the conversion of every single input variable was initiated pursuant to presumed changes. Modifications represented an accrual of the input value so as its decrement. Subsequently, company value figuring was performed with regard on each individual change. Admittedly, the change of only one factor was accepted. This was the investigated factor. Other factors remained fixed.

The mathematical determination indicating absolute numbers of the changes in company value with reflection of the percentage changes in variables was comprised in the following step. Order to increase transparency the calculations yielding percentage of changes in value of the company were carried out. Such action later facilitated determination of the impact that the given input factor has on the final company value development. Since the variations of the inputs were expressed as a percentage, variations in company value should be expressed as a percentage, too. Findings are presented in Table 2. There is not only the size of changes in value referred. Also their positive respectively negative development compared to the original state is provided.

To describe reached results, the following Figure 1 and Figure 2 are stated. There are depicted findings (exact company value variations in percentage) corresponding to particular main factors changes. The modifications of major factors at 10%

decrease and 5% increase were chosen as an instance for illustration.

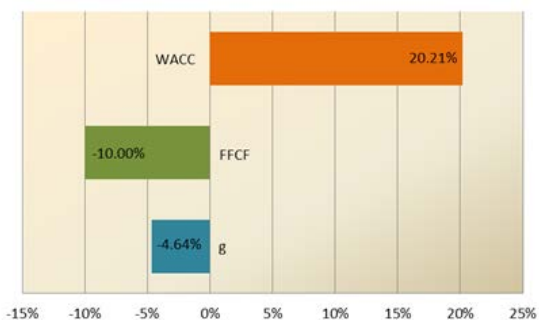


Figure 1 Alteration in company value development due to change of major factors at 10% decrease
Source: author's calculations

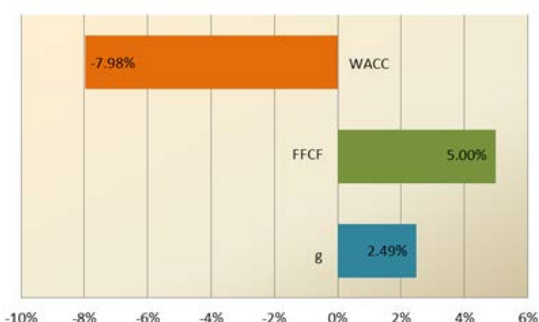


Figure 2 Alteration in company value development due to change of major factors at 5% increase
Source: author's calculations

As can be seen, the weighted average cost of capital has an unambiguous leadership in achieving change of the company value in every factors modification case that was chosen for analysis. Another fact is it's exactly the opposite effect on company value movement as the two remaining variables have. If future free cash flow and growth rate in future free cash flow cause a decline in the value of the company based on their given percentage change, the weighted average cost of capital causes a growth and vice versa. The same pattern applies for relation between weighted average cost of capital and variables stated changes. A reduction in the value of this factor triggers the reverse direction of the company value development. Looking at the weighted average cost of capital, last but not least, percentage alteration in factor value is always smaller than percentage alteration in company value.

Examination proves that the second most influential variable emerging within the discounted cash flow method for company valuation is future free cash flow. The specificity is company value increment/decrement sameness as the factor modification level what has been demonstrated collating with other factors in all exhibited figures above. The direction of future free cash flow change and company value change is the same, as well. There exists thus difference with respect to weighted average cost of capital in every point.

The smallest influence on the change in company value development from tested variables has growth rate in future free cash flow. Therefore, the last bar belongs to this variable in each and every tornado graphs view. Achieved figure signifying change of the company value is consistently minor than figure testifying about factor change. Calculations supported by depiction also indicate identical conversion direction considering growth rate and company value. If the change of growth rate in future free cash flow entails its increasing, there is an increase in the value of the company as well as factor value diminishing

heads to the drop of the company value. Comparison with previously analyzed factors shows some common characteristics either with weighted average cost of capital or future free cash flow. Reflecting on weighted average cost of capital, the joint feature is disproportional relation between variable and company value change. The similarity with future free cash flow can be found in the same direction of variable value and company value movement after particular change realization.

The effects of changing the individual factors value by the specified percentage on the company value development are depicted all together in Figure 3. The horizontal axis represents modifications of factors and vertical axis represents consecutive modifications of company value movement.

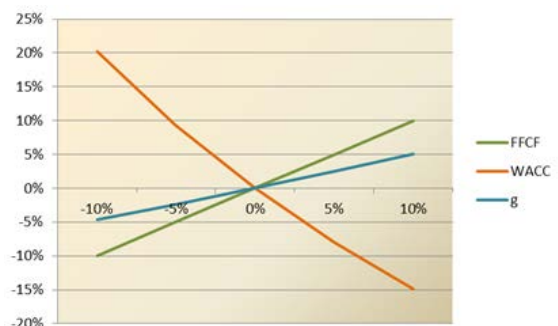


Figure 3 Modified factors indication considering the influence on company value
Source: author's calculations

Looking at Table 2 and Figure 3 where complex findings are reported, Table 2 serves better for the concrete figures review. However, the other supporting information is not so obvious. This concerns curves direction as well as inclination. Such purpose is finer accomplished through transparent visualization in Figure 3.

Figure 3 outlines existing proportionality between value of the company and selected factor. By analyzing relation of the future free cash flow and company value, there is a direct proportionality. This matches with the instance of growth rate, too. Contrariwise, the indirect proportionality can be found between company value and weighted average cost of capital.

The previous fact binds to curves direction. Next additional information that Figure 3 offers is curves inclination. The steepest slope of the curve is noticed at the weighted average cost of capital. Another in sequence is the future free cash flow. The curve reflecting the slightest slope belongs to the growth rate in future free cash flow. In matter of fact, curve inclination indicates the importance degree of the variable represented by the given curve. The biggest influence on the change of company value development has thus factor with the steepest curve slope. Undoubtedly it is the weighted average cost of capital. Based on this criterion, the second most significant variable is future free cash flow. The smallest significance shows growth rate.

5 Conclusion

The topic of valuing the companies or their parts shows a dynamically developing growing trend. This concerns both the private sector and the public sector. In the practice, there exist various methods for company valuation. The paper dealt with discounted cash flow method.

The primary aim of the research was determination the key variable involved in the company value calculation using stated discounted cash flow approach. The subordinate objective was to identify the impact of change associated with each of the agents in the selected approach on the change of the resulting company value development. Method used for computation and fulfillment of defined objectives was sensitivity analysis.

Relevance in connection with choice of the tested approach, utilized method for this purpose as well as data sources rely on already realized research and empirical studies. The fundamental supposition was that weighted average cost of capital has a principled impact on the company value development.

Results of the analysis were reached through changing input factors values that caused change in company value. The whole testing was subordinated to the condition that every increase or decrease in the value of one variable was conducted under the condition of other variables unchanged. The main discounted cash flow method's factors were considered. These were future free cash flow, weighted average cost of capital and growth rate in future free cash flow.

Examination confirmed the initial assumption. The weightiest factor of the discounted cash flow approach affecting development of the company value was weighted average cost of capital. The primary goal was thus accomplished. What is more, this variable had exactly the opposite effect on company value movement as two remaining variables. Discussing relation between company value and particular factor value, a direct proportionality exists in the growth rate case as well as future free cash flow case. An indirect proportionality can be found in the weighted average cost of capital instance. Another finding is that percentage alteration in weighted average cost of capital value was always smaller than percentage alteration in company value.

Research further proved that the second most influential variable emerging within the discounted cash flow method for company valuation is future free cash flow. Uniqueness lay on, in compare with other studied components, figures uniformity of the company value modification grade and factor modification grade. The degree of individual factor importance is explained not only by the calculations but also by the slope of the curve representing this factor what is summarily depicted in Figure 3. Therefore, the most eminent influence on the company value development conversion has factor with the steepest curve slope. The weighted average cost of capital took the first place, then was the future free cash flow and the last one the growth rate. This order is identical to the results of the calculations.

Looking at findings consequent from various authors work, they are similar to the findings in this paper. In general it can be stated that the weighted average cost of capital has leadership in achieving change of the company value when considering application of the discounted cash flow method as principle for valuation. For that reason, the focus should be on paying more attention to its calculations, related previous analyzes and input data, as well. Even the slight inaccuracy, incompleteness or simplification can cause a quite capital differences in the final value of assessed company.

Although mentioned factor appeared as the most influential in majority studies dealing with this topic, there emerged some exceptions. Such a knowing opens the question why is that so. Further research is instigated also by potential benefit resulting from deeper analysis of components included in the weighted average cost of capital itself (see equation 2). Take a closer look on these individual variables through application on data of the picked company / companies could bring some interesting insights. Another possibility for next investigation is testing and consequential comparing with results for different sectors.

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Primary Paper Section: A

Secondary Paper Section: AH

RECENT ADVANCES AND EMERGING APPLICATION CHALLENGES OF FEATURE SELECTION FOR VIRTUAL LEARNING

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Abstract: The use of data mining procedures for decision making has been increasing in the past decades in identifying students' behavior and use of knowledge available in university is a great concern to the e-learning or virtual learning higher education system is increased and the big data phenomenon is also growing from the dawn of time up to 2003 people produced a total of 5 exabytes of data and by 2008 this figure had increased to 14.7 exabytes. These days 5 exabytes of data is produced every 2 days. Its acceptance can be credited to improved applying data mining algorithms, increased performance in different educational systems, and results which can be measured and applied for decision making. The current use of data mining methods to analyze various types of data has shown great advantages in various application domains and particularly in education domain. While some data sets need little preparation to be mined, whereas others, high-dimensional data sets, need to be preprocessed in order to be mined due to the complexity and inefficiency in mining high dimensional data processing. Feature selection or attribute selection is one of the techniques used for dimensionality reduction. Previous research has shown that data mining results can be improved in terms of accuracy and efficacy by selecting the attributes with most significance. A teacher or an artificial instructor, in an education system is embedded with an intelligent tutoring system, is interested in predicting the performance of their students to better adjust the educational materials and strategies throughout the learning process. This research work analyzes different student's performance in different categories of their entire learning process of the course. The purpose of this research work is to find a model that better classifies existing students to improve their grades and the teachers to improve their teaching methodology process to get better results in virtual learning or e-learning. In this research work few different feature selection methods such as Correlation Based Feature Selection, Information Gain, Relief-F, Wrapper, and Hybrid methods were used to reduce the number of features or attributes in the data sets are compared. The data sets with the attributes selected were run through the popular classification algorithms like Decision Trees, k-Nearest Neighbor, and Support Vector Machines, and the results are compared and analyzed.

Key words: virtual learning, Support Vector Machines, e-learning

1 Introduction

Nowadays, as computing power rises and changes cheaper, a new trend playing a significant role is to mine the data for unknown patterns and to extract data that is formerly unknown that may be useful to improve the decision making process (H. Liu, H. Motoda, 2007).

Knowledge Discovery in Data (KDD) - The field of Knowledge Discovery in Databases (KDD) has grown in the past several decades as more industries find a need to find valuable information in their databases. The KDD process (Fayyad, Piatetsky-Shapiro, & Smyth, 1996) is broken down into five phases:

- Selection - The first stage consists of collecting data from existing sources to be used in the discovery process. The data may come from single or multiple sources. This may be the most important stage since the data mining algorithms will learn and discover from this data.
- Preprocessing - The main goal of this stage is to make the data more reliable. Methods used to account for missing data are analyzed and implemented. Dealing with noisy data or outliers is also part of this stage.
- Transformation - Now that we have reliable data we can make it more efficient. The uses of feature selection methods to reduce dimensionality and feature extraction to combine features into new ones are implemented at this point. Discretization of numerical attributes and sampling of data are also common tasks performed in this stage.

- Data Mining - Before the data is mined, an appropriate data mining task such as classification, clustering, or regression needs to be chosen. Next, one or several algorithms specific to the task, such as decision trees for classification, must be properly configured and used in the discovery of knowledge. This process is repeated until satisfying results are obtained.
- Evaluation - The last step is the interpretation of results in respect to pre-defined goals. A determination is made if the appropriate data mining model was chosen. All steps of the process are reviewed and analyzed in terms of the final results. This study concentrates in two critical areas of the KDD process; transformation by reducing the feature set and the data mining process.

2 Literature Review

In recent years, most creativities and establishments have stored large amounts of data in a regular way, but without a clear idea of its potential helpfulness. In addition, the growing acceptance of the Internet has produced data in many different presentations (text, multimedia, etc.) and from many different foundations (systems, sensors, mobile devices, etc.). To be able to extract useful information from all these data, we require new study and processing tools. Most of these data have been produced in the last few years as we continue to produce quintillions of bytes daily (Z.A. Zhao, H. Liu, 2011). Big data large volumes and ultrahigh dimensionality is now a recurring feature of many machine learning application fields, such as text mining and information retrieval (L. Yu, H. Liu, 2004).

In (C. Boutsidis, P. Drineas, M.W. Mahoney, 2009.), for example, conducted a study of a collective email junk riddling task with loads of unique features, whereas the study in (V. Roth, T. Lange, 2003) was based on a wide range of artificial and real world datasets of tens of million data points with features. The growing size of datasets raises an interesting challenge for the research community. In (R. Leardi, A. Lupiáñez González, 1998) the research "our task is to find a needle in a haystack, teasing the relevant information out of a vast pile of glut". Ultrahigh dimensionality implies massive memory requirements and a high computational cost for training. Generalization capacities are also undermined by what is known as the "curse of dimensionality". According to research in (D. Paul, E. Bair, T. Hastie, R. Tibshirani, 1995), Bellman coined this colorful term in 1957 to describe the difficulty of optimization by exhaustive enumeration on product spaces. This term refers to various phenomena that arise when analyzing and organizing data in high-dimensional spaces (with hundreds or thousands of dimensions) that do not occur in low-dimensional settings. A dataset is usually represented by a matrix where the rows are the recorded instances (or samples) and the columns are the attributes (or features) that represent the problem at hand. In (M. Pal, G.M. Foody, 2010) order to tackle the dimensionality problem, the dataset can be summarized by finding "narrower" matrices that in some sense are close to the original. Since these narrower matrices have a smaller number of samples and/or features, they can be used much more efficiently than the original matrix. The process of finding these narrow matrices is called dimensionality reduction.

Feature extraction is a dimensionality reduction technique that addresses the problem of finding the most compact and informative set of features for a given problem so as to improve data storage and processing efficiency. Feature extraction (H. Liu, R. Setiono, 1995) is decomposed into the steps of construction and selection. Feature construction methods complement human expertise in converting "raw" data into a set of useful features using preprocessing transformation procedures such as standardization, normalization, discretization, signal enhancement, and local feature extraction. Some

construction methods do not alter space dimensionality, while others enlarge it, reduce it or both.

It is crucial not to lose information during the feature construction stage. In (R.O. Duda, P.E. Hart, D.G. Stork, 1999) recommend that it is always better to err on the side of being too inclusive rather than run the risk of discarding useful information. Adding features may seem reasonable but it comes at a price: the increase in the dimensionality of patterns incurs the risk of losing relevant information in a sea of possibly irrelevant, noisy or redundant features. The goal of (J.R. Quinlan, 1986) feature selection methods is to reduce the number of initial features so as to select a subset that retains enough information to obtain satisfactory results. In a society that needs to deal with vast quantities of data and features in all kinds of disciplines, there is an urgent need for solutions to the indispensable issue of feature selection. To understand the challenges that researchers face, the next section will briefly describe the origins of feature selection and recent contributions.

Feature selection is defined as the process of detecting relevant features and discarding irrelevant and redundant features with the goal of obtaining a subset of features that accurately describe a given problem with a minimum degradation of performance (Kononenko, 1994). Theoretically, having a large number of input features might seem desirable, but the curse of dimensionality is not only an intrinsic problem of high-dimensionality data, but more a joint problem of the data and the algorithm being applied. For this reason, researchers began to select feature in a pre-processing phase in an attempt to convert their data into a lower-dimensional form.

The first research into feature selection dates back to the 1960s (Guyon, 2006). In (Y. Zhai, Y. Ong, I. Tsang, 2014) used a general parametric model to study the accuracy of a Bayesian classifier as a function of the number of features, concluding as follows: "Dimension selection, reduction and grouping are not proposed as developed techniques. Rather, they are illustrative of a agenda for further investigation". Since then, research into feature selection has posed many challenges, with some researchers highly skeptical of progress. In (M. Tan, I.W. Tsang, L. Wang, 2014), stated: "If variable elimination has not been sorted out after two decades of work assisted by high-speed computing, then perhaps the time has come to move on to other problems". In the 1990s, notable advances were made in feature selection used to solve machine learning problems (K. Weinberger, A. Dasgupta, J. Langford, A. Smola, J. Attenberg, 2009). Nowadays, feature selection is acknowledged to play a crucial role in reducing the dimensionality of real problems, as evidenced by the growing number of publications on the issue (D.L. Donoho et al., 2000).

The new feature selection methods developed in the last few decades classified as filter, wrapper or embedded methods are based upon the relationship between the feature selection algorithm and the inductive learning method used to infer the model (R. Bellman, 1957). Feature selection methods can also be classified according to individual evaluation and subset evaluation approaches (Guyon, A. Elisseeff, 2003) the former also known as feature ranking assesses individual features by assigning them weights according to relevance, whereas the latter produces candidate feature subsets based on a specific search strategy which are subsequently evaluated by some measure.

Given its ability to enhance the performance of learning algorithms, feature selection has attracted increasing interest in the field of machine learning, in processes such as clustering (B. Bonev, 2010), regression and classification, whether supervised or unsupervised. Of the numerous feature selection algorithms available, several have become particularly popular among

researchers. These widely used methods are part of the state of the art in feature selection. Multivariate methods generally tend to obtain better results than univariate approaches, but at a greater computational cost. There is no one-size-fits all method, as each is more suitable for particular kinds of problems. In a previous work (G. Hughes, 1968), we reviewed the performance of some of these state-of-the-art algorithms in an artificial controlled scenario, checking their efficiency in tackling problems such as redundancy between features, non-linearity, noise in inputs and in output and a higher number of features than samples (as happens with DNA microarray classification).

In (A.J. Miller, 1984) DNA microarrays are used to collect information on gene expression differences in tissue and cell samples that could be useful for disease diagnosis or for distinguishing specific types of tumors. The sample size is usually small (often less than 100 patients) but the raw data measuring the gene expression enmasse may have from 6000 to 60000 features. In this scenario, feature selection inevitably became an indispensable preprocessing step.

Image classification has become a popular research field given the demand for efficient ways to classify images into categories. The numerical properties (A.L. Blum, P. Langley, 1997) of image features are usually analyzed to determine to which category they belong. With recent advances in image capture and storage and Internet technologies, a vast amount of image data has become available to the public, from smartphone photo collections to websites and even video databases. Since image processing usually requires a large amount of computer memory and power, feature selection can help reduce the number of features needed in order to be able to correctly classify the image.

The filter method of feature selection is a common choice, mainly due to its low computational cost compared to the wrapper or embedded methods. In (M. Dash, H. Liu, 1997) presented a method based on the physical meaning of the generalized Fisher criterion in order to choose the most discriminative features for recognition. In (R. Kohavi, G.H. John, 1997) proposed a novel method for choosing a subset of original features containing the most essential information; called principal feature analysis (PFA), it is similar to principal component analysis (PCA) methods. Even after this preprocessing step, the number of possible words in a document may still be high, so feature selection is paramount.

A number of techniques have been developed and applied to this problem in recent years. In (V. Bolón-Canedo, N. Sánchez-Marroño, A. Alonso-Betanzos, J.M. Benítez, F. Herrera, 2014) proposed a novel feature selection metric, called bi-normal separation (BNS), which is a useful heuristic for increased scalability when used with wrapper techniques of text classification. In (P.P. Ohanian, R.C. Dubes, 1992) applied several novel feature selection methods to clustered data, while in proposed an unsupervised feature selection strategy that theoretically guarantees the generalization power of the resulting classification function with respect to the classification function based on all the features.

As stated at the opening of this research work, constant advances in computer based technologies have enabled scholars and engineers to collect data at an increasingly fast pace. To address the challenge of analyzing these data, feature selection becomes an imperative preprocessing step that needs to be adapted and improved to be able to handle high dimensional data. We have highlighted the need for feature selection and discussed recent contributions in several different application areas. However, in the new big data scenario, an important number of challenges are emerging, representing current research trends in virtual learning also. The feature selection process is shown in figure 1.

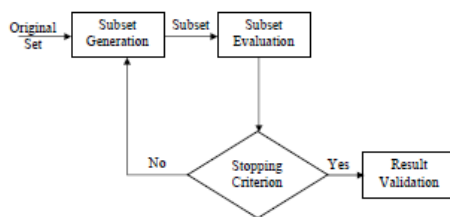


Figure 1: Feature selection process

3 Methodology

This study is a comparative analysis of feature selection methods on classification systems in a real domain setting. As with any data mining exercise, before the data are mined, several key steps need to be performed. These steps, referred to as the preprocessing stage, will account for dealing with missing values, balancing data, discretizing or normalizing attributes depending on which algorithm is used, and finally minimizing the dimensionality of the data set by reducing the number of features with different feature selection methods. The CRISP-DM framework breaks down the data mining process into six phases:

- Understanding the business process and determining the ultimate data mining goals
- Identifying, collecting, and understanding key data sources
- Preparing data for data mining
- Selecting which modeling technique to use
- Evaluating and comparing results of different models against the initial goals
- Deploying Model

Big Data provides teachers with highly relevant information, but we must not forget that it also brings benefits to students. For instance, if one of the benefits is that educators are able to produce better teaching materials to meet their learning patterns, the student will benefit from it as well, that is, if a student is presented with the information in a meaningful way he or she is going to be more motivated in their learning process. Students and participants in eLearning courses have much to gain from the benefits that the information from Big Data provides us. Next, a case study is presented based on the large amount of data collected using a virtual learning environment, where it is shown how eLearning and Big Data form a binomial that must be considered in the future to improve the knowledge society.

The use of these LMS in education eLearning involves generation of a large and complex set of data. These data obtained from the use by many users of the different technological tools in a virtual learning platform can be drawn great benefits to improve eLearning education. How can one profit in the learning context from Big Data? Everyone interested in eLearning education wants to find the answer to this question. Ambrose pointed to the company in collaboration with IBM Skillsoft how big data can help create a learning experience more personalized and adaptive based on real information about each student. So, the study on the use of personal data can be applied perfectly to eLearning. It offers us the opportunity to learn more about our students and their behavior patterns in a way not known before. Moreover, we can use this knowledge to develop eLearning courses really geared to the needs of our students through scenarios that meet their real situations.

Big Data offers us the opportunity to provide students with more efficient courses and more effective on-line learning modules which are attractive and informative. The reasons why large amounts of data can revolutionize the industry of eLearning are:

It allows eLearning professionals design more customized eLearning courses. If you give eLearning professionals the opportunity to learn what works best for their students, in terms of content and delivery, this will allow create more personalized and attractive eLearning courses, thus providing high quality and meaningful learning experience.

It provides counseling on effective online strategies. ELearning big data can give us visions of which eLearning strategies work and which do not. It allows the monitoring of students' patterns. With large data eLearning, educators gain the ability to track the students throughout the learning process. This helps them to find out patterns that not only will allow them to learn more about the behavior of each pupil, but also of the group of students as a whole.

It enables the possibility to expand our understanding of the process of virtual learning. It is essential that eLearning professionals get to know how students learn and acquire knowledge. Big Data gives us the opportunity to gain a deeper understanding of the process of eLearning and how students are responding to the eLearning courses. This information can be used to design new learning methods. Big Data provides teachers with highly relevant information, but we must not forget that it also brings benefits to students. For instance, if one of the benefits is that educators are able to produce better teaching materials to meet their learning patterns, the student will benefit from it as well, that is, if a student is presented with the information in a meaningful way he or she is going to be more motivated in their learning process. Students and participants in eLearning courses have much to gain from the benefits that the information from Big Data provides us. Next, a case study is presented based on the large amount of data collected using a virtual learning environment, where it is shown how eLearning and Big Data form a binomial that must be considered in the future to improve the knowledge society.

This researched used this framework and provided a structured way to conduct the experiments used in this comparative study. Therefore, it improved the validity and reliability of the final results.

Big Data offers us the opportunity to provide students with more efficient courses and more effective on-line learning modules which are attractive and informative. The reasons why large amounts of data can revolutionize the industry of eLearning are:

- It allows eLearning professionals design more customized eLearning courses. If you give eLearning professionals the opportunity to learn what works best for their students, in terms of content and delivery, this will allow create more personalized and attractive eLearning courses, thus providing high quality and meaningful learning experience.
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will allow them to learn more about the behavior of each pupil, but also of the group of students as a whole.

- It enables the possibility to expand our understanding of the process of virtual learning. It is essential that eLearning professionals get to know how students learn and acquire knowledge. Big Data gives us the opportunity to gain a deeper understanding of the process of eLearning and how students are responding to the eLearning courses. This information can be used to design new learning methods.

4 Conclusion

Feature selection has been usually used as a preprocessing step that condenses the extents of a problematic and advances classification precision. The need for this kind of technique has improved intensely in recent years in order to cope with situations categorized by both a high number of input features and/or of models. In other words, the big data bang now has the added problem of big dimensionality. This research work assessed the main need for feature selection and momentarily revised the most popular feature selection methods and some typical applications that are used for virtual learning in higher education. While feature selection may well be one of the improved preprocessing methods, it is vital not to overlook the factors affecting feature selection choices. For illustration, it is important to choose a satisfactory discretization method, given that some feature selection approaches especially those from the information theory field were developed to work with separate data. Certainly, it has been established that the choice of method affects the results of the feature selection process in virtual learning.

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Primary Paper Section: A

Secondary Paper Section: AO, AM

THE PROCESS OF FINANCIALIZATION IN THE EURO AREA

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Abstract: Financialization is a process of increasing the importance of the financial sector in the economy. The first signs of this increase were noticed in the 1950s. Financialization causes many effects – positive and negative – in the economy. The objective of the article is to show the process of financialization in the euro area countries. Therefore, the author used four indicators, which are related to the growth of the financial sector. Finally, an attempt was made to determine the regularities regarding the process of financialization in a selected group of countries.

Keywords: financialization, process of financialization, financial sector, euro area.

Introduction

Financialization is an inseparable element of the economy in the 21st century. The process of financialization is visible in the growth of the role of the financial sector. These changes have many positive and negative effects. The impact of the process of financialization depends on many factors. The determination of the strength of its impact often varies depending on the country which is being studied. The objective of the article is to show the growth of the financial sector in the countries of euro area.

It is important to indicate the significance of the finance sector in both the individual countries and the entire euro area. This will help to indicate the impact of financialization on the economies of the studied countries and the entire group. The author has made an indicator analysis that may show the size of the financial sector and its share in the economy.

1 The definition of financialization

Generally financialization means an excessive growth of the financial sector. This applies to both economic and social life. Literature describes this phenomenon as a growing advantage of the financial sector and its entities over other sectors and their units in the economy¹.

There are several terms for the growing importance of the financial sector in the economy. Many of them refer directly to the part of the sector affected by financialization. Terms such as "stock-exchangization", "bankization", "financial capitalism"² are used in this case.

Financialization is difficult to define with only one definition. In the literature there are process descriptions that refer to different areas of its impact. Below there are a few of them.

T. I. Palley thinks that financialization is an increasing importance of categories related to finances. These categories include markets, motives, institutions and elites that have a role in the operating of the economy and the managing of its institutions. This applies to both national and supranational levels³.

According to S. Dallyn, the process of financialization means the expansion of credit money, which is available to a growing part of the society. It is also the process of opening new and converting old loans and credits into derivative financial instruments. This mainly applies to derivatives and securitization⁴.

M. Ratajczak applied a different approach of defining financialization. In his opinion, financialization should be determined in two perspectives: narrow and wide ones. In the narrow perspective, there is an increase in the activity of non-financial entities on the financial market. In the wide perspective, financialization is the process of releasing the financial sphere from the real sphere. It is also a process of achieving advantage of the financial sphere, an increase in the importance of markets and elites of this sphere in the achieved effects of management⁵.

G. Gołębowski and P. Szczepankowski believe that financialization is a progressive superiority of the financial sector over the activity of economic units that operate in other sectors of the economy. It also concerns mechanisms of the impact of the financial sphere on the real sphere⁶.

2 History of events preceding the process of financialization

The foundation of the philosophy leading to creation of financialization was a new approach to the economy which was defined in the 1950s. The economy was perceived through risk and profitability. Over the next years, this approach has been disseminated⁷.

The perception of the economy by risk and profitability resulted in the disappearance of system security. It resulted in the implementation of new financial instruments that were beyond the control of central banks in the early 1960s. Commercial banks introduced innovative currency exchange tools that included the exchange of US dollars (USD) into euros. Next instruments concerned the conversion of the euro to other currencies of European countries⁸. These events resulted in the decreasing impact of Bretton Woods system.

In the 1970s, there was a significant change in the financial sector. The years 1971-1973 included the collapse of Bretton Woods system, which allowed the exchange of the national currency for US dollars at a stable price. The guarantee of the price was the convertibility of the US dollar into gold. The collapse of the system caused instability in the market. Therefore, the market was directed towards flexible exchange rates. The guarantee of a stable course, which was gold, disappeared. These events caused uncertainty in the financial market, which resulted in the growing costs of investment security. New financial instruments were introduced in order to lower the cost of collateral. The trade of these instruments was done on new markets⁹. The first derivatives market was established in 1972. It was Chicago Mercantile Exchange¹⁰.

The collapse of Bretton Woods system and the increase in derivatives markets contributed to the increased importance of the financial sector in the economy. At the same time, the role of financial market participants increased and the topic of finance became a media one. During this period, sociologists introduced the term of "financialization", which describes the process growing importance of the financial sector¹¹.

The economic crisis of 2007 has been one of the largest events of this kind to the economy since the 1930s¹². During the crisis

⁵ Ratajczak M., *Ekonomia w dobie finansyzacji gospodarki*, [w:] Ruch prawniczy, ekonomiczny i socjologiczny, Rok LXXVI – zeszyt 2 – 2014.

⁶ Gołębowski G., Szczepankowski P., *Finansyzacja gospodarki krajów Europy Środkowo-Wschodniej*, [w:] Ruch prawniczy, ekonomiczny i socjologiczny, Rok LXXVII – zeszyt 4 – 2015.

⁷ Szczepankowski P., *Wpływ zarządzania wartością na finansalizację przedsiębiorstw*, [w:] Zeszyty naukowe Uniwersytetu Szczecińskiego: *Finanse, rynki finansowe, ubezpieczenia* nr 73, Nr 854, Szczecin 2015, s. 497.

⁸ Dembinski P. H., *Finanse po zawale – Od euforii finansowej do gospodarczego ładu*, wydawnictwo Studio Emka, Warszawa 2011, s. 40.

⁹ Vogl J., *Taming Time: Media of Financialization*, [w:] Grey Room 46, Inc. And Massachusetts Institute of Technology, 2012, s. 73-75.

¹⁰ Ibidem, s. 73-75.

¹¹ French S., Leyshon A., Wainwright T., *Financializing Space, Spacing Financialization*, [w:] ESRC Financialization of Competitiveness Seminar, 2008, s. 3.

¹² Gkanoutas-Leventis A., Nesvesailova A., *Financialisation, oil and the Great Recession*, [w:] Energy policy 86 (2015), s. 892.

¹ Gołębowski G., Szczepankowski P., *Finansyzacja gospodarki krajów Europy Środkowo-Wschodniej*, [w:] Ruch prawniczy, ekonomiczny i socjologiczny, Rok LXXVII – zeszyt 4 – 2015, s. 197.

² Ratajczak M., *Finansyzacja gospodarki*, *Ekonomista* Nr 3/2012, s. 281-282.

³ Palley T. I., *Financialization: What it is nad Why it Matters?*, Macroeconomic Policy Institute (IMK) in the Hans-Boeckler-Foundation Workin Paper 04/2008, 2008.

⁴ Dallyn S., *Innovation and financialisation: Unpicking a close association*, [w:] *Epherema: theory& politics in organization* V.11(3), 2011.

there was a sudden collapse on the financial markets. The reason for this was the excessive creation of credit money. An additional element, which drove the process was the new financial instruments. These instruments were created on the basis of debts of financial institutions. As a result of these activities, there was the problem of credit money looping. The effects of the crisis drew people's attention to the significant overgrowth of the financial sector in the economy¹³. The financial crisis showed the large role of the financial sector in the economy¹⁴.

In the modern form of capitalism, economic crises cease to be exceptions. They become phenomena that occur with a certain regularity. Each crisis proceeds in a different way and is caused by various factors. Reason for one crisis may be seen in excessive financing of households with credit money, cause of another crisis may be a liquidity problem among enterprises. Despite various reasons and courses of action, crises have one common element which is the overgrowth of the financial sector - financialization¹⁵.

3 The financialization process in the euro area countries

3.1 Materials and methods

The process of financialization is determined by the growing importance of the financial sector and its variables. In order to indicate their significance for the whole economy, several indicators were applied. The used indicators concern the most important elements of the financial sector.

The following indicators were used in the study:

- ratio of the budget balance to GDP;
- ratio of financial transaction assets to GDP;
- ratio of employment in the financial sector to total employment;
- ratio of household debt to household income.

The indicators from above will allow determining increase in indebtedness of the economy as well as households. They will make it possible to indicate the participation of the financial sector in the economy. In order to obtain a thorough analysis of the financialization process, other indicators should also be taken into account, such as: the balance of financial and capital flows, salaries in the financial sector to wages, ratio of investment in the economy to GDP.

3.2 Results

Financialization can be examined by indicators which determine the level of given economic values in relation to the size of the economy. The author used four indicators: the ratio of budget balance to GDP; ratio of financial transaction assets to GDP; ratio of employment in the financial sector to total employment; ratio of household debt to household income.

In order to facilitate the interpretation, the results are divided into three groups:

- countries that joined the euro area in 2002 - countries that joined the euro area at the time of its creation;
- countries that joined the euro area after 2002 - countries that joined the euro area in the following years;
- the euro area (19 countries).

Charts 1 to 3 indicate the ratio of the budget balance to GDP. This indicator shows the share of budget surplus or deficit in GDP. In this way, it can be seen if the country tends to spend too

much money. It is also possible to determine the tendency for the government to indebted the economy.

Chart 1. presents the ratio of the budget balance to GDP in the countries that joined the euro area in 2002. In most countries, this indicator has a negative value. This means that these countries apply a budget deficit policy. Ireland and Greece are most likely to have a large budget deficit. The expenditure is partially financed from external sources. It supports the growth of the financial sector.

Chart 2. shows ratio of the budget balance to GDP in countries that joined the euro area after 2002. In the majority of these countries this indicator is characterized by a negative value. Most countries that joined the euro area after 2002 have a negative budget balance. Its ratio to GDP is usually around 3-4%. In the years 2014-2015, Cyprus and Malta had the lowest ratio of the budget balance to GDP. A negative budget balance means that countries are willing to incur debt in order to cover the deficit.

Chart 3. presents the ratio of budget balance to GDP in the euro area, which consists of 19 countries. The indicator has had a negative value since the beginning of the studied period. In the years 2007-2016 its value ranged between -0.65% and -6.26%. This means that the euro area countries tend to have a budget deficit. This allows the development of the forms of external financing and the simultaneous increase of the financial sector importance.

In the majority of the surveyed countries as well as in the entire euro area the ratio of the budget balance to GDP is negative. This means that the studied countries apply a loose budget policy that favors the creation of a budget deficit. At the same time, it contributes to the indebtedness of the economy. The result of such activities is the growth of the financial sector.

Charts 4. to 6. present the ratio of financial transactions to GDP. This indicator shows share of financial sector assets in the wealth of the economy. It also allows noticing whether the financial sector is the main element of the economy.

Chart 4. presents the ratio of financial transactions to GDP in the countries that joined the euro area in 2002. In most countries this indicator does not exceed 20%. This means that the financial sector is of great importance in the economies of the surveyed countries. The financial sector is the most important in Ireland. This country also faces large fluctuations in the value of financial.

Chart 5. shows the ratio of financial transactions to GDP in countries that joined the euro area after 2002. In the majority of surveyed countries the indicator does not exceed 20%. This means that operations on the financial market are an important element of the economy. The financial sector is the most important in Cyprus and Malta.

Chart 6. presents the ratio of financial transactions to GDP in the euro area (19 countries) and Luxembourg. The graph shows Luxembourg as an example of a country where financial assets in relation to GDP often exceed 1000%. In the case of the euro area, this indicator in the audited period ranged from 6.47% (2008) to 51.39% (2007). In these years there are large fluctuations due to the financial crisis. After the shock related to the crisis, the rate increased. Since 2014 financial assets in relation to GDP have amounted to approximately 20%. This means that the financial sector plays an important role in functioning of the euro area economy. It is important that the role of the financial sector is not decisive.

The ratio of financial transactions to GDP in the surveyed countries and the euro area varies around 20%. This means the financial sector is an important element in the functioning of the economy. In some countries (ie Ireland, Cyprus, Malta, Luxembourg) it plays a very important role in functioning of the economy.

¹³ Pike A., Pollard J., *Economic Geographies of Financialization*, [w:] *Economic Geography* 86(1), 2010, s. 30.

¹⁴ Theurillat T., Corpataux J., Crevoisier O., *Property Sector Financialization: The Case of Swiss Pension Funds (1992-2005)*, [w:] *European Planning Studies* Vol. 18, No. 2, 2010, s. 190.

¹⁵ Roubini N., Mihm S., *Ekonomia Kryzysu*, Oficyna a Wolters Kluwer business, Warszawa 2011, s. 33.

Charts 7. to 9. present the employment relationship in the financial sector to the employment in the entire economy. This indicator allows observing the role of employment in the financial sector in relation to the employment in the economy. The higher the index, the greater the role of the financial sector in the economy. Data for 2017 include results from the second quarter.

Chart 7. presents the ratio of employment in the financial sector to the total employment in the countries that joined the euro area in 2002. In most countries, the ratio varies from 2% to 4%. Only in Ireland this rate is around 5%. A separate case is Luxembourg where the employment of the finance sector is 10% of the total number of employees. This may be due to the specificity of the economy of this country.

Chart 8. presents the ratio of employment in the financial sector to the total employment in the countries that joined the euro area after 2002. In the majority of countries, this ratio is from 2% to 4%. A higher employment in the financial sector occurs in Cyprus (around 5-6%) and Malta (4-5%).

Chart 9. presents the ratio of employment in the financial sector to the total employment in the euro area - all 19 countries. This indicator varies around 3%. This means that the employment of the financial sector is about 3% of the total employment in the euro area countries. In the entire euro area one can observe the decline in the employment of the financial sector.

The employment ratio in the financial sector to the total employment in the surveyed countries ranged from 2% to 4%. In the whole euro area, the indicator varies around 3%. These results mean that the financial sector does not have a decisive role in the employment of employees in the economies of the studied countries. This does not mean that the financial sector does not play an important role in the functioning of the economy.

Charts 10. to 12. present the ratio of the household debt to the household income. Thanks to the indicator, the tendency of households to indebt may be observed. The increase in the financial sector means an increase in the number of products through which it is possible to raise funds. Therefore, the high value of the indicator means that the financial sector is of great importance in the economy of a given country.

Chart 10. presents the ratio of household debt to the household income in countries that joined the euro area in 2002. In most countries, the rate is below 100%. Therefore, households are not willing to indebt themselves above their incomes. Exceptions are households in the Netherlands and Ireland, where the debt is above 150% of revenues.

Chart 11. Presents ratio of the household debt to the household income in countries that joined the euro area after 2002. In most countries this rate fluctuated around 50%. This means that households in these countries are not willing to overburden their income. An exception in this group of countries is Cyprus, in which the household debt has amounted to over 150% of revenues since 2009..

Chart 12. presents the ratio of the household debt to the household income in the euro area (19 countries). Over the period considered, the index exceeded 90%. This means that households in the euro area have over 90% of their income.

The ratio of debt to the household income in the euro area and its member states in most cases does not exceed 100%. Households in the countries that joined the euro area in 2002 have a greater propensity to borrow more than their revenues. A high level of household debt indicates an easy availability of credit money. It is also possible that there are many financial instruments that facilitate borrowing. A high level of the household debt also indicates a large, well-developed financial sector.

4 Conclusions

The process of financialization is an inherent element of the economy of modern states. It is present in many aspects of the economic life. The overflow of the financial sector became visible in the 21st century. The article attempts to determine the importance of the financial sector in the economy by making an index analysis.

In order to verify the research problem, the author compared results of the indicators defining the role of the financial sector in the economy. The following indicators were taken into account during the test:

- the ratio of the budget balance to GDP;
- the ratio of financial transaction assets to GDP;
- the ratio of employment in the financial sector to the total employment;
- the ratio of the household debt to the household income.

The ratio of the budget balance to GDP indicates that the euro area countries are willing to reach a negative level. This means that some budget expenditures are covered by the deficit. In turn, the deficit is financed from external sources. This is an opportunity for the development of the financial sector.

The ratio of financial transactions to GDP in most cases is around 20%. This means that assets derived from financial transactions constitute a significant part of the state's revenue. At the same time, they point to the important role of the financial sector in the economy.

The employment ratio in the financial sector to the employment in the entire economy ranges from 2% to 4% in many countries. This indicator was around 3% during the surveyed period in the entire euro area as well. These results show that the financial sector has a significant share in employment in the entire economy.

The ratio of the household debt to the household income is usually below 100%. This means that households are willing to borrow. On the other hand, they do not indebt themselves above their revenues. The results of this indicator show that there are many instruments on the financial market that allow household loans. This indicates a well-developed financial sector.

The analysis allows concluding that euro area countries have well-developed financial sectors. On the other hand, the level of financialization is not visible in the majority of cases. Some of the surveyed countries tend to have a financialization process. The examples of such countries are Ireland, Cyprus, Greece and Luxembourg. In order to clearly determine the occurrence of financialization, an extended indicator analysis should be performed.

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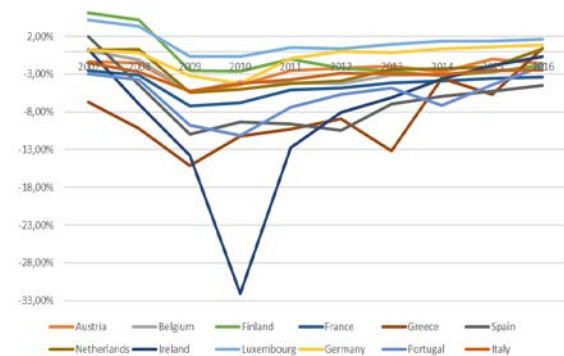
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Primary Paper Section: A

Secondary Paper Section: H

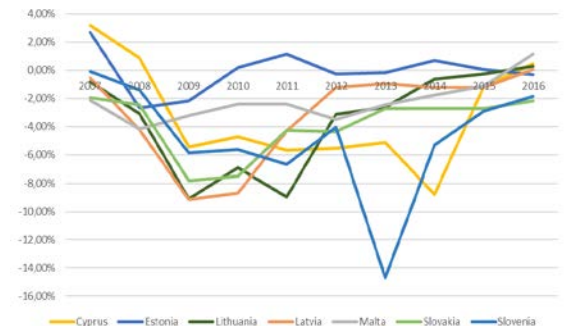
Tables, figures

Chart 1. Ratio of the budget balance to GDP in the countries that joined the euro area in 2002 (in%).



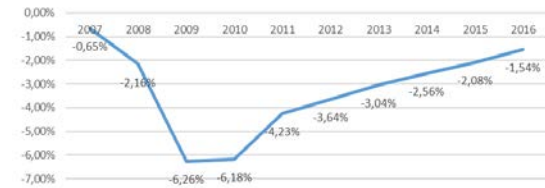
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Chart 2. Ratio of the budget balance to GDP in the countries that joined the euro area after 2002 (in%).



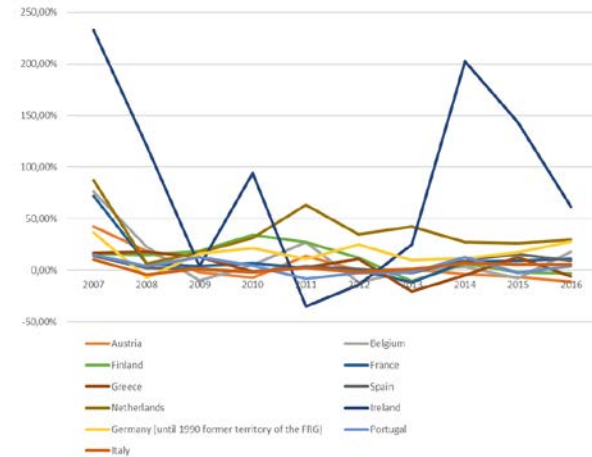
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Chart 3. Ratio of the budget balance to GDP in the countries in the euro area (19 countries) (in%).



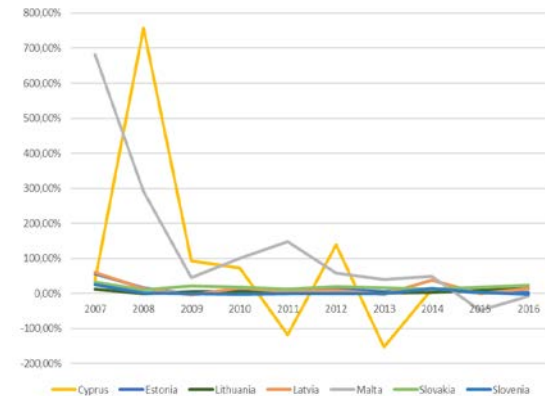
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Chart 4. Ratio of financial transaction assets to GDP in countries that joined the euro area in 2002 (in %).



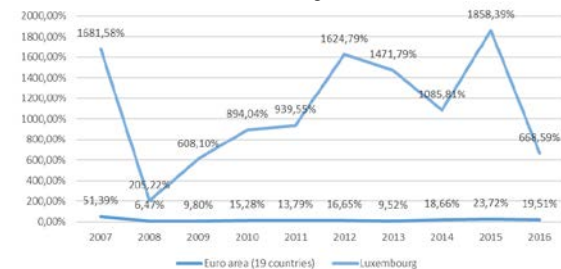
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Chart 5. Ratio of financial transaction assets to GDP in countries that joined the euro area after 2002 (in%).



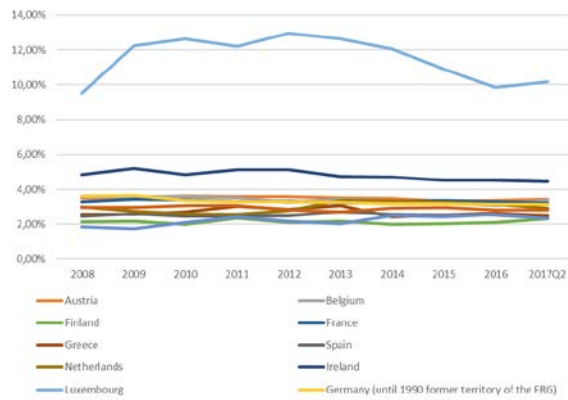
Source: Prepared on the basis of Eurostat Database, ec.europa.eu/eurostat/data/database [access 26/12/2017].

Chart 6. Ratio of financial transaction assets to GDP in the euro area (19 countries) and Luxembourg (in %).



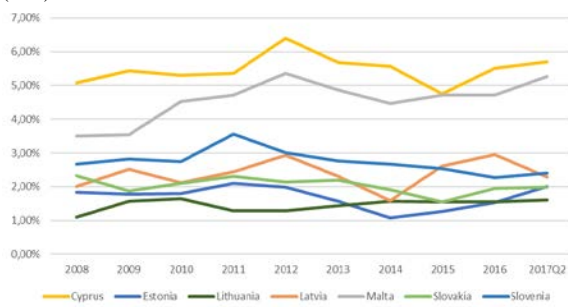
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Chart 7. Ratio of employment in the financial sector to the total employment in the countries that joined the euro area in 2002 (in%).



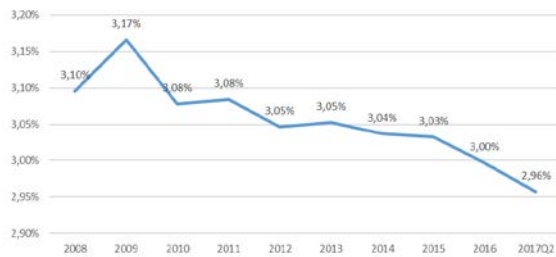
Source: Prepared on the basis of Eurostat Database, ec.europa.eu/eurostat/data/database [access 26/12/2017].

Chart 8. Ratio of employment in the financial sector to the total employment in the countries that joined the euro area after 2002 (in%).



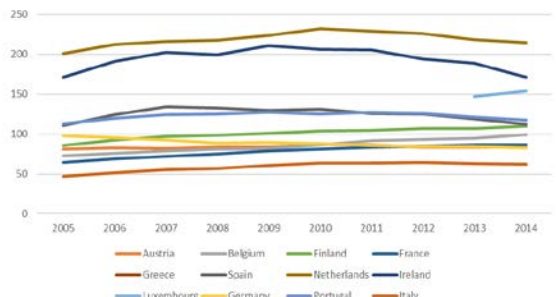
Source: Prepared on the basis of Eurostat Database, ec.europa.eu/eurostat/data/database [access 26/12/2017].

Chart 9. Ratio of employment in the financial sector to the total employment in the euro area (19 countries) (in%).



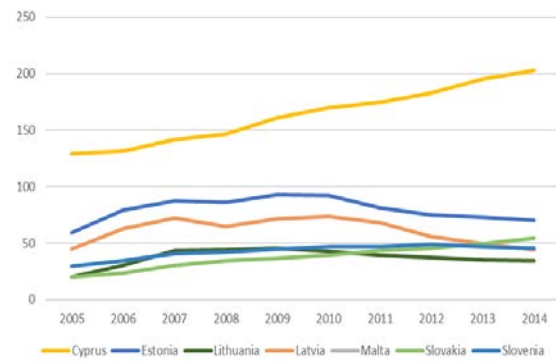
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Chart 10. Ratio of household debt to household income in the countries that joined the euro area in 2002 (in %).



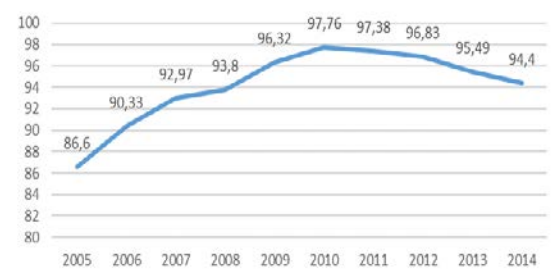
Source: Prepared on the basis of Eurostat Database, ec.europa.eu/eurostat/data/database [access 26/12/2017].

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Chart 12. Ratio of the household debt to the household income in the euro area (19 countries) (in %).



Source: Prepared on the basis of Eurostat Database, ec.europa.eu/eurostat/data/database [access 26/12/2017].

ANTHROPOGENIC AND NATURAL TOXICANTS OF RAW MATERIAL, FOOD PRODUCTS AND MODERN METHODS OF THEIR CONTROL

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Abstract. A continually expanding arsenal of anthropogenic and natural toxicants regulated in raw materials, food products, animal feed, in various veterinary surveillance facilities and food production facilities requires the development and implementation of accelerated methods and test systems that simultaneously determine several safety indicators. The risks associated with the safety of raw materials and food products can be attributed to contamination by anthropogenic or natural toxicants. The first include toxic elements, dioxins, synthetic plant growth regulators, substances used in animal husbandry: medicines (antibacterial, antiparasitic and hormonal drugs), phosphorus-and-chloroorganic pesticides, etc. To the second - toxins and metabolites of bacteria, fungi, plants. In order to prevent these risks, the control of these pollutants is carried out. Solving this problem will help the introduction of promising and highly effective methods. The aim of the work was to carry out an experimental and theoretical evaluation of some methods for accelerated control of anthropogenic and natural toxicants. As a result of the conducted studies, the analysis of international and Russian legal and regulatory documents on the criteria for the safety of raw materials and food products is given. The prospects of methods and test systems based on immunochromatography technology, immunochromatographic indicator elements and PCR in "real time" mode with the use of robotics for accelerated control of anthropogenic and natural toxicants have been experimentally proved. As a result of the studies, the possibility of determining organophosphorus pesticides and pesticides from the class of imidazoles in plant foods and water has been demonstrated, based on the inhibition of acetylcholine-esterase activity with a colorimetric determination of the final result on a vertical photometer as well as immunochromatography technology. It has been shown that immunochromatographic indicator elements with colloidal gold nanoparticles (IIEC) are promising for screening control of natural toxicants: microorganisms, toxins of bacteria and fungi. The high sensitivity of the PCR method in real time mode has been proven, and automation makes it promising for controlling bacteria in raw materials or products, especially for hard-to-grow or dangerous microorganisms (salmonella, campylobacteria, causative agents of anthrax, brucellosis, etc.)

Keywords: toxicants, raw materials, and food products, immunochromatographic indicator elements, polymerase chain reaction, immunochromatography method.

1 Introduction

The decree of the President of the Russian Federation "On the approval of the doctrine of food security" predetermines the intensive development of food production (Decree No. 120 of the President of the Russian Federation of 30.01.2010 "On Approving the Doctrine of Food Security of the Russian Federation" (Electronic resource) // The President of Russia (site). URL: <http://kremlin.ru/events/president/news/6752>). At the same time, it is essential to use high-quality raw materials, which will preserve health for consumers, and, ultimately, will ensure the food security of our country.

The safety of raw materials is primarily determined by the absence of toxic pollutants in it. According to the generally accepted international terminology (ISO / IEC 2, paragraph 2.5), the concept "safety is a state in which there is no unacceptable risk associated with causing harm to the life or health of citizens, property of individuals or legal entities, state or municipal property, the environment, life or health of animals and plants".

The risks associated with the safety of raw materials and food products can be attributed to contamination by anthropogenic or natural toxicants. The first include toxic elements, dioxins, synthetic plant growth regulators, substances used in animal husbandry: medicines (antibacterial, antiparasitic and hormonal drugs), phosphorus-and-chloroorganic pesticides, etc. To the

second - toxins and metabolites of bacteria, fungi, plants. To prevent these risks, the control of these pollutants is carried out.

Meat products are one of the most critical elements of the population's nutrition. The issues of improving methods for assessing the safety of raw materials and products of animal origin, as well as the harmonization of safety criteria with international requirements, are very relevant in the light of technical regulation and integration processes within the framework of the Eurasian Union and the WTO.

Currently, the safety criteria are specified in the Technical Regulations of the Russian Federation and the Customs Union (TR TS 021/2011 "On the safety of food products" (Electronic resource) // Rosstandart (Offic. site). URL: http://www.gost.ru/wps/portal/pages/directions?WCM_GLOBAL_CONTEXT=/gost/gostru/directions/technicalregulation/technicalregulations/teh%20reg%20tc%20o%20bez%20pizh%20prod). However, in them, as well as in the Sanitary Rules and Norms (SanPiN 2.3.2.1078-01), initially not all requirements were fully harmonized with such international documents as the European Union Directives and the Codex Alimentarius. It should be noted that the introduction of the significant additions and changes to date has not been fully completed.

The most significant group of pollutants are the remains of agricultural pesticides. This group includes pesticides (bactericides, fungicides, insecticides, herbicides), fertilizers, plant growth regulators, plant protection products. Pesticides are substances of various chemical nature used in agriculture to protect cultivated plants from weeds, pests, and diseases, among them: organochlorine, organophosphate, carbamate, organomercuric, synthetic pyrethroids and copper-bearing pesticides. Although many of them are currently banned in most countries, they are produced and used for their intended purpose in agriculture. It is impossible to abandon the use of pesticides entirely. Therefore, it is vital to control their production and use, since they are capable of bioaccumulation in plant foods, they can later enter the animal organism and then accumulate in the form of residual quantities in raw materials and animal products. Studies conducted in several countries have shown the presence of residual amounts of pesticides in animals and food (ZheltoVA 2015; Melnikov N.N. 1994; Yaremchuk V.P. Monitoring the content of pesticides in meat raw materials and 2016).

The international criteria for toxicological safety are established in the directives of the European Union (EU), Codex Alimentarius. According to these documents, the content of antibiotics (levomycetin (chloramphenicol), tetracycline group, grazing, bacitracin) is not allowed in meat, meat and meat products, poultry meat and offal); pesticides (hexachlorocyclohexane (alpha, beta, gamma isomers), DDT and its metabolites).

Sanitary Rules and Norms "Food raw materials and food products. Hygienic requirements for the safety and nutritional value of food products" prescribe that animal products are controlled by residual amounts of animal growth stimulants (including hormonal drugs), medicines (including antibiotics) used in animal husbandry for fattening, treatment, and prevention of diseases livestock and poultry. According to Appendix No. 12 SanPiN 2.3.2.1078-01 and the documents of the Joint FAO / WHO Expert Committee on Food Additives and Contaminants, the maximum levels of residues of veterinary (zootechnical) preparations in food products of animal origin are given, where, in particular, the residual amounts of antimicrobial agents, spectinomycin, neomycin, gentamicin, ceftiofur, sulfadimidine, flumequine, lincomycin, thiamphenicol, danofloxacin, spiramycin, sarafloxacin. Remaining quantities of anthelmintic agents - closantel, ivermectin, flubendazole, thiabendazole, triclabendazole, levamisole, febantel, fenbendazole and oxfendazole, moxidectin, doramectin, abamectin, eprinomectin.

In meat, meat products and by-products of slaughter cattle and poultry, fodder antibiotics - grisin, bacitracin, and curative antibiotics, which are most often used in veterinary medicine - antibiotics of the tetracycline group, levomycetin, are approved for use in agriculture. In milk and dairy products, penicillin, streptomycin, tetracycline antibiotics, and levomycetin are controlled.

In connection with the harmonization of safety indicators with international standards and the need to monitor all potential pollutants, a National Laboratory Monitoring Plan for the Remains of Prohibited and Harmful Substances in Live Animals, Animal Products and Feedstuffs has been developed and is being implemented in our country. In particular, Group A (A) - substances that have an anabolic effect and forbidden substances: stilbenes, their derivatives (derivatives), salts and ethers; hydrostatics; steroids; lactones of resorcinic acid, including zeranol; beta - agonists; substances included in Annex V of Council Regulation (EEC) No. 2377/90 of 26 June 1990; chloramphenicol; nitrofurans (including furazolidone); nitroimidazoles. Group B (B) - veterinary medicinal products and environmental contaminants: antibacterial substances, including sulfonamides and quinolones. Other veterinary medicinal products: anthelmintics coccidiostats; carbamates and pyrethroids; sedatives; non-steroidal anti-inflammatory drugs; other pharmacologically active substances; other substances and environmental contaminants: organochlorine compounds, including PCBs; organophosphorus compounds; chemical elements, mycotoxins, dyes, other materials, including non-proprietary medicines that could be used for veterinary purposes (histamine, radionuclides, agrochemicals, microbiological indicators, etc.).

Also in the meat of animals, and the products of its processing, antibacterial and antiparasitic agents can accumulate. Antimicrobial and anthelmintic preparations are widely used in veterinary medicine, and residual amounts of these medicines represent a risk to human health, since they can cause allergic reactions, can lead to the emergence of resistant to these drugs, microorganisms, nematodes and trematodes, and have an adverse effect on the blood and hereditary systems of man and animals. Thus, the control of these residues plays a crucial role in ensuring food safety (Melnikov N.N. 1994).

To natural toxicants of bacterial origin are themselves pathogenic bacteria and the toxins they produce. They contaminate food and cause acute food intoxication.

To determine anthropogenic and natural toxicants, various approaches are used based on physicochemical, microbiological, molecular-biological and immunochemical methods.

The work aimed to carry out an experimental and theoretical evaluation of some methods for accelerated control of anthropogenic and natural toxicants.

2 Methodology

As objects in the validation of test systems based on the inhibition of enzymatic activity "in vitro" and immunochromatographic analysis for screening control of pesticides, samples of plant feed and drinking water from open sources artificially contaminated with organophosphorus pesticides were selected. Preliminary samples were checked by HPLC (High-Performance Liquid Chromatography) for the absence of detectable toxicants. For artificial contamination of samples, standardized diazinon samples were used. The "Abraxis OP / C" test system was used to determine the organophosphorus pesticides. The essence of the method of determination was the inhibition of acetylcholinesterase by organophosphorus compounds and a change in the degree of coloration, which was fixed by the reaction of the enzyme with 5,5'-dithio-bis (2) nitrobenzoic acid. The reaction was carried out in the wells of a plate for enzyme immunoassay. The final result was recorded by changing the degree of staining with a colorimetric determination using a vertical photometer at 405 nm.

Immunochromatographic analysis of the detection of pesticides from the imidazoles class was carried out with the help of the Anthelmintics Array test system using the Evidence investigator semi-automatic chemiluminometer "Randox" (UK).

For experimental confirmation of the use of indicator immunochromatographic elements with colloidal gold nanoparticles (IIHE) for monitoring toxicants in meat raw materials, immunochromatographic indicator elements (IIHE) manufactured by FSUE "State Research Institute of Biological Instrumentation" of FMBA Russia were used.

The subjects of the study to improve the methods of controlling pathogens in raw materials and food products using real-time PCR were - chicken's meat and meat semi-finished products (pelmeni), as well as artificially contaminated *S.typhimurium* samples of these products. Peptone water was used to grow salmonella. Cell destruction and DNA isolation were carried out using a Qiagen EZ1 Advanced XL robotic station using magnetic particle technology, PCR was carried out on a RotorGene® 6000 (Corbett Research) amplifier using the AmpliSens® Salmonella spp. The test system (TsNIE Rospotrebnadzor). By reference methods of identification we used: classical bacteriological analysis and the technique with the miniVidas device.

3 Research results

At present, active physicochemical reference methods exist for the determination of pesticides. However, when carrying out production daily, these methods are very laborious, expensive and require the availability of sophisticated equipment. For screening control of livestock facilities, especially for small businesses and farms, accelerated techniques can be used based on inhibition of enzymatic activity "in vitro" and immunochromatographic analysis. Earlier, it was shown the possibility of applying this approach for the detection of toxicants in honey and critical control points of biotechnological productions (Babunova V.S. 2011, Yarov OA, Svetlichkin VV, Mikhaleva LP, 2010).

One of the research tasks was the validation of test systems based on inhibition of enzymatic activity "in vitro" and immunochromatographic analysis for screening control of pesticides in plant foods and drinking water from open sources.

During the research, adapted techniques were developed. The method for determining organophosphorus pesticides in feeds included: sample homogenization, FOS extraction with double methanol volume, homogenate precipitation by centrifugation at 3500g, dilution and filtration of supernatant through a 0.02 micron filter cartridge and with Anotop 25 Plus fiberglass prefilter, sequential incubation in wells of the plate of the test aliquots of the filtrate with reagents of the test system. Determination of the absorbance of the wells at 405 nm after addition of the Stop Solution. Interpretation of the results was carried out to determine the decrease in the optical density values in comparison with the control. As a blank control sheet, non-contaminated samples of these test subjects were taken, as well as methanol, which was used for the extraction of FOS and dilution of contaminants. In the experiments, an internal negative control was also applied in a 50% solution of methanol.

For the control of water quality, the following modified procedure was developed. Centrifugation at 500g was used for preliminary purification from coarse particles. The redemption from possible low-molecular impurities of protein nature was carried out in the following way: zinc sulfate and potassium ferrocyanide were added to the samples, which are known to form zinc ferrocyanide, which binds proteins well, and are also extracted with FOC by 50 percent methanol. To this end, the water was transferred to a centrifuge tube, successively solutions of Carrez 1, Carrez 2, and methanol was added to a final concentration of 50%, vortexed vigorously after each reagent and centrifuged for 10 minutes at 5000 g and 4-12 ° C 39 - 54 ° F). Aliquots of the sample solutions, after appropriate sample preparation, were added to the wells of the plate and similar

reactions were carried out with the reagents of the Abraxis OP / C test system. Negative control and samples that did not contain FOS in a detectable quantity gave a dark yellow color. The samples containing FOS had a weaker color than the negative control. A 20% color inhibition (decrease in optical density) indicated the presence of FOS in the amount at the detection limit or above. The established detection limits of the OPC made it possible to detect nanogram quantities of the substances to be determined. The sample preparation procedure for analysis with the Anthelmintics Array test system for the detection of imidazoles in feeds included: homogenization, successive addition to acetonitrile homogenate, sodium chloride and anhydrous magnesium sulfate, centrifugation at 2840 rpm for 12 minutes, transferring 5 ml of supernatant to a glass vial, drying at 50 ° C, resuspension in diluted wash buffer. The sample preparation procedure for water was practically the same, except the homogenization procedure.

The essence of the method of immunochromatography consists in the immune reaction "antigen-antibody" occurring between the analyzed liquid sample and antibodies immobilized in the test and control zones, conjugated with colloidal gold. The resulting immune complex under the action of capillary forces moves along the nitrocellulose membrane of the test strip, reaches the analytical zone where it is immobilized by binding to antibodies of the analytical zone. In this zone, a brightly colored "sandwich" of the conjugate of colloidal gold is formed, associated with the desired antigens by specific antibodies

immobilized on the membrane. The presence of two colored bands on the layer of immunochromatographic indicator elements indicates the presence of the desired antigen in the sample. The final result is recorded visually or using an OTDR. Reflectometry allows reducing such factors of subjectivity when evaluating a conclusion by a person, such as a workplace illumination, operator fatigue or individual features of color perception and immunohromatogram line saturation (Yarkov S.P. 2005).

The experimental confirmation of the use of IIHE domestic and foreign production for controlling Salmonella in meat raw materials and food products has been carried out. To manage the meat raw materials for the maintenance of bacteria, a modified procedure has been developed that makes it possible to improve the efficiency of sample preparation and reduce the effect of stained meat elements on the interpretation of the analysis results (Figure 1).

The polymerase chain reaction (PCR) method is compassionate and specific (Higuchi, R., Fockler, C., Dollinger, G., and Watson, R. Kinetic PCR:1993). When using real-time PCR, the amount of time spent in analysis and quantification is significantly reduced. Means for detecting the result in real-time PCR are based on changes in fluorescence, which is proportional to the increase in the amount of PCR product during the reaction. Fluorescence is measured during each PCR cycle, and a graph is constructed based on the measurement data to monitor the progress of the response.

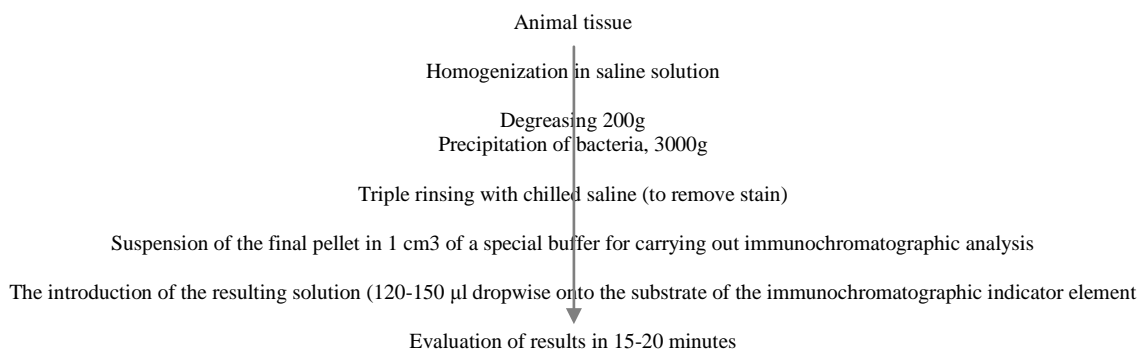


Figure 1: Scheme of a modified method for determining bacteria in animal tissues using immunochromatographic indicator elements with colloidal gold nanoparticles

Studies have been carried out to improve the control of salmonella in poultry meat using real-time PCR and robotics. During the studies, the daily culture of *S. Typhimurium* bacteria before growth in peptone water and seeding of neutral samples was titrated at a factor of 10. A total of 4 dilutions were prepared, where each subsequent dilution contained 10 times less microbial cells than the previous one. So, if in the first dilution there were 1000 microbial cells, then in the last one cells. For the PCR study, the raw material (a mixture of plant cells) and 4 samples of chicken meat artificially seeded with *S. Typhimurium* (25 grams homogenized with 225 grams of peptone water and the addition of *S. Typhimurium* cells, respectively, 1.10, 100 and 1000, respectively) were taken and thermostated at $T = 37^{\circ} \text{C}$ for 2.4.6.8 and 18 hours. Next, the mixture of plant cells was stored at minus 20°C until the time of the study. So did the material taken after 2, 4, 6 and 8 hours from seeded samples. Interpretation of PCR results was based on the presence (or absence) of the intersection of the fluorescence curve with the threshold line established at the appropriate level, which determined the presence (or absence) of the value of the threshold cycle (Ct) for this sample of DNA equal to 38.

4 Discussion

As a result of the studies, validation of the test systems was carried out and modified and adapted screening techniques were developed to determine organophosphorus pesticides and pesticides from the imidazoles class in plant feeds and water based on the inhibition of acetylcholinesterase activity with colorimetric determination of the final result on a vertical photometer as well as immunomicrochip technology. Techniques are highly sensitive and relatively low cost. Also, the analysis time is 1-2 hours, including sample preparation, which makes them promising for the control of pesticides in plant foods and drinking water from open sources.

Analysis with the help of IIEC does not require sophisticated equipment, which allows it to be used in laboratories with low technical equipment. However, direct examination of the extract of food homogenates utilizing the immunochromatography method is possible only with an extremely high level of contamination of products or raw materials with Salmonella, which is a rare case. The duration of such an analysis scheme, including sample preparation, does not exceed 1h. Sample preparation involves homogenizing the product, extracting the cells with assay buffer, filtering or centrifugation under mild conditions, and then applying the filtrate or supernatant to the immunochromatographic test. To increase the sensitivity, pre-

enrichment (for bacteria) or concentration (for toxins) can be used.

The experimental estimation of multiplex PCR in real time mode and robotics for control of salmonella in meat raw materials and products was carried out. Enrichment of the isolated bacteria from the objects in the primary accumulation environment for 4 hours made it possible to identify *S. Typhimurium* by real-time PCR reliably

Robotics allowed in an automatic mode to carry out deproteinization, separation of fractions of lipid-protein debris and DNA. This approach allowed for 4 hours to display Salmonella in artificially contaminated sites. The results were correlated with bacteriological analysis data.

Conclusion

As a result of the studies, the possibility of determining organophosphorus pesticides and pesticides from the class of imidazoles in plant foods and water has been demonstrated, based on the inhibition of acetylcholine-esterase activity with a colorimetric determination of the final result on a vertical photometer as well as immunomicrochip technology.

Indicator immunochromatographic elements with colloidal gold nanoparticles (IIEC) are promising for screening control of natural toxicants: microorganisms, toxins of bacteria and fungi.

The high sensitivity of the real-time PCR technique and automation makes it promising for bacterial control in raw materials or products, especially for those that are difficult to grow or are dangerous (salmonella, campylobacteria, causative agents of anthrax, brucellosis, etc.)

The carried-out researchers have shown perspective of the considered innovative directions for introduction in practice of the control of the toxicological and microbiological safety of raw materials, food products and objects of food manufactures.

Source of Support: Research was carried out within of the state contract 15.7831.017 / BC "Search for living systems and substances of natural origin with the analysis of their biological activity for the creation of functional food and feed products".

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Primary Paper Section: A

Secondary Paper Section: AC, FQ

MEASUREMENT OF INTANGIBLES AND KNOWLEDGE: AN EMPIRICAL EVIDENCE

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Abstract: Knowledge has become the main source of value creation in many businesses. In the paper we investigate applied approaches for estimating the value of intangible assets published in recent years. The objective of our paper is to compare three main approaches, which were used as intangible intensity indicators in last five years. We apply them on a sample of data of European companies from database Amadeus. The analysis covers ROTA measure as well as investment in intangible assets and expenses into research and development as the key drivers of the knowledge creation in a company. We show that for European firms with increasing ROTA rank measure, the value of R&D expenses and disclosed intangible assets increase as well.

Keywords: intangible assets, intangible-intensive firms, R&D expenses, intangible fixed assets, ROTA rank measure.

1 Introduction

The success of most firms relies on intangible assets and investment in research and development (R&D) that creates this kind of assets within a company. Traditional view recognized only capital and labor as factors of production; however newer research underlines the role of knowledge, education, productivity and human capital in long term economic growth.

According to Guellec and Pottelsberghe (2004) a new paradigm has emerged that recognize that the productivity and growth are more dependent on knowledge. Even Organization for Economic Co-operation and Development (OECD) uses and accepted term knowledge-based economies, whereby OECD (2005) defines this type of economy as “trend in advanced economies towards greater dependence on knowledge, information and high skill levels, and the increasing need for ready access to all of these by the business and public sector”.

Malhotra (2000) expresses knowledge as the hidden assets of a country that underpin its growth. Rosenberg (2004) concludes that economic growth can be achieved either through increasing the inputs that enter to the productive process or through searching for new ways of doing things. Managing knowledge (regardless of the economic level) underpins the second part of Rosenberg's view as it should be directed towards making new connections between disparate ideas and knowledge (Boden, 2003) and our willingness to innovate is our only limitation for these combinations to happen.

Even Denison (1979) in his early investigation of resources of growth in the US concluded that the knowledge, skill and energy of labor were important determinants of economic growth.

A further step in the analysis of the effect of intangibles on economics growth we can find in Corrado, Hulten and Sichel (2006). They qualify any use of resources that reduces current consumption in order to increase it in the future as an investment. They require an equal treatment of all kinds of capital. According to them, investment in knowledge capital should be placed and recognized with same importance as investment in tangible assets. They also expanded definition of capital by including all investments in human capital, R&D expenditures, and also any expenditure in which a business devoted resources to projects which increase rather future than current output.

Knowledge is the main determinant of innovation that helps to strengthen economic growth and sustainable development, employment, and competitiveness in the European Union. Importance of knowledge or intangible assets increased also in private sector, mainly due to the development of information

technology. Globalisation, deregulation of key economic sectors, and exponential growth in the area of technology changes move new information and communication technologies forward and allow global access to information and knowledge. These trends stand for the birth of economy of intangible assets that is also known as the knowledge-based economy. Increasingly more businesses invest its sources into the management of intangible assets, which allow them to reach sustainable economic growth and became more competitive in comparison with other businesses. According to Peter Drucker (1969), “If you can't measure it, you can't manage it. This reason led academicians, researchers, and practitioners towards developing new quantitative and qualitative methods, which can determine or estimate the value of intangible assets.

Intangible assets include all identifiable assets without physical substance that dispose of monetary value – e.g. computer software, patents, copyrights, licenses, customers' and suppliers' relationships or marketing rights. OECD (2004) differentiates between intangible fixed assets that are non-financial produced fixed assets that mainly consist of mineral exploration, computer software, entertainment, literary or artistic originals intended to be used for more than one year, and intangible non-produced assets that are assets that entitle their owners to engage in certain specific activities or to produce certain specific goods or services and to exclude other institutional units from doing so except with the permission of the owner (e.g. patented entities or purchased goodwill). In original papers of OECD are intangible assets denoted also as knowledge assets or intellectual capital. The system of national accounts (SNA) recognizes several types of intangible assets (e.g. R&D, computer software and databases, mineral exploitation, artistic and literary works). Other types of intangible assets, such as organization capital, brand or copyrights might play an important role in the growth of GDP and productivity. Their exclusion from the group of SNA is related to the practical problems of their measurement (OECD, 2016).

Accounting for intangible assets is governed by the law of the country. International Financial Reporting Standards (IFRS) were developed as an effort to unify compilation and comparison of financial statements. Accounting according to IFRS is in Slovakia obligatory for consolidated financial statements of European enterprises and all institutions in public interest (banks, insurance companies, etc.). All the other institutions may apply IFRS voluntarily. Montresor, Perani, and Vezzani (2014) define intangible assets as non-financial, non-physical assets, which are created over time and through investment, and are identifiable as separate assets. This definition results in three conditions that each intangible asset must meet to be recognized in accounting. The first condition is identifiability. An asset is identifiable when it is separable and arises from contractual or other legal rights. The second condition is the control (power to obtain benefits from the asset) and the last one is the possibility to create future economic benefits (International Accounting Standards Board, 2016). IAS 38, that is part of IFRS, defines intangible assets as non-monetary assets which are without physical substance and identifiable (either being separable or arising from contractual or other legal rights). This, however, is a very narrow definition of intangible assets eliminating the majority of internally generated intangible assets, goodwill, etc.

One of the most problematic aspects of intangible assets is their intangibility and therefore difficult measurability. Measurement of intangible assets became a challenge for academicians and practitioners. During the decades it was proven that intangible assets contribute to the growth of firms and the whole economics, improve business performance and represent a significant competitive advantage. Firms systematically rebalance their financial sources with increasing proportion of intangible and decreasing proportion of tangible resources. The biggest boom of inventing and estimating new intangible asset measurement methods have been noted over the years 1988 –

2009 (Osinski, Selig, Matos and Roman, 2017). However, the problem of measurement remains unsolved. It is still not possible to capture the value of all intangible assets in the firm; we can only estimate their value and recognizing of an intangible asset in financial statements of the firm must undergo strict regulations. A comprehensive taxonomy of intangible asset measurement methods has been done by Sveiby (2010). He assigned more than 40 measurement methods into four categories: direct intellectual capital methods, methods based on ROA, market capitalization based methods and scorecard methods. More than half of methods belong to the scorecard methods that have mainly qualitative character. Because it is difficult to make a comparison between companies, their contribution is limited (Hunter, Webster and Wyatt, 2005).

2 Literature Review

The first step in measuring intangible assets is to define what we understand under intangible assets within our measurement method. Intangible assets in general cover all types of internally created and externally acquired assets of the firm that generate intangible driven earnings. Denicolai, Zucchella, and Strange (2014) state that intangible assets are able to create value only in combination with other tangible assets. In praxis, it is not possible to capture all dimensions of intangible assets, we can only estimate the value. Moreover, it is not easy to choose the best method from all that are available for estimating the value of intangible assets. Choosing the right method depends on two main factors – quality and availability of data and purpose of value estimation.

Corrado, Haltiwanger, and Sichel (2009) divided intangible assets into three broad categories: computerized information, innovative property, and economic competencies. A major component of computerized information is software. Innovative property groups all investments and activities that lead to discovery and development of new assets.

Usually, they are listed in profit and loss statement as expenses, not as intangible assets in a balance sheet. Many authors, therefore, use R&D expenses as a proxy for intangible intensity. Economic competencies cover knowledge that is embedded in firm's human and structural capital. A typical example might be market-based assets, such as brands, customer loyalty, strategic relationships or marketing knowledge (Barney, 1991; Doyle, 2000). Another market-based asset, customer equity represents value added to existing and potential customers generating profit for the firm (Sacui and Dumitru, 2014).

When it comes to recognition and disclosure of intangible assets in a balance sheet, strict rules must be applied. Accounting treatment that internationally regulates such assets is the IAS 38 directive. It respects several cost-, earnings- or market-based methods, according to which it is possible to calculate the value of an asset and disclose it in a balance sheet. Most of the assets disclosed are externally acquired asset recognized at their purchasing price and intellectual property, which includes all creations of the mind and WIPO (World Intellectual Property Organization) divides it into the industrial property (patents, trademarks, industrial designs and geographical indications) and copyrights.

This paper is based on qualitative research of published publications that apply some of the valuation methods for intangible assets. We have limited our research to analyzing financially and economically related journals with articles published over the years 2013 – 2017. We have analyzed publications of ScienceDirect database as it belongs to one of the most effective search engines for investigating research documents. We have limited our output by submitting keyword "intangible asset" and choosing only journals with economic or research focus. Our initial sample then consisted of 250 most relevant publications, from which ten was directly linked to our research.

Table 1. An overview of papers on valuation of intangible assets in 2013-2017

Author	Journal	Intangible asset measurement	Applied method and objective of the paper
Andonova, Ruiz-Pava (2016)	J. of Business Research	Possession of intangible assets - Brands, Patents, Franchise, Know-how, Licenses	Analysis of the relationship between ROA/ROS and intangible assets using hierarchical linear models for variance decomposition.
Sacer, Malis, Pavic (2016)	Procedia Economics and Finance	Non-current intangible assets according to IAS 38 (development expenditures and licenses)	Determination of the influence of different management estimates on the overall financial position and business performance (ROA, profit margin, total assets turnover). Financial statements analysis instruments are used to quantify the impact of accounting estimates on the financial position and business performance.
Contractor, Yang, Gaur (2016)	J. of World Business	Intangible assets from Orbis database	Using panel data model for verifying internalization theory about the positive relationship between parent intangibles and foreign affiliate performance.
Arrighetti, Landini, Lasagni (2014)	Research Policy	Intangible assets originally reported as assets on companies' balance sheets (intangible fixed assets, i.e. research and advert. expenditures, patents, licenses, and trademarks).	Probit analysis of factors that motivate firms to invest in intangible assets.
Clausen, Hirth (2016)	J. of Corporate Finance	ROTA Rank Measure based on Calculated Intangible Value (CIV)	Estimating the value of intangible assets and relationship between estimated intangible assets and firm performance.
Peters, Taylor (2017)	J. of Financial Economics	Knowledge (R&D spending) and organizational (% of selling, general and administrative spending) capital	Calculation of new Tobin's q proxy that accounts for intangible capital.
Borisova, Brown (2013)	J. of Banking & Finance	R&D investments	Using a variety of estimation approaches for testing the relationship between tangible asset sales and investments in intangible assets.
He, Wintoki (2016)	J. of Corporate Finance	R&D investments	Investigating the relationship between R&D investments and cash holdings of US firms.

Source: author's own elaboration

Table 1 shows that R&D expenses are used the most often as proxies for intangible assets. Clausen and Hirth (2016) suggested new, earnings-based method for calculating the value of

intangible assets that summarizes the value of existing and new intangible assets. Another group of published paper base their intangible assets' value on intangible assets recognized on

balance sheets. We, therefore, look in more detail on this three groups of estimation approaches, analyze them further and describe main advantages and disadvantages of using each approach.

3 Research Methodology

Our data sample consisted of 4799 European companies listed on a stock market from 37 European countries of database Amadeus for the years 2011 – 2015. Based on results from our qualitative literature review, we decided to compare three basic measures: intangible fixed assets from the balance sheet, R&D expenses from profit and loss account and indirect measure of intangible assets suggested and proved to express intangible intensity by Clausen and Hirth (2016).

Table 3. Mean values of selected indicators for each analyzed year

	2015	2014	2013	2012	2011
Mean ROTA rank measure	0.025	0.038	0.026	0.054	0.036
Observations	3537	3586	3563	3580	3569
Mean R&D expenses (EUR)	97163.148	88069.567	79237.487	85278.984	81817.287
Observations	932	946	952	949	949
Mean Intangible fixed assets (EUR)	509407.572	466326.091	438196.084	454227.287	440209.011
Observations	4651	4664	4660	4656	4586

Source: author's own elaboration

All necessary data were available in financial statements. ROTA rank measure was more difficult to obtain and we calculated it according to the procedure proposed by Clausen and Hirth (2016). Return on tangible assets (ROTA) was calculated as the ratio of EBITDA and tangible assets. Authors devote their model from Cobb-Douglas production function and prove that return on tangible assets affects the intensity of intangible assets and allows us to estimate their value indirectly. We started with the calculation of ROTA and we deducted industry and year median from each value to eliminate the effect of business cycle variations and other factors not related to the productivity of intangible assets. Finally, we normalized our data by standard deviation. As proposed by Clausen and Hirth (2016) and resulting also from the problem of interpretation of CIV by Stewart (1998), we assigned zero value to the items, where ROTA rank measures were negative. In these companies, we assume no value of intangible assets. Financial statements' items related to intangible assets are known for problematic accounting recognition and disclosure. For that reason, we had to clean our data for missing and extreme values.

We excluded firms with the negative or missing value of R&D expenses or intangible fixed assets. Table 2 provides mean values of our indicators and numbers of available observations.

After excluding unsuitable observations, we analysed 492 companies from six countries of Europe. Geographical structure of our data sample is listed in Table 3

Table 4. Mean values for 2015 deciles

Mean values sorted by ROTA rank measure										
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
In R&D expenses	7.932	8.336	9.149	9.905	9.840	9.765	9.973	9.894	9.799	8.610
In Intangible assets	8.035	9.420	11.083	12.178	11.607	12.344	12.006	12.162	11.433	10.527
In Total assets	10.252	11.523	13.654	14.544	13.902	13.957	13.691	13.644	12.875	11.934
Mean values sorted by R&D expenses										
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
ROTA	0.109	0.099	0.169	0.095	0.111	0.101	0.134	0.111	0.114	0.113
In Intangible assets	8.773	8.618	9.628	9.803	10.104	11.017	10.952	12.459	13.777	15.576
In Total assets	10.647	10.721	11.567	11.660	12.076	13.055	13.225	14.429	15.466	17.040
Mean values sorted by intangible fixed assets										
	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10
ROTA	0.067	0.141	0.097	0.108	0.140	0.126	0.117	0.137	0.112	0.11
In R&D expenses	7.445	7.724	7.827	7.91	9.101	9.013	9.657	10.205	11.230	13.014
In Total assets	9.782	10.553	11.132	11.606	12.478	12.837	13.616	14.613	15.791	17.473

Table 2. Geographical data structure

Country	ISO Code	Number of companies	
		Data sample	Cleaned data
Germany	DE	410	70
France	FR	551	131
United Kingdom	GB	941	176
Switzerland	CH	159	69
Luxembourg	LU	3	1
Sweden	SE	235	45

Source: author's own elaboration

Our final sample consisted of several most developed countries of Europe. In these countries, we expect a higher value of intangible assets in comparison to the other countries.

4 Results

We were interested, whether there is some similar development between direct and indirect measures of intangible assets. To fulfil our goal, we first performed correlation analysis. Whereas the correlation between intangible fixed assets and R&D expenses was relatively high for each year (0.73 for the year 2015), there was no correlation between ROTA rank measure and intangible fixed assets or R&D expenditures (for the year 2015 it was correlation 0.02 for R&D expenditures and 0.03 for intangible fixed assets).

To gain some more insight into the development of chosen indicators, we divided our observations for the year 2015 into ten deciles according to their value. Ten percent of observations with the lowest value of indicator belonged to decile D1, and ten percent of observations with the highest value belonged to decile D10. To show what these three indicators capture, we calculated a mean value for each decile of the ROTA rank measure, natural logarithm of R&D expenses, and natural logarithm intangible fixed assets, respectively.

Note: D1, ..., D10 represent deciles from the lowest 10 percent to the highest 10 percent of observations sorted by ROTA rank measure, R&D expenses normalized by standard deviation, and intangible fixed assets normalized by standard deviation, respectively. Color scales represent conditional formatting from the lowest (red) to the highest value (green) in a selected category.

Source: own editing

From Table 4 we can observe that R&D expenses and disclosed intangible assets tend to increase with increasing ROTA rank measure. From Table 4, we can clearly see increasing values of intangible fixed assets with increasing R&D expenses and increasing values of R&D expenses with increasing intangible fixed assets. The variable total assets is used to express the size of the firm and tends to be lower for companies with the lower intensity of intangible assets measured by all three indicators and higher for higher intangible intensity. This result indicates that bigger firms are more intangible intensive and it is clear for R&D expenses and intangible fixed assets and less clear for ROTA rank measure.

From the comparison of ROTA rank measure and other two indicators, we can confirm that ROTA rank measure estimates the value of intangible assets of European companies and might be used as useful intangible intensity indicator. This is observable for first eight deciles. Last two deciles move in opposite directive.

5 Discussion and Conclusion

Our paper provides empirical evidence on three basic intangible assets measurement approaches published in economic journals in the period of last five years. European data sample is less intangible intensive measured by all three indicators. This was confirmed also by INNODRIVE and COINVEST project funded by European Commission and concluded by Corrado, Haskel, Jona-Lasinio, and Iommi (2016). They state that in Europe in comparison with the US, the share of intangible assets is lower and the share of tangible assets is higher. Moreover, whereas the share of intangible assets in the US exceeds tangible assets, we can observe an opposite trend in Europe.

We compared our results for the last analyzed year by dividing it into ten deciles according to each measurement approach. We already know that R&D expenses and intangible fixed assets represent only small part of the intangible intensity of the firm. R&D expenses are related to newly generated intangible assets and do not involve intangible assets created in the past. On the other hand, not all investments allocated to R&D must be successfully translated into intangible assets. In such cases, we can talk about them as about sunk costs. Intangible fixed assets are usually externally acquired or we can clearly determine their monetary value when they are internally generated. That means that they do not include most of the internally generated assets, which are difficult to evaluate. We were therefore interested, whether the third indicator – ROTA rank measure is more suitable for estimating the value of all intangible assets of the firm. We assumed that increasing value of ROTA rank measure will be accompanied by increasing R&D expenses and increasing intangible fixed assets as proved by Clausen and Hirth (2016) on the sample of US firms. This assumption was confirmed for first eight deciles. In last two deciles, the value of R&D expenses and intangible fixed assets decreased again. The analysis of Clausen and Hirth (2016) has been performed on the sample of US companies that are more homogenous and their accounting regulations are similar. European countries are a more diverse entity. Our sample consisted of intangible intensive France, UK and Sweden and less intangible intensive Germany (Corrado, Haskel, Jona-Lasinio, and Iommi, 2016). This might be the reason for the not monotonical development of R&D expenses and intangible fixed assets with ROTA rank measure.

We see that all approaches have their limitations in case of measuring intangible intensity. ROTA rank measure represents just estimation of intangible assets based on rentability of tangible assets, R&D expenses are investments made for creating new intangible assets and do not include already existing intangibles and intangible fixed assets cover just small part of all

intangible assets that might be present in a firm. However, we have no other possibility to get more historical data.

Acknowledgements

This research was supported by VEGA project No. 1/0311/17 on Measuring and Reporting Intangible Assets.

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Primary Paper Section: A

Secondary Paper Section: AE, AH

MODERN PROBLEMS OF ESTIMATION OF EFFECTIVENESS OF THE STATE EMPLOYEES' LABOR

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Abstract. The article deals with the main problems of the labor market in the sphere of public service as a specific segment. Namely high turnover and a lack of highly skilled staff; lack of the majority of employees of professional, practical skills, corresponding to the qualification requirements for their performance; a decrease in the moral qualities of employees. The purpose of the work was the development of methods for assessing the effectiveness of professional work of civil servants. Elements for determining the professionalism of a public servant are presented. The criteria of an estimation of indicators of productivity of activity of civil servants are defined in work. The informational basis of the research was the works of domestic and foreign scientists. The materials of scientific and periodical press on the problem are being investigated, the official Internet sites of state institutions, the documents of conferences and seminars, the normative legal acts of the Russian Federation and the subjects of the Federation and the results of their own research.

Keywords: civil servants; staff; labor efficiency; professionalism.

1 Introduction

Today, the problem of finding tools to increase the efficiency of public servants' work, the solution of questions of assessing and improving the payment of their labor is topical. The experience of different countries in the area of reforming the civil service system has shown that this system extends far beyond the measures to increase payments, more clearly distinguish wages according to the level of qualifications and experience, and the volume of benefits granted. An important role should give to improve the feedback, which is characterized by the control of society for the quality and efficiency of the public service.

Consider the problems of the labor market in the public service as a specific segment: high turnover and a lack of highly skilled workers; lack of the majority of employees of practical skills, corresponding to the qualification requirements for their

performance; a decrease in the moral qualities of employees. The main reason for the problems listed above is the low level of effectiveness of instruments of financial incentives for civil servants.

2 Results

2.1 Elements for assessing the professionalism of a civil servant

Improving the quality and efficiency of public servants' work has become the basis for carrying out state reforms. The creation of a system of indicators of the effectiveness of civil servants, their involvement in achieving significant goals for society is vital elements in making the success of reform.

According to the law, the assessment of professional skills and knowledge is one of the requirements for posts in the public service. Subjects of the RF are obliged to develop criteria independently for assessing the professional skills of their employees (About the system of public service of the Russian Federation: fed. Law No. 58-FZ: (adopted by the State. The Duma on May 27, 2003: approved. Council of Federation on May 14, 2003) URL: http://www.consultant.ru/document/cons_doc_LAW_42413/ (date of circulation: 15.03.2018)).

In the subjects of the Russian Federation, they did not begin to solve this problem due to the lack of modern personal technology. There are no specific legislatively fixed rules for the formation of criteria for assessing the professional and personal qualities of an employee. Therefore, each manager has the right to determine these criteria by himself. Some authors, in particular, M.V. Melkumova, A.A. Derkach, professional skills and personal qualities are considered as synonymous (Akmological 2006; Assessment of the effectiveness of public servants / Melkumova M.V 2015). And only some authors distinguish these qualities (Increase of efficiency of work of municipal employees // the Bulletin of academy of the right and management. - 2016.).

The decomposition and formation of the two groups of indicators necessary for the assessment seem logical in that the evaluation of the professionalism of civil servants is focused on determining the level of competence of the employee. Professional expertise includes knowledge acquired in the process of training and practice, skills and skills. Evaluation of individual characteristics is a component of the procedure for assessing personal qualities. The combination of these elements leads to a clear assessment of unusual conditions. By Figure 1, the evaluation of the professionalism of a civil servant must consist of three components.

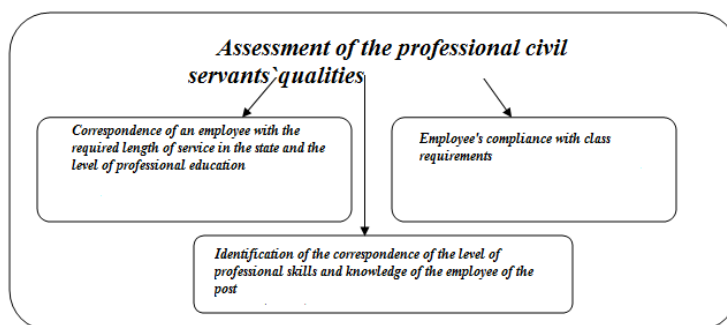


Figure 1: Assessment of professional qualifications of a civil servant

As part of the evaluation of the employee's professional qualities, the level of possession of modern methods, tools and for working with information resources is determined. Successful use of the official-business style of the contemporary

Russian literary language. Knowledge of techniques and forms of work is using automated management tools. Knowledge of the legislation regulating official activity; knowledge of powers and structural elements of public authorities; mastery of the rules of

business ethics; understanding of the fundamentals of the organization of the passage of public service, the official order of this public authority (Theoretical aspects of the analysis of the effectiveness of public administration // Nauki i mir. - 2014).

Thus, in the system of assessing the professional qualities of an employee, it is necessary to include four elements: the level of education and work experience required for working in a position and assigning a class rank; fitness level; professional knowledge and skills. Poor quality assessment of the staff can help reduce the quality of performance in work and failure to fulfill specific tasks as a result of incorrect evaluation of the potential of the employee. And as a result, lead to a decrease in the effectiveness and effectiveness of both his work and the functioning of the state body as a whole.

The creation of a comprehensive and objective system, reflecting the level of performance of professional duties within the framework of a post and the degree of implementation of the set goals of indicators that allow to focus the attention of civil servants on the main priority directions of the development of public authorities becomes the primary tool that contributes to improving the performance of civil servants in most countries. For these purposes, various performance indicators are widely used.

2.2 Criteria for assessing performance indicators of civil servants

In a broad sense, performance indicators are a quantitative or descriptive indicator that gives a clear picture of the result of the activity or the degree of success in achieving the goal. Performance indicators can be used to assess the performance of individual civil servants and the functioning of the public authority as a whole. In many Western countries, the main direction of improving performance indicators in recent years has been connected with determining the optimal ratio and establishing a direct relationship between individual indicators of public authorities and the performance indicators of civil servants separately.

The use of integrated performance indicators by public authorities is currently the most frequent. These indicators characterize the main political or economic aspects of the functioning of state bodies. Performance indicators for civil servants must meet the following essential criteria (Increase of

efficiency of work of municipal employees // the Bulletin of academy of the right and management. - 2016):

1. A clear relationship with the goals and objectives of public authorities.
2. Reflection of the degree of contribution to the process of achieving the goals and objectives of each employee.
3. The formulation of indicators should describe as much as possible the direct impact of a civil servant on the dynamics of performance indicators.

Indicators of labor efficiency of civil servants are a set of symbols that can be expressed in quantitative and qualitative form. As a rule, in the formation of quality indicators (for example, ensuring a high level of financial management efficiency) and authorities issue algorithms that clearly define the quality criteria for activities (for example, at the end of the reporting period. The number of additional expenses should not exceed a certain level of financial resources established by the department) (Features of Human Resource Management in the Public Service System // 2016).

One of the critical issues is the separation of the direct results of the work of civil servants from the final. The immediate consequences of the employees' work are expressed in quantitative characteristics of the volume of the tasks performed, and the final ones are represented in the realization of the goals and functions of state bodies that are significant for society. The achievement of the final results reflects the socially useful productivity of the employee, and the immediate results characterize the degree of rational and practical implementation by the civil servant of its activities from the state organ (Necessity of an estimation of efficiency and productivity of work of the state civil employees // 2015).

The process of assessing the rational use of resources in the process of achieving the planned results involves the definition of indicators that reflect the costs of carrying out activities, as well as characteristics of personal and professional qualities. In a separate group, the signs that characterize the process of fulfilling duties within the post by a civil servant are highlighted. Often such indicators determine the standards or the timing of the implementation of specific actions. Table 1 presents the classification and types of performance indicators of civil servants.

Table 1 Types of indicators result

Performance Indicator Type	Description	Examples
Indicators incoming resources	Characterize the costs of the implementation of certain activities and (or) a set of requirements for personal and professional skills of an employee	1. The amount of funds allocated for the implementation of the program. 2. The presence of certificates that assess the knowledge of a foreign language. 3. Travel expenses.
Processes Indicators	Characterize the standards and the timing of certain activities	1. The average duration of the approval of one draft regulatory legal instrument / document. 2. Number of days of deviation from the schedule of inspections. 3. Average waiting time in the consumer's queue.
Indicators of immediate results	Characterize the amount of work done (services rendered)	1. The percentage of complaints examined. 2. The number of active projects at the current date. 3. Proportion of draft documents executed in violation of established requirements.
Indicators of final effects	They characterize the degree of achievement of the goals and objectives of the authorities and (or) change in the state of the target group of consumers of services	1. The number of fatalities in road accidents on the roads that were inspected no more than a year ago. 2. Reduction of the number of committed crimes by 10 thousand inhabitants. 3. Proportion of past social rehabilitation programs for people with disabilities.
Impact indicators	Characterize the effect of the influence of a civil servant on a managed subsystem or a specific target group	1. The amount of money saved during the implementation of the proposal. 2. The number of people satisfied with the quality and timeliness of the provision of services. 3. The percentage of amendments adopted to the bill.

The groups of indicators considered have different significance in the process of evaluating the effectiveness of the work of civil servants. For example, the achievement of indicators of immediate results to public servants is more comfortable than achieving high end-effect indicators that are more significant.

Currently, the reform of the civil service is aimed at modernizing the functioning of government bodies in the Russian Federation, proposing the introduction of performance index systems in practice, improving the public service to the level of a modern and holistic system of professional performance.

It is necessary to widely use, in accordance with the key direction of reform, labor productivity indicators, which allow to fix in the form of clear target values of quantitative and qualitative parameters the features and the degree of achievement of the goals and tasks assigned to state bodies, their structural divisions and civil servants. The purpose of the application of these mechanisms is to improve the quality of the performance of official civil servants' duties and to determine the dependence of the labor incentive system on the results of the evaluation of their activities.

For individual civil servants, the formation of a system of performance indicators is possible shortly. The legislation noted a clear trend of evaluation based on performance indicators of civil servants. In connection with the application of the contract system for civil servants, performance indicators established in the job regulations are set. For individual civil servants, it is possible to use special wage schemes depending on the efficiency and effectiveness indicators (Indicators of the effectiveness of civil servants / 2015; Necessity of an estimation of efficiency and productivity of work of the state civil employees // 2015).

The effectiveness of the activity of the public authority is characterized by generalized indicators of the effectiveness of the public administration, formed in budget reports by subjects of budget planning, and guides in the process of creating performance indicators for individual civil servants. Each performance indicator should be contrasted with a specific goal or task of the subject of budget planning, and the target value of the indicators of efficiency and effectiveness is fixed.

Indicators of efficiency and effectiveness of the functioning of public authorities should be decomposed to performance indicators of civil servants' professional activity, by changing the wording of performance indicators, taking into account the maximum degree of influence of the civil servant on this indicator. Consequently, general and specific indicators of efficiency and effectiveness of professional performance are established for civil servants. The generalized indicators of efficiency and effectiveness are characterized by typical, common indicators for many civil servants (the timing of the formation of regulatory documents, the receipt and issuance of reports and other indicators). Thus, according to the terminology of legislation, it is possible to note the following groups of indicators of efficiency and effectiveness of professional activity of civil servants (On the state civil service of the Russian Federation: fed. Law No. 79-FZ: (adopted by the State. The Duma on July 7, 2004: approved. Council of Federation on July 15, 2004). URL: http://www.consultant.ru/document/cons_doc_LAW_48601/ (date of circulation: 15.03.2018).):

1. Indicators of the final effect, which characterize the efficiency and effectiveness of the functioning of the state body. Fixed in a specially designed application to the service contract.
2. Indicators of a direct result, which reflect the quality of accepted and executed managerial and other decisions. Fixed in a unique developed application to the service contract.
3. Indicators of processes that characterize the organizational, legal and documentation support for the implementation of these decisions. These indicators are reflected in the official

regulations, and describe the performance of professional duties and job descriptions for employees.

Part of the performance indicators, especially indicators of processes, professional performance should be established for all civil servants with official regulations, which are a mandatory application to the service contract. Thus, there is a need to develop a balanced system of performance indicators for civil servants, as well as to strengthen incentives for the proper execution of their official regulations.

2.3 Methods for assessing the effectiveness of professional work of staff

A comprehensive legislative framework for assessing the effectiveness of public servants is absent; current standards are quite vague, the methodology for evaluating civil service personnel is not sufficiently developed. It is necessary to consider methods of practical evaluation of the effectiveness of professional activities of staff that can be used in commercial structures and the public sector. The most frequent application of the following methods for assessing the efficacy of professional work of personnel is noted:

1. The process of competencies, the use of which involves comparing the evaluation of a specialist with the "ideal" profile of his position. This method makes it possible to conduct an effective assessment of personnel, to identify the direction of its development by the needs of the organization and the employee. The application of this method allows (Akmological assessment of professional competence of civil servants. 2006):

- managers and HR-department to evaluate candidates on the same criteria;
- determine the criteria that characterize the success of the work;
- build effective teamwork;
- employees identify their weaknesses and strengths;
- identify the basic needs for training and development of employees;
- to form an understanding of the category of "effective employee."

Within each position of the organization, a unique set of necessary qualities is determined. Frequent use of the following competencies is noted: the skills of effective communication, the ability to work in teams, the orientation of effort to results, the ability to lead, the ability to organize and control work, a high level of adaptability to change, and the skills to effectively solve problems.

The set of individual competencies of the employee is formed from managerial, corporate and professional characteristics. The management of the organization by the performance appraisal is given a slightly robust mechanism for managing the efficiency of employees' work, a clear understanding of the direction of change of each of the evaluated employees is formed to increase the efficiency of its activities.

2. Management by objectives. The method by which management and evaluation are carried out by setting goals for the professional business, formed and agreed by the manager and subordinates together for a specific period.

3. The method of the assessment center is based on the modeling of critical aspects of the activity for assessing the professionally essential qualities of the employee.

4. Attestation - assessment of the level of professional knowledge, qualifications, practical skills, business and personal qualities through testing, interviewing, written description of the characteristics of the employee, description of the behavior of the employee in critical situations.

5. Psychodiagnostic methods are used to study the personality of the worker, the level of social development. Psychodiagnostic techniques can act as the sole instrument for attestation. Their

use is relevant when assessing managers in the situation of problems or the possibility of claiming a higher position. Evaluation can be conducted in the form of testing or interview.

An in-depth psychological interview is a structured interview with an analysis of biography data, a discussion of life situations. From the professionalism of a specialist with a high level of psychological insight, the accuracy of the information obtained depends. The use of interviews is relevant in cases of promotion, appointment, dismissal, drawing up a plan of activities to improve the level of personal effectiveness of managers.

A test is a set of questions or tasks that are performed by an assessed over a specified period. Tests are divided into professional and psychodiagnostic.

Psychodiagnostic tests are used to assess abilities, attention, intelligence, memory (Lusher tests, Eysenck tests, SHL tests and other tests) and are used to determine personality type and behavioral characteristics, including interpersonal relationships (Myers-Briggs, MMPI, Kettel, test Zhuravlev for assessing leadership style and others). Tests for evaluating skills and knowledge are professional, often drawn up by specialists with a narrow profile in the form of a set of practical questions and tasks. Particular attention should be paid to explaining the results obtained during testing. To carry out such an assessment can be specialists having appropriate certification. Otherwise, the results are subject to challenge in court. The absence of a particular certificate of a specialist company does not represent a legal opportunity to conduct testing on specific techniques (Akmological assessment of professional competence of civil servants. 2006, c. 245-264).

One of the personal technologies contributing to the improvement of the activity of the authority in selecting, determining the level of their professional training and increasing the effectiveness of their activities, raising the level of skills and placement of civil servants is the attestation of a civil servant.

The appraisal is a test of the professional competence and qualification of a civil servant, aimed at determining the compliance of a replaced position of a civil servant. In the process of attestation, the knowledge and skills of a civil servant, work experience, professional competence, quality and efficiency of performance are assessed (Certification: a formal procedure provided for by law, or objective necessity, 2015).

Along with the definition of compliance with the positions held by civil servants. Other tasks are being solved: determining the degree of need for further training, training or retraining of a civil servant. Formation of the perspective of using the identified abilities, stimulating the growth of the employee's professional competencies; ensuring the possibility of planning in the long term the movement of personnel, as well as the release of an employee from his post or transfer to less skilled work.

Various forms and methods of certification are used, and sometimes a combination thereof is possible. At present, a large number of methodological materials have been developed in the part of organizing and conducting an assessment of the quality of work of various categories of specialists.

Traditionally, attestation is conducted in the form of an interview. Certification allows within the limits of a post to define development resources and to estimate a level of professional knowledge of the worker; the degree of achievement of the goals set for the employee; compliance with requirements for the position held.

Depending on the procedure accepted in the organization, the duration of the interview is usually from thirty minutes to one hour. To conduct a certification interview, the following actions are performed: the immediate supervisor prepares a review for the attest; the employee makes a report on his activities, the supervisor studies the employee's feedback and report and

assesses the results of his work, indicates with what he agrees on what to look for.

Certification material is distributed to the committee members in advance to formulate a list of questions to be asked by the assessor. In addition to the analysis of the report and the recall, during the interview, the employee orally tells about his work activity. In the process of discussing the professional development of the employee, there is a prioritization, discussion of the appropriateness and opportunities for further training.

Certification can be conducted in the form of a certification examination, during which, according to the tickets, the attested one answers the questions posed. The certified person may be additionally asked questions about the knowledge and fulfillment of the requirements of the job description. The exam is usually applied in combination with the interview. It should be noted that the certification exam is the most frequently used and economical method for assessing an attested. However, this method of knowledge and professional competence of the attested person cannot always give correct representations (Theoretical aspects of the analysis of the effectiveness of public administration // 2014 , Certification: a formal procedure provided for by law, or objective necessity, 2015).

At present, test tests are most commonly used, most often during the qualification examination, but can also be used in attestation. Testing as a way of testing the professional skills and knowledge of the employee in some cases is very useful. The application of the above-described method provides an objective and similar approach to the evaluation of each employee of a separate professional group. Formation of criteria for evaluating the performance of attendees differentially, by the group of posts and taking into account their specialization is one of the most challenging tasks.

Evaluation of the degree of expression of professionally critical personal qualities that contribute to the successful performance of official duties is a problematic issue. In this part of the certification process, the level of subjectivism is unusually large. The more interesting is, the more productive approaches to their definition, taking into account the specialization of the positions held.

3 Discussion

In the practice of personnel management in the public service sphere, there is experience in applying methods of assessing professionally significant personal qualities in the course of attestation (expert, scoring, ranking). Evaluation is the most important tool for the professionalization of personnel in any of its organizationally fixed forms. Specification of the criteria, taking into account the degree of complexity and specificity of the subject of work of civil servants, careful selection of experts and their preparation, the choice of methods that allow to take into account and adequately reflect the features of the evaluation object should become the main directions for its improvement.

Participation in the certification commissions of independent experts is an essential condition for attestation. An independent expert is a representative of the scientific, educational community, other organization; is invited by the representative of the employer of the relevant public administration authority (On the state civil service of the Russian Federation: fed. Law No. 79-FZ: (adopted by the State. The Duma on July 7, 2004: approved. Council of Federation on July 15, 2004). URL: http://www.consultant.ru/document/cons_doc_LAW_48601/ (date of circulation: 15.03.2018)).

Its presence should provide an uninterested, independent view of attestation and evaluated employees. Evaluation of the expert is subject to the work of the commission, the identity of the employee, the provision of documents. The presence of an expert is necessary to create a favorable psychological atmosphere, free from absolute administrative pressure, the situation of cooperation of all participants in certification. When resolving disputes, the expert may act as an arbitrator.

Currently, at the federal level, there are no public service management bodies, which must fulfill some powers established by law. For this reason, individual organizations invite their colleagues from other government bodies. This practice does not fully meet the requirements of the legislation on public service. The formalism of attestation is manifested in the following:

1. Members of the Attestation Commission do not analyze the official regulations of civil servants subject to certification, which reflect not only the job descriptions but also the criteria for the effectiveness of the employee's work.
2. Criteria for the effectiveness of the employee's work are far from perfect: they change quite often, and sometimes employees about them have no idea.
3. It is not enough to apply the results of the certification.
4. The system of employee rewarding based on the results of attestation is not specified in any normative document.

The effectiveness of the certification procedure can be improved by (Certification: a formal procedure provided for by law, or objective necessity, 2015):

1. Precise regulation of the public service post by the official regulations, which provides a list of indicators, which can be used to assess the performance of a civil servant, the possibility of his level of competence and job growth.
2. Timeliness of adoption of legally sound decisions based on the results of attestation by the head of the state body.
3. Knowledge of civil servants for promotion tools for decent behavior; analysis of the cause of the discrepancy between the established and achieved indicators; possession of information on the prospects for control and stimulation.
4. The development of an indicative list of indicators for assessing the qualification of an employee, the procedure for carrying out the evaluation procedure itself, can help the unit manager in preparing a response to an arrestee.

Evaluation of the effectiveness of civil servants should be carried out complexly, and as an object of evaluation, an individual worker or a team of the functional unit should be identified. The application of labor assessment methods plays a crucial role in ensuring the openness of the civil service, in the process of selecting a new leader, in creating a reserve of cadres for promotion, with the ongoing reshuffle of personnel.

Conclusion

In modern conditions, the problem of the effectiveness of professional activity of civil servants acquires particular significance. The process of creating a unified system of public service is underway in the country, where a particular place is assigned to the creation of a cadre with a high level of qualification that ensures the effectiveness of public administration. Therefore, the scientific approach to the problem of the professionalism of the civil servant acquires particular significance, which allows us to understand the processes taking place in professional managerial activity and efficiently influence the results.

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Primary Paper Section: A

Secondary Paper Section: AE

HOMELESSNESS AND SURVIVAL STRATEGIES OF THE HOMELESS

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Abstract: Homelessness is a multifaceted social phenomenon affecting to a significant degree the nature of individuals in multiple dimensions. The consequences of losing a home are usually accompanied by a change in attitudes and how individuals behave toward both themselves and the majority society. The absence of housing shapes the homeless in terms of their awareness and self-fulfillment, as they search for a place to live and apply strategies for survival on the street. This study aims to analyze the results of concrete research and the survival strategies homeless people routinely use in conjunction with the effort to secure their essential needs.

Keywords: Homeless people, Survival strategies, Labor force participation, Social services, Public space.

1 Introduction

The society is an area in which different social phenomena occur, including factors of their origin and scope (Kubičková, 2015). Homelessness can be characterized in its own complex form as a socially undesirable phenomenon whose causes, course and consequences are closely linked to other social phenomena, transitioning into a subsequent multifaceted nature that affects the overall condition in many respects (and dimensions) of their lives (Brown, Thomas, Hinderlie, 2013).

Barták (2004) argues here that homelessness is essentially a concept often associated with poverty. The homeless can be described as people with neither permanent housing nor employment, which causes exclusion for many of them from access to resources, opportunities and possibilities generally available to everyone living in the community.

In this respect, the concepts of poverty and social exclusion are connected, resulting in a condition where being homeless is likewise accompanied by a feeling of loneliness and social isolation across multiple dimensions and, in connection therewith, homelessness is similar to the concept of extreme social exclusion (Anderson, Filipovič Hrast, Finnerty, 2016).

When the condition persists for a longer period of time and the unfavorable situation cannot be resolved, the homeless become in many cases apathetic and indifferent, with an absence of any vision of how to lead their lives and even absolute hopelessness (Bočáková, 2014).

In relation to this state, Dykeman (2011) considers homelessness to be the absolute descent in an individual's social status, where a homeless person realizes their current precarious existence, not seeing (or even admitting) any possible change for the better.

The very issue of homelessness has for a long time failed to receive sufficient attention in developed and rich countries, with the result that people with no housing remain not only on the margins of society's concerns, but also societal thinking has in many cases been accompanied by prejudice against those who have lost their homes and are residing in public spaces. It can be further said in this context that an overwhelming percentage of the housed majority are unaware of the homeless¹ having likewise the same right to survive and live a dignified and meaningful life (Habánik, 2017).

Keller (2013) agrees and further notes that, even though the right to survive and live a dignified life can be characterized as a certain standard of living in society, a significant part of society is still unable to guarantee this standard. In this context, the question also arises as to what extent the scope of the social state

dimension is realized, also in view of the presence of different social phenomena in society (Horváth, 2013).

Thus, homeless people have developed their own particular subculture within the existing societal model. Members of this subculture occupy the lowest social status level, displaying different behavior patterns and expressing exchanges in social interactions both inside and outside the subculture in conjunction with a specific value orientation among members of the subculture (Matoušek, 2008).

In terms of the subculture in which homeless people live, Tvrdoň and Kasanová (2004) highlight an applied street culture model, characteristically based on its own and specific expressions (including customary rules). Prominent here is an emphasis on the issue of daily survival and the need to mitigate the consequences life without a home entails. In this process, both apathy and indifference to anything happening outside of the subculture is likewise present.

Glasser and Birdgman (1999) emphasize also selection and subsequent grouping of homeless into two subgroups. One subgroup is composed of people actively seeking available assistance from existing possibilities (primarily based on the availability of social services) and the other comprises people who refuse any assistance and are relying solely upon themselves for survival.

In this context, there can be a debate about specific forms, in other words survival strategies employed by homeless people for them to ensure they have what is essentially needed to live. Therefore, a regular and daily system associated with feeding themselves and acquiring resources for daily survival, with these individuals focusing mainly on surviving from day to day with no long-term prospects.

Vágnerová, Csémy and Marek (2013) mention different findings from research conducted abroad exploring strategies for surviving on the street the homeless use to meet their immediate needs. These research findings indicate that such needs are met through small jobs, illegal work, stealing, crime, begging and even prostitution, means to which primarily younger homeless people suffering from drug addiction turn (Cloke, Milbourne, Widdowfield, 2002).

Substance abuse may also be a strategy for survival on the street, along with escaping from reality. Thus, acquisition and maintenance of resources are usually accompanied by alternative forms, too. Although some members of the public still believe the homeless to have alone put themselves in their plight due to distorted perspectives of them as asocial (without ever searching out different characteristics among them, in conjunction with their attitude, conduct and behavior toward themselves and the community), it should be noted here that many people are working and also searching for jobs and seeking to earn an income, despite their difficult life situation.

However, finding long-term employment is extremely difficult because of a lack of permanent housing (including a room designated for privacy, peace and relaxation), where the exclusion of such people from the labor market can be subsequently attributed significantly to the absence of such a place.

Another major problem is abuse of this target group from employers by offering only low-paid positions and providing no existing written contract. This unfavorable situation in which the homeless find themselves often forces them to work with no valid employment contract and without any previously agreed remuneration for work done (Marek, Strnad, Hotovcová, 2012).

¹ In view of the inability to apply a general definition of homelessness, Busch-Geertsema (2010) attempts to define it by utilizing and applying the ETHOS typology¹, such as FEANTSA (European Federation of National Organizations Working with the Homeless) presents it over a long-term horizon.

2 Objective and methodology

This study incorporates findings from our dissertation examining the tools and strategies used by the homeless to survive. With this in mind, we chose a qualitative type of research carried out over a longer period of time stretching from September 2016 to January 2017 in the Trenčín Self-governing Region, in addition to contact work with a target group of homeless people. The research group consisted of 15 deliberately-chosen respondents, nine men and six women, ranging in age from 17 to 62 years. As they were chosen deliberately, we also sought to assign the respondents into two groups, one utilizing a range of social services and the other rejecting any effort to seek out available social services.

Research was carried out with observations and semi-structured interviews either at individual social services facilities (a total of eight respondents of which six were men and two were women) or in their natural environment (a total of seven respondents consisting of three men and four women). In order for the data to be objective, all the respondents were familiarized with the aim and mission behind the research, and all of the respondents gave their consent to be part of it.

Our research enabled us to select six separate categories for us to explore, with the focus on identifying strategies for surviving on the street. Based on their circumstances, we examined and analyzed how they had become homeless, subjectively assessing their current situation from the perspective of the respondents themselves, the most ambitious changes they had made in their lives, the shelters they routinely preferred and how they earned money (to satisfy essential needs) as well as the respondents' attitude toward exploiting the range of social services available and existing in Trenčín Region.

3 Results and Interpretations

The first category involved an exploration of what led these people to become homeless. Family and partner problems are among the major factors driving homelessness, something several of the respondents confirmed in their statements.

Respondent 1 mentioned a brother living in the street because both their parents had died within a year along with their grandmother with whom they had lived, while Respondent 2 said, *"I hadn't gotten along well with my father...and I ended up homeless because I had a business and lost all my money. My father had access to the account and he emptied it."* Respondent 3 told about living in an apartment with her ex-husband, who was a junkie. *"He was smoking meth, and he kicked and beat me while I was pregnant"*, while Respondent 8 mentioned about breaking up with her partner after they had a fight and leaving the place where they had lived. It could be argued that the other respondents had also experienced dysfunctional family relationships, with Respondent 15 running away from home at 16 because he could no longer manage it, Respondent 12 working for several years until he was jailed and then on the streets as soon as he was released, or Respondent 14's husband no longer wanting her to live together with him and their two children after their divorce, *"...and so I had to go away."*

On the other hand, Respondent 6 never felt herself homeless after leaving the place where she had lived following the breakdown of her relationship, saying: *"I was not living in the street, but staying with an acquaintance."* Respondent 4 confirmed the theoretical concepts presenting the difficulties of reintegrating into society, explaining that after he was released from a sentence he was serving in prison, he had no idea where to go. Respondent 5 described alcohol and other addictions: *"I'm gambling and my partner is, too... and there's a judgment being enforced against him, too."*, while Respondent 10 talked about being treated by a psychiatrist for drug dependence. Respondent 11 mentioned growing up in an orphanage until he became an adult. Upon attaining majority age, he returned to his biological mother's apartment, but adverse family relationships took their toll when his mother threw him out on the street after a fight

where he had destroyed furniture. Economic problems could be another cause of homelessness, as was recalled by Respondent 9: *"...we had a nice apartment, but then the debts piled up and we didn't know how to repay them all."* and by Respondent 13, who lost the apartment he shared with his parents due to fraud, forcing them to live on the street. *"We've struggled through several institutions and cities."*

The next category involved a discussion of the respondents' attitude toward their current plight.

In this respect, two meaningful values could be noted that stood in contrast to each other. Half of the replies indicated an attitude of not having resigned themselves to their fate, such as Respondent 1, who said: *"I am not homeless as having no home...I'm trying to make a difference and stand on my own two feet."* Respondent 2 said the same thing in other words: *"I'm going my own way. Whoever wants to work will find a job."* and Respondent 3 saw herself as strong, pointing out, *"I've survived everything, even living on the street pregnant."* Other views included the concise opinion provided by Respondent 6, who mentioned other people living worse off, and Respondent 10, who said that he was wanted to put the pieces back together and afterward start living a normal life. Attention should be paid here to the assertion by Respondent 14 assertion of having everything she needs and Respondent 15's belief in overcoming her current condition: *"I'm turning over a new leaf where I don't have to obey and accept anyone."*

On the other hand, negative perceptions were presented by Respondent 4, who commented on his current predicament by saying, *"It depresses me...if I didn't believe in myself so strongly, I wouldn't know what to do."* Other respondents took a similar attitude, such as Respondent 5, who talked about her situation being nothing to boast about or envy, or Respondent 7 saying it made no difference to him, or Respondent 9 who expressed herself in the sense of *"I'm unhappy and it's all getting on my nerves."* Other respondents likewise felt indifferent or apathetic, with Respondent 11 commenting: *"I feel alone, abandoned, I have no one close next to me... so I don't care if I screw up."*, Respondent 8 admitting: *"I suffered a miscarriage...found myself a new partner...both of us are doing drugs."*, and Respondent 12's wry, ironic expression of his own predicament: *"Sweet, isn't it!"*

Next we concentrated on examining the respondents' subjective visions and what they would most want to change in their lives. The most pronounced desire encountered as a key factor for leading a dignified life was to acquire their own place to live.

Statements fell determinably in line with the opinions expressed by Respondent 1, who said, *"work's important...if some housing could be found that would allow it."* and Respondent 4's comment of *"I would like to live normally and have my own privacy."* A similar vision came from Respondent 5, who mentioned that her brother had rented a flat where they would like to go. Respondent 2 gave this assessment: *"Maybe everything will change and I'd be finally able to resolve everything."*, while Respondent 3 also considered the need to tackle personal matters as paramount, talking about problems with her former partner, *"She'd tried already to take it up with the police."*

Zero prospects and no ambitions were evident in the attitudes expressed by Respondent 6 on any possible changes, *"I'm not interested and I have no idea where I could even go."* and Respondent 7 talking about being unable to visualize any possible future, and also in the opinions given by Respondent 9 in connection with any opportunity to acquire her own housing, where she believed that it would accomplish nothing, and by Respondent 11, who saw no reason to look far ahead into the future: *"I don't think I'm going to be here long. I'm tired of life because it's completely empty."*

The opposite position was presented by Respondent 15, whose current lifestyle could be described as currently getting by.

"What comes next doesn't concern me." Respondent 8 put her partner's needs in the forefront when she pointed out, "I would've liked to live normally and have children." Other visions were presented in Respondent 12's thoughts touching upon debt relief: "If I could just get rid of all my debts and enforced judgments." and other priorities mentioned by Respondent 14, "To have my daughters live better than I do." and Respondent 13, thinking about starting again from scratch and returning to the town where he had previously lived, justifying it by saying, "I was routinely considering to buy a tent and go back there again as I would certainly get work."

The next category examined how the respondents are able to raise money to meet their essential needs.

Several respondents highlighted the benefits of having a job, such as Respondent 1 who was working to earn money, "...unlike others who are merely scrounging off the state." and Respondent 3 who claimed, "If I want to live decently, I have to work." Respondent 8 also characterized a job as critical, saying "We'd always managed to earn enough to live in an apartment or hotel.", while Respondent 11 talked about earning money from temporary work or getting it from someone. Respondent 15 concurred, "My income is what I earn somewhere temping or what I'm finding with others and I'm selling, picking up and such." But only Respondent 14 admitted not having enough, as she is only collecting a disability pension and has income from her partner. Neither Respondent 6, who was receiving emergency welfare benefits, nor Respondent 7 ever felt any material deprivation, with the latter saying, "there are lot of things sometimes found even in containers." An interesting view was presented by Respondent 2: "I've always been able to take care of myself because nothing scares me, not even death. If you've got nothing to lose, then there's nothing to be afraid of..." But the opposite opinion was also evident in replies given by several respondents, such as Respondent 4: "The emergency welfare benefits I receive are not enough...at least my girlfriend helps me when I need something, mainly with food.", or Respondents 10 and 13 both living on social benefits, or the answer provided by Respondent 12 who has been regularly going to work, and yet "little money remains from my pay after maintenance and garnishments." Respondent 5 also confirmed that she did not have enough funds, relying on just her partners' incomes, as did Respondent 9 receiving an old-age pension, "To survive, we'd need at least a thousand euros with my son in order for us to live decently."

In terms of everyday shelter, Respondents 6 and 14 both said that they had been staying for some time with friends. Respondents 1, 4, 5, 11 and 12 were spending nights in shelters social services provide. Shelters provided by social services were used by Respondents 2, 3 and 13. Respondent 7 replied that he was living in public spaces, sleeping in the woods or anywhere else he could find. Respondents 8 and 10 were living in a little cabin, while Respondent 9 described her catastrophic situation as "living under the trees in a neighborhood of prefabricated panel houses... where else can I go?" Respondent 15 described his situation as "I'm squatting - I'm not going to spend the night in a shelter or any other facility."

Regarding present or past use of social services, the respondents tended mainly to have used primarily low-threshold social services (night shelters and low-threshold day centers). Respondent 1 pointed out that he was spending nights in a shelter for the second time, as was Respondent 12, while Respondent 10 mentioned the same experience with the social service as did Respondent 11, saying that he had been spending nights in a shelter. Respondent 4 and 5 saw shelters as the only available possibility in light of their unfavorable situation, while Respondent 4 claimed that she had been staying in one ever since she had the ability to do so and Respondent 5 saying "that I started going to shelters when there was no longer any other options available." Regular visits to a low-threshold day center were also confirmed by Respondent 15, saying, "I go there were friends... I can take the time to relax and talk with the other people there". Respondent 2 was staying in a shelter, noting,

"This isn't the first time I've been living on the street and I'd already been in shelters in Prague." as was Respondent 3, who said that it was the first time she had been in one. Respondent 8 said that she only used social services when either she wanted to change syringes or was looking for work, while Respondent 13 also confirmed his experiences with a range of social services, commenting that "we had bounced between several facilities." On the other hand, Respondent 6 was opposed to the social services that are provided, pointing out "I've always had somewhere to live." Such opposition was also reflected in statements by Respondent 9: "I would never go there, I wouldn't think of it.", by Respondent 14: "I never had any interest in seeking help from social services, I always knew how to take care of myself." and by Respondent 7, who took the same view of never seeing himself utilizing the existing social services.

4 Discussion

In light of what was told to us, there is no general and universal scheme in the case of the homeless to describe how homelessness originates. Homelessness is often enough influenced by not only a single factor, but in many cases practically due to the interconnection and interaction of subjective and objective factors. In the case of homelessness, it can be mentioned as a multifaceted phenomenon affecting all dimensions of an individual's life, including further behavior and actions taken against both inside themselves and against their social environment.

In terms of reviewing how the respondents evaluated their current precarious existences, visible contrasts in thinking were encountered, identifying significant heterogeneous elements in their perceptions of homelessness as a sociopathological phenomenon. There were respondents that felt determined and motivated to lead their lives, while others looked apathetic or even frustrated with life, which was not solely due to being homeless, but reflected other problems they could not control and were unable to solve. In this context, it was simultaneously possible to note efforts among the homeless with a true concern in seeking to resolve their problems, including social reintegration, and also those people whose indifference and total disinterest in their lives was present, to differentiate themselves.

In examining the category covering a subjective vision of the future, the ambition most commonly encountered was to become independent and acquire their own housing, a primary and essential factor for survival with a decent lifestyle alongside the importance or tackling their own personal problems, which is the basis for a renewed social restart.

The respondents were able to earn enough money to survive mainly through work, something they mentioned in interviews which came from either long-term or short-term activities, although some were receiving emergency welfare benefits. Here two respondents were receiving old-age/disability pensions and all of them were economically active, yet despite this, a contrast in thinking could be also perceived among the homeless people regarding the significance of working (and the benefits derived from it) and among the people who were only resigned to receiving emergency benefits and often unable to provide for their own essential needs. In this context, the existence of so-called "alternative sources" of income can be highlighted, characterized as one possible strategy for homeless people to survive.

When examining the answers provided by the respondents, it was further seen that the vast majority of them were currently using the existing and available portfolio of social services. According to Dávidková (2017), social services can be identified as an important tool of social policy, which serves to solve, prevent or eliminate the unfavorable social situation. The reasons for utilizing them by respondents consisted of securing some form of accommodation, alongside using them as a way to spend idle time and contacting other people. On the other hand, there were a number of reasons encountered for strictly refusing any assistance (pride, shame, concern about taking care only of

themselves) from either public or private social services providers and relying exclusively on their own capabilities and capacities for surviving without a home.

In terms of securing accommodation every day, what prevailed among those respondents utilizing the full range of social services was that they were spending nights in shelters of a low-threshold nature or in other types of shelters provided by social services. On the other hand, those respondents not utilizing the existing range of social services preferred primarily to look for temporary shelter in open areas, mainly public spaces in cities with no increased concentration of people (either gardens or recreational facilities).

5 Conclusion

Homelessness can be described as a modern and ever-deepening social phenomenon. In this respect, it is important to clarify that no one ever expressed a free choice to be homeless, but rather it was often the consequence of several interacting factors. Homeless people represent a specific subculture within modern society whose characteristic expressions are of how they conduct themselves and behave. No one is going to claim in this respect that homelessness is the most significant challenge faced in terms of social policy, but there do exist specific, structural weaknesses in the direction society is heading.

Likewise, we advocate the necessity for society to acquire objective and unbiased information about the causes, expressions and consequences of homelessness. Survival strategies may also provide more opportunities and tools for homeless people to survive, regardless of whether they became homeless through their own fault or in connection with other aspects of losing their homes.

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Primary Paper Section: A

Secondary Paper Section: AO

PAYMENT DISCIPLINE OF BUSINESS IN THE EU COUNTRIES

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Scientific Paper was elaborated within the framework of the projects KEGA 001UCM-4/2016, and GAAA 2018.

Abstract: An important condition for a good payment discipline practice of businesses is to keep the maturity date of financial obligations, which seem to be the biggest threat of failure in the business sector. Receivables become a risky asset that has a negative impact on the solvency of businesses. We address the issue of insolvency through cluster analysis. The main objective of this study was to analyze the categorization of EU member states according to several pre-determined aspects of corporate insolvency in 2016. A traditional hierarchical cluster analysis with Ward's method, and a non-hierarchical k-mean clustering were applied. The European Payment Report 2016 and Doing Business 2017 data were used for the analysis. As a result of the analysis, the member states of the EU fall into three basic groups according to the structure of insolvency indicators. A research question was set, but it did not explicitly confirm the classification set by us.

Keywords: payment discipline, insolvency, payment of receivables, cluster analysis

1 Introduction

The business environment represented by European business has been suffering for a long time because of insufficient payment discipline of business partners, which in many cases results in insolvency of business entities. When assessing the public sector of the EU countries, the payment discipline is even more critical. The current business environment shows an expanding trend of purchasers, who fail to meet their financial obligation, causing problems that spread as a chain reaction in the economy and business relations (Grančay et al. 2015), as well as thousands of companies fall into insolvency (Rahman et al. 2017; Ključnikov Belás, 2016; Michalski 2014). A large number of European businesses have suffered financial difficulties in the recent years due to late payments and their number is still increasing. Disparities are recognized in different regions of Europe in terms of regional and economic development (Simionescu et al., 2017; Bicekova, et al., 2015), as well as in the context of payment discipline (Duřová Spiřáková et al., 2017; Klieřtiková et al. 2017; Imrovič, 2013). This situation is further associated with a loss of workplaces (increasing unemployment), and this problem in long term is highlighted by several professionals (Obeng, 2017). The situation results in worsening economic and social situation of the country. The small and medium-sized businesses are mainly endangered, which are waiting too long for payment of invoices or not receiving payment at all. These businesses are struggling with financial deficit, which hinders their further development (Siničáková et al., 2017; Tóth & Mura, 2014). It was necessary to create a common European legislative document to prevent the trend of payment delays, thereby simplifying the methods of invoicing and receiving payments in time. The Directive 2011/7 EU on combating late payment in commercial transactions was adopted on 16 February, which is also aimed at improving competitiveness of the EU member states. The Late Payments Directive, as well as its assessment was adopted under the Regulatory Suitability and Efficiency Program (Commission REFIT)¹ to ensure that the expected benefits are met. Reducing the number of late payments would help to expand and sustain improvements not only for individual businesses, but the economy of the country as well (European Commission, 2016).

¹ REFIT is was set up as a program for suitability and effectiveness of regulations by the EU Commission. The main objective was to simplify the EU legislation and reduce the regulatory costs. It contributes to clear, stable and predictable regulatory framework that fosters the growth and employment (http://ec.europa.eu/smart-regulation/refit/index_sk.htm).

2 Literature review

Nearly 78% of the businesses in Europe experienced late payments during 2010-2016. Late payment might have negative impact on public procurement and cross-border trade, as it often results in insolvency and job cuts. There is little evidence that this directive has an impact on payment behaviour and the practice of late payments (Wood, 2007). The most unpleasant consequence of late payments is the insolvency (Režňáková, 2010). The problem of insolvency and bad credits started in the 60s of the 20th century, when the finances of businesses were used to finance the state budget expenditures (Majková, 2008). The end of the 20th century brought a long-term improvement in the payment discipline of business entities, which resulted from the fact that the reforms led to significant improvement of the business environment, as well as the interest rates on three credit products started to fall (Podnikateľská aliancia Slovenska, 2011). In the current economic climate it is very difficult to set up and maintain a business activity. The European businesses are important to maintain economic prosperity and should provide workplaces. The research of Laureti (2012), Andrejovská and Bánociová (2014), Ključnikov et al. (2017) proves that it is necessary to implement measures in this field of activity, because half of all enterprises do not survive the first five years of their existence. Failure to pay invoices results in existential crisis. On average, up to 200,000 businesses established in the EU go bankrupt, with a quarter of these bankruptcies showing cross-border character. This results in 1.7 million job losses (EU Commission, 2016). Strelcová (2012) notes that insolvency occurs, when businesses are unable to meet their financial obligations, resulting from business relationships, relationship with financial institutions, employees and other organizations at a certain date. Permanent insolvency can result in bankruptcy. Although the business environment is constantly improving and possibilities of corporate financing are increasing, there are several causes of insolvency (Borovský, 2001; Bylok, 2016; Mihokova et al., 2016). According to Kubranová & Sochora (2009) one of the causes is the primary insolvency, which defines overdue of liabilities after maturity over the overdue receivables. Secondary insolvency reflects the condition when the enterprise has more unpaid receivables towards the third party than the sum of its liabilities. The external causes of insolvency are the negative economic situation resulting from the global economic crisis, insolvency of buyers, complicated recovery of receivables, as well as the reluctance of business partners to repay their financial obligations (Melicheriková, 2008). In this respect, the directive of the European Commission was aimed to help healthy businesses survive (Benda-Prokeiová et al., 2017) provide a second chance for honest entrepreneurs, as well as to protect the right of creditors to obtain their finances back. Serving the interest of all parties, the procedures under the directive should be rapid and effective, should help to preserve workplaces, maintain customers and values in the viable companies. The differences in bankruptcy law of different member countries can result in legal uncertainty and unpleasant business environment. The crucial issues are the following: the time needed to recover receivables, the conditions to start proceedings, the average maturity date of receivables and others (European Commission, 2016).

3 Data and methodology

The aim of the article was to analyze and evaluate the payment discipline and insolvency of enterprises in the EU through cluster analysis. The analysis focused on categorization of EU countries according to several aspects of their insolvency. Several scientific methods can be used to explore deeper contexts. We decided to use cluster analysis. It enables not only to make calculations but excellent presentation of data in form of graphs. This method is used by many scientists e.g. Tvaronavičienė M., & Razminienė K (2017). The cluster analysis was conducted on a statistical sample of 25 EU member states with the exception of Cyprus, Luxembourg and Malta

(there was no available data in 2016). We gained data from the European Payments Report 2016 and the annual report of Doing Business 2017.

The following variables were chosen for analysis:

- P1 - average contractual maturity of receivables (days),
- P2 – average delay in payment of receivables (days),
- P3 – annual income written off due to non-payment of receivables (%),
- P4 - time requirement for recovering receivables (years),
- P5 – financial burden of recovering receivables (% of the bankruptcy procedure).

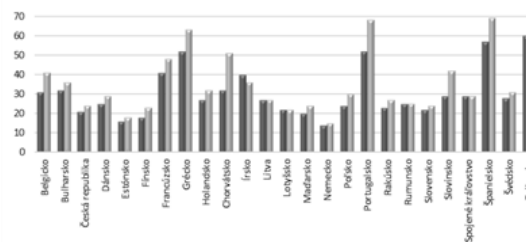
The research objective set focused on categorization of countries (based on predefined specifications) in three different clusters. We have formulated the following assumption: „Is it possible to make a clear distinction between the countries with an excellent payment discipline; countries with high level of payment risk, and countries with a certain degree of payment risk?“ We were trying to confirm or reject this assumption.

Before the cluster analysis it was necessary to conduct data standardization with a help of Z-score. Each item was a subject of standardization/normalization by subtracting the mean value, dividing it by the standard deviation, thereby achieving the mean value zero. Subsequently we visualized and evaluated the data and their signs of clustering in terms of mutual distribution of countries (Meloun, Mílitký, 2004). In the next step, based on the acquired input variables we proceeded to prepare the cluster analysis. The categorization was carried out using a number of methodological approaches to study the data, which is based on the concept of Euclidean metrics (Halkidi et al., 2001 and Everitt et al., 2001). In accordance with the objective of the article, hierarchical and non-hierarchical methods of clustering were used. The Ward Linking method (commonly used in practice) was chosen as a hierarchical method. K-means clustering was applied as a non-hierarchical method. To apply this methodological approach it is necessary to form an optimal decomposition of objects with a predetermined number of clusters (in our case it means three clusters). There we can see the difference in comparison with the hierarchical method, where the number of clusters was not predetermined. The statistical analysis was performed in statistical programming language R, using psych, GPArotation, nFactors, cluster and NbClust.

4 Results and discussion

The average contractual maturity in B2B sector (based on the analyzed sample) varied from 14 days in Germany to 60 days in Italy in 2016. This indicates significant differences in the EU that affect factors such as business practices, culture, payment morale and especially the unpleasant economic situation in southern countries. Even though contractual maturity of all countries is in line with the Late Payment Directive of the EU, the efforts to unify it in the territory of the EU forces the PIIGS to make greater efforts to curb them, which can result in an increase of unpaid receivables and further weakening of the economy. Worse situation can be detected in the public sector, which should be an example for other sectors, but up to 9 European countries (Croatia, Bulgaria, Belgium, France, Ireland, Portugal, Spain, Italy and Greece) do not comply with the 30-day contractual maturity directive. An important factor in payment discipline was the actual settlement of receivables resp. delay of receivables. Nearly all of the countries experienced late payment in 2016, with the exception of Lithuania, Latvia, Ireland and the UK. Delayed payments also occurred in the most developed Scandinavian countries, ranging from 3 to 5 days. The largest pressure to accept longer terms of payment (58% in Denmark, 73% in Finland, 52% in Sweden) was developed by multinational companies. The worst situation was detected in southern countries with a delay of 11 to 20 days.

Figure 1. Comparison of contractual and actual maturity within the EU (days)



Source: own processing based on Intrum Justitia data (2016) contractual date of maturity, actual payment duration

Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Greece, the Netherlands, Croatia, Ireland, Latvia, Lithuania, Hungary, Germany, Poland, Portugal, Austria, Romania, Slovakia, Slovenia, the UK, Spain, Sweden, Italy.

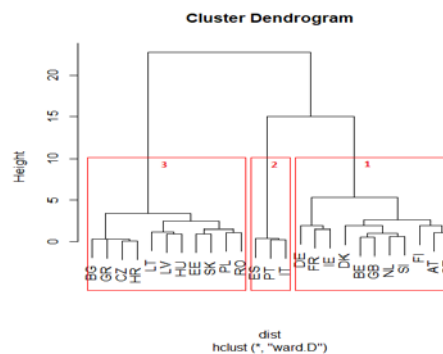
Bad debts, which are not calculated as a tax expense were mainly characteristic for southern states such as Spain (3%), Italy (3,8%), Bulgaria (4,2%) and mainly Greece with 5,8%, which was 3,6 percentage points higher than the EU average of 2,2%; and 5,4% percentage points more than Denmark with the smallest amount of non-repayable debts of only 0,4% of the annual income. The time to recover outstanding receivables in individual countries of the EU is ranged from 0,4 years in Ireland to 4 years in Slovakia. Slovakia achieved the worst results with inefficient utilization of debt collection agencies resp. receivables not dealt with in time, lack of trust in repayment or worries about losing the business partner. The most effective debt recovery was recognized in Ireland, where the creditors were paid within approximately 144 days (0,4years). The cost of debt collection was the highest in Italy, 22% of the bankruptcy proceedings costs. This was followed by the countries of V4 group with a cost range of 14,5-18%. The lowest investment in debt collection was registered in Finland, the Netherlands and Belgium (3,5%).

5 Hierarchical and non-hierarchical methods of cluster analysis

Ward's method

The Ward's method, which is based on the Euclidean distance was chosen from the hierarchical methods of clustering. The output of this method is a dendrogram (Figure 2), which has ranked the European countries into the following clusters:

Figure 2. Ward's dendrogram



Source: own processing in the statistical programming language R

The first cluster was formed by those European countries (Belgium, Denmark, Finland, France, the Netherlands, Ireland, Germany, Austria, Slovenia, the UK, Sweden), which have shown the best payment discipline in the survey sample. We can talk about developed economies with an average contractual maturity of 28 days, where the average delay in settling claims were 4 days, and it equals to the European average. The cluster showed low values in case of percentage of annual income

written off due to non-payment of receivables and the costs of recovering claims. Surprising was to see Ireland in the cluster of developed countries since it had been threatened by debt crisis (PIIGS). This has probably happened, because Ireland significantly increased the average contractual maturity period by 12 days in 2016 compared to the previous year, which means that the average settlement of claims in the country is 4 days before the contractual date of maturity. Another variable, in which Ireland preceded all the European countries, was the recoverability of receivables within a period of 144 days.

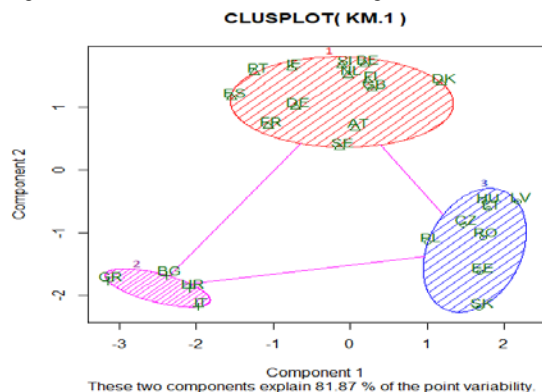
The second cluster was formed by some of the countries mentioned as PIIGS (Portugal, Spain, Italy). These were the countries with the worst results of payment discipline, where creditors, despite the longest contractual maturity of the analyzed sample (57 days in average) were waiting for their claimers to be settled by 16 days longer than the agreement in the contract was. The disobedience of the cluster was confirmed by the above than average 3% write-off of annual income due to unpaid receivables.

The third cluster was formed by V4 countries, as well as the Baltic and other smaller countries (Bulgaria, Czech Republic, Estonia, Greece, Croatia, Latvia, Lithuania, Hungary, Poland, Romania, Slovakia), which can be characterized as average countries. On the basis of the input variables we cannot clearly categorize them as countries with payment discipline resp. indisciplined. Checking the input data we found that these countries have achieved better results than countries in the first cluster in terms of contractual maturity (24 days) and delays (4 days), but on the other hand they are characterized by the longest duration of recoverability of receivables (3 years). The Ward's method grouped Greece among the average countries, but according to values of variables Greece should be rather ranked among the countries with high payment indiscipline.

The K-means clustering

The second method used was the method of the closest center of gravity, K-means. Since it is a non-hierarchical clustering method, it was necessary to set the number of clusters (3) based on the comparability criterion.

Figure 3. The results of K-means clustering



Source: own processing in the statistical programming language R

Similarly to Ward's Method, the first cluster consisted of the most developed EU countries (Belgium, Denmark, Finland, France, the Netherlands, Ireland, Germany, Portugal, Austria, Slovenia, the UK, Spain, Sweden) except 3 countries of the PIIGS group. According to K-means clustering, not only Ireland, but Portugal and Spain as well fell into the category of countries with payment discipline.

The second cluster of countries with payment indiscipline is formed by Greece, Italy, Bulgaria and Croatia. Their categorization in this cluster can be explained by high, almost a double percentage (4,2% in Bulgaria) of annual income written off due to non-payment of receivables compared to the EU average of 2,2%, as well as a time-consuming recovery of the

receivables over a period of 3.3 years. Similar situation was detected in Croatia with a length of debt recovery 3,1 years in 2016.

The countries labelled as average according to K-means clustering (Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, Slovakia) belong to cluster three with an exception of Bulgaria and Croatia, which fell into the second cluster as in the case of hierarchical clustering. Using proximities we compared the distance between the clusters. The results show that the second cluster with its characteristics was closer to indiscipline in payments (p-value=0,81) compared to the group of countries with payment discipline (p-value=0,85). Despite the best average results of indicators, the contractual maturity (22 days), the delay in settlement of receivables (2 days) and the percentage of annual income written off due to outstanding claims (1,7%) this fact was caused by assigning the greatest importance of indicator of recovering receivables at 12,5% of the bankruptcy value, in which the cluster shows the worst results.

Evaluation of results by using both methods of clustering

When evaluating the results we received by hierarchical and non-hierarchical clustering, we focused on confirming or rejecting the assumption, where we predicted creation of three clusters, where each cluster should involve countries with the same results. The first cluster was formed to involve countries with a payment discipline. The second cluster was formed to include countries with no payment discipline with a high degree of payment risk. The third cluster was expected to involve the countries with payment instability and a certain level of payment risk (average countries).

The results (Table 1) confirmed that 14 countries fell into the same cluster according to both models. Since the models have assigned different weigh of importance to each input variable, the categorization of other countries was not absolutely clear according to methods applied, and therefore we cannot confirm the question and the assumptions that countries can be clearly categorized as disciplined, indisciplined and average.

Table 1. Comparison of cluster analysis results

Country	Ward's method	K-means clustering
Belgium	1	1
Bulgaria	3	2
Czech Republic	3	3
Denmark	1	1
Estonia	3	3
Finland	1	1
France	1	1
Greece	3	2
the Netherlands	1	1
Croatia	3	2
Ireland	1	1
Latvia	3	3
Lithuania	3	3
Hungary	3	3
Germany	1	1
Poland	3	3
Portugal	2	1
Austria	1	1
Romania	3	3
Slovakia	3	3
Slovenia	1	1
the UK	1	1
Spain	2	1
Sweden	1	1
Italy	2	2

Source: own processing

The most precise grouping is a cluster of countries with payment discipline: Belgium, Denmark, Finland, France, the Netherlands, Ireland, Germany, Austria, Slovenia, the UK and Sweden. These were the most developed countries with payment

stability in the EU, with the exception of Ireland, which has shown different value of indicators regarding the delay in settlements of claims and recovery of receivables. Italy fell into the group of countries with payment indiscipline with the highest delay in payment of receivables with an average duration up to 20 days, as well as the recovery costs of 22% of the bankruptcy proceeding. The Czech Republic and Latvia could not be clearly categorized, so they belong to a group of countries that have neither the best nor the worst payment discipline.

Unlabelled countries have become a part of more clusters, but certain similarities were followed also in this case. In most of the cases, the group formed by Estonia, Lithuania, Hungary, Poland, Romania and Slovakia was incorporated into the third cluster (average countries), but in K-means clustering they have shown the highest payment discipline. The reason of transfer of these countries was the value of their input variables P4 and P5. These countries have achieved the worst results of input variables in the EU. The time required for debt recovery ranged from 2 to 4 years and the costs related to that ranked between 9 and 18% of the bankruptcy proceeding, while the longest time interval (4 years) and the highest costs (18%) were registered in Slovakia. Another similar group was formed by Greece and Croatia, ranked as average in hierarchical clustering model. Other models ranked them as countries with payment indiscipline. Even the real data reflected their payment instability e.g. Greece has the highest percentage of annual income written off due to non-payment of receivables up to 5,8%. Bulgaria compared to Greece and Croatia was ranked average also according to K-means clustering.

Interesting results were achieved by Spain and Portugal. These countries belong to the group of countries with payment discipline, but countries with payment indiscipline as well. Categorization to countries with payment indiscipline was due to 16 days of delay in claim settlement (Ward's method), while financial costs of debt recovery reach 20% of the bankruptcy proceedings. This is why Portugal can be found among the countries with payment discipline according to K-means clustering.

The European Central Bank (2016) and the European Payment Report traditionally ranked Austria and the Scandinavian countries among the countries with payment stability. The northern countries are characterized by shorter contractual maturities, lower occurrence of late receivables, so they have a low payment risk. There is also a stable payment discipline in the Austrian business environment, where proposals for accepting longer payment terms are mainly the responsibility of the public sector. Further research by Checherita-Westphal, et al. (2015) Ključnikov, et al. (2017) Parkitna, et al. (2016), Rocholl, et al. (2016) which monitored the payment insolvency of the EU countries in different time intervals were identical to results achieved by us with the help of selected methods of cluster analysis. The results of analysis show similarities in identifying countries with payment discipline. These are Denmark, Finland, Austria and Sweden. Further economies with payment stability are Belgium, France, the Netherlands, Germany, Slovenia and the UK. Relevant differences between the statements of Sticlosu and Pîrvulescu, (2015) show the categorization of the most risky countries in terms of payment discipline. We have not achieved a full compliance in neither of the models. According to Checherita-Westphal, et al. (2015), Ireland is considered to be a country with worse payment discipline, while our models ranked the country among the most disciplined in payments. Good position of Latvia and Lithuania is reflected by the exemplary behaviour of businesses to meet their obligations, as the settlement of receivables is realized during the contractual period, while most of the businesses in these countries do not expect an increase of risk of late payments the next year. Even if companies are aware of the European directive on late payment in Estonia, only 10% of late payments are realized in average duration of 2 days. Some of the V4 countries (Czech Republic, Slovakia, Hungary) are ranked among countries with good payment discipline, as they were characterized by a short contractual maturity and a delay in the

settlement of claims. Our models have characterized these countries as average. The most risky economies in terms of payment discipline according to the ECB (2016) and the European Payment Report (2016) were the countries of southern Europe. Greece, Spain, Portugal and Italy have been suffering of financial shock for a long time. The business environment is characterized by a need to respect longer payment terms, despite of the fact that these countries have the longest average contractual maturity, which is an obstacle to growth of businesses and results in existential problems.

6 Conclusion

Late payments are currently the biggest threat to business environment across the EU. They worsen the payment discipline of individual economic entities, which might result in insolvency spreading through the whole economy. We can assess that the cluster analysis conducted on a sample of 25 member states of the EU with an exception of Cyprus, Luxembourg and Malta, has only partially confirmed the conclusions of our research question. We expected the individual countries to be grouped based on their similar features. The assumption that the first cluster will be made up of countries with the best payment discipline was not confirmed. The second cluster was expected to include countries with payment indiscipline. The question was confirmed, but only in case of Ward's method applied. The third cluster aimed to group countries with payment instability and a certain level of payment risk (average countries) was confirmed via K-means clustering. The analysis conducted, as well as the different research results show that the member states cannot be clearly classified as disciplined or undisciplined. Differences still occur in the monitored input variables, which show different values in different countries. It would be necessary to increase the number of observed variables, as well as the methods applied. If we want to assess the payment discipline of businesses and reduce the insolvency, the suitable solution is to prevent the occurrence of recoverable receivables by better utilization of information received about customers and the customer behaviour.

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Primary Paper Section: A**Secondary Paper Section: AH**

CIRCULAR ECONOMY AS A NEW MANAGERIAL APPROACH

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The contribution is part of the scientific project VEGA no. 1/0380/17 "Economic efficiency of electro mobility in logistics", conducted at the Faculty of Commerce of Economics in Bratislava.

Abstract: Circular economy is a concept that is shifting from a linear economy system to a "ring" system in terms of a product or raw material reuse, its reprocessing and recycling. The circular economy is a fulfilment of sustainable development. It has an impact on consumers, non-profit organizations, government institutions, cities and municipalities, but its main actors are companies. It is linked to invention, innovation and investment. It is the basis for new business models and is a new management approach that opens up new business opportunities.

Keywords: circular economy, sustainability, business model, managerial approach

1 Introduction

Circular economy reflects the transition from the current model of the linear economy, dependent on the high consumption of non-renewable resources. Integrating circular economy into corporate business brings a number of benefits associated with new business models, marketing, corporate culture, but also profitability and competitive advantage. On the other hand, it presents a number of challenges in the form of limited opportunities to use new technologies, innovations, changing product features and their lifecycles, and others.

The aim of the paper has been to clarify the essence of circular economy and some of its aspects that we consider to be essential from an economic, enterprise and social point of view. Following the above mentioned, our ambition was to present the circular economy from the point of view of the business sphere in Slovak conditions.

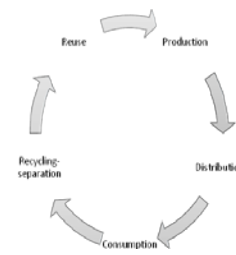
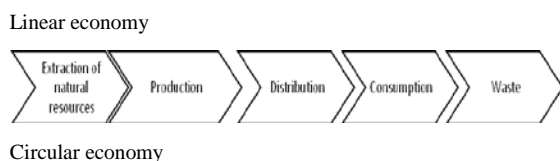
2 The essence of circular economy

2.1 Definition of circular economy

Pearce and Turner presented the concept of circular economy in their work *Economics of Natural Resources and the Environment* in 1989. They pointed out that a traditional open-ended economy was developed with no built-in tendency to recycle, which was reflected by treating the environment as a waste reservoir [6].

The circular economy is an interpretation of instructions how to leave zero or at least the minimum ecological footprint, both for personal and production consumption. According to Rusko and Pietrucha, the circular economy is based on the idea that all product and material flows could be re-integrated into their cycle after their use, when they become new sources for new products and services [5]. Thus, it enters into the linear economy model as the "circle" principle, in terms of reuse of the product or raw material, its reprocessing and recycling (Figure 1). Waste is perceived here as a source.

Figure 1. Shifting from a linear economy to a circular economy



Source: [5].

An effort to promote efficient resource utilization, pro-environmental oriented innovations, environmentally - friendly products and services, as well as the application of pro-environmental managerial tools like voluntary EMS or EMAS tools are all parts of circular economy.

Within circular economy, the following key elements have been identified:

- the favoritism of regenerative (renewable, reusable and non-toxic) sources
- the use of waste as a source,
- the design that allows products re-use and prolongation of their life cycle,
- to preserve and extend what has already been produced,
- collaborative value,
- introduction of digital technologies,
- the prices or other feedback mechanisms should reflect real costs.

According to the Slovak Institute of Circular Economy - INCIEN the circular model is to ensure the competitiveness of the countries, their stable economic growth and healthy environment [7]. The yield in circular economy is based on the efficient use of natural resources, achieved by the effective valuation of used materials, products and components. Their constant return to the technology cycle presents the closure of material flows. This minimizes the waste, cost of material inputs and energies needed to produce new products. The main elements of this concept are the utilization of renewable energy sources, eco-innovations, rental, sharing and support of local business.

The circular economy thus represents a regenerative system that minimizes waste, emissions and energy deficiency by slowing, closing down and narrowing material and energy flows.

2.1 Selected elements of circular economy

Following the essence of circular economy, we consider it relevant to mention the category of sustainability and sustainable marketing, responsible consumer and reverse distribution.

Sustainability is a global trend that includes the entire business sphere and all aspects of life. It makes business meaningful and is related to constant improvement, innovations and social responsibility. It is an important stimulus of product development and production. It embodies itself with products whose development, production, operation, consumption and disposal are less demanding for raw materials and energy consumption, produce less waste or contain less harmful substances. The importance of the individual dimensions of sustainable development reflects: (1) the environmental aspect that is its basis, (2) the economic aspect as a tool for its achievement, and (3) the social aspect that is the goal of sustainable development. Circular economy is a system that is "more sustainable" than a linear economy.

Sustainable developments affect the entire industry. Update in a production - consumption system in the environmental and

social context allows for social responsibility to be exercised in exchange. This situation has led to the emergence of social marketing. According to Kita, sustainable marketing takes into account the environmental impact of products and marketing activities and provides a complex situation about them to a customer [3]. Oreský characterizes sustainable marketing as a process of creating, communicating and delivering value to customers, where natural capital and human capital are protected or improved/ enriched throughout the mentioned processes [4].

Sustainable marketing can be described as a bridge between firms and consumers based on win-win strategy. With regard to sustainability, it is also necessary to guide consumers towards such behavior. This is the principle that if consumers do not start to behave responsibly and environmentally friendly, environmental companies will not have the chance to succeed in the market with such strategies.

Several authors seek reasons for environmental behavior based on models. S. Schwartz is among the pioneers of this effort, who assumed that the only direct determinant of pro-social behavior is personal standards of an individual, such as feelings of strong moral duty in people making an effort to act in favor of society [2]. Vokounová also says that sustainable behavior depends on the characteristics of a person (such as his/her knowledge, responsibility, awareness of circumstances) and on the society in which he/she lives [8].

Change in the value system of people is also one of the conditions for fulfilling the essence of reverse distribution. While forward-looking distribution is primarily concerned with the delivery of finished products to consumers, reverse distribution ensures that the products or materials are moved back from the consumer to the production process to exploit their residual value.

Reverse distribution is the process of transporting products from their typical final destination to the point of capturing a value or proper disposal [1]. Its role is related to the consumption of non-renewable resources and their renewal. The use of non-renewable resources requires the closing of the material flow cycle. Reverse distribution diverts these resources from disposal in municipal landfills or waste incinerators and returns them back to circulation. It can be assumed that, in the future, reversal distribution can play an equally important role as a forward-oriented distribution. We would like to add that the role of reverse distribution could also be seen in the process of energy valuation of materials.

Approaches of individual authors to reverse distribution differ, depending on a number of factors, such as, for example, the nature of the industry, the subjects of distribution, the tasks or, for example, the activities. In these definitions, two key aspects of reverse distribution - ecological and economic - are being pursued at different intensities. Both aspects are significant in the business and monitored based on legislation and economic objectives. An important role here is the marketing, its tools, especially the product, its properties, design, and communication, which affects the economy of reverse distribution and its effects.

3 Research into the introduction of a circular economy system into the practice of Slovak business entities

3.1 Research project

Following the theoretical background and trends in the circular economy, we conducted an empirical research in September-October 2017 to observe the situation with the implementation of its elements within the companies established in the Slovak business environment. We addressed 500 domestic and foreign companies. The survey involved 180 businesses (n = 180). The return on questionnaires was 37.6%. The survey was conducted using the CAWI method and a standardized online questionnaire. The online questionnaire was programmed so that it could not be sent back incomplete. Respondents' responses

were automatically recorded in the online SQL database. This solution, in addition to ongoing monitoring, also allowed flexible evaluation of partial results.

Although the issue of circular economy affects all subjects, following the focus and purpose of our contribution, only the business entities have formed our sample according to the criterion of size (number of employees), scope, legal form and revenues.

In terms of size, microenterprises (with less than 10 employees) formed 30% of the sample, small enterprises (10-49 employees) formed 20%, medium-sized enterprises (up to 100 employees) formed 40% and 10% formed large corporations with more than 100 employees. In terms of determining the scope of the company, we proceeded from the national statistical classification of economic activities SK NACE rev. 2 (Table 1). From the point of view of legal form, business entities, both physical and legal entities, were addressed, 10% of which were companies with foreign ownership and 90% were Slovak entities.

Respondents were the owners of the companies, the executive officers and the directors. Revenues from all the survey participants ranged from EUR 0.1 mil. - 100 mil.

Table 1. Respondents' scope of business

Category	Amount (in %)
Agriculture, Forestry and Fishing	15
Industrial Production	35
Construction	30
Wholesale and Retail Trade	38
Transport and Storage	15
Accommodation and Catering Services	12
Information and Communication	4
Financial and Insurance Services	6
Administration and Support Services	25

Source: authors' own processing

The aim of the survey was to clarify and assess the situation related to a circular economy in the business environment in Slovakia. Based on that, the main research question has been formulated:

Q0: What is the situation in the field of introducing the circular economy system into the practice of Slovak enterprises?

From the main research question, the following partial descriptive research questions have been formulated through structured genesis:

Q1: What are the motives of Slovak enterprises to introduce a circular economy system?

Q2: How is circular economy introduced into the practice of Slovak enterprises?

Q3: What are the differences in the implementation of the circular economy system in the practice of domestic enterprises compared to the foreign ones doing business in Slovakia?

Q4: What are the benefits and problems associated with introducing the circular economy system in conditions of Slovakia?

In formulating the conclusions, we relied on the hypotheses that we established on the assumption that, in the conditions of the Slovak enterprises, circular economy is only in the starting progress and that the necessary tools and conditions are lacking in its implementation:

H1: Circular economy is not established in Slovak enterprises because of lack of knowledge, insufficient support and high financial, technical and personnel demands.

H2: The prerequisite for a more efficient implementation of the circular economy system in the practice of Slovak enterprises is higher awareness, culture, state support and competitive pressure.

3.2 Results and discussion

The questionnaire, we used to collect the data in the survey, consisted of the questions divided into the following areas:

- Knowledge, awareness of circular economy.
- Situation in circular economy in practice.
- Specification of the elements of circular economy in practice.
- Benefits and shortcomings of the circular economy system from the point of view of enterprises in Slovakia, motivation and preconditions for its introduction.

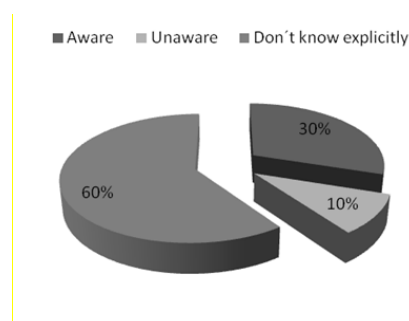
Knowledge, awareness of circular economy

From our point of view, it was interesting to note that only 30% (54) of the addressed enterprises explicitly understood the term "circular economy". There was no definite answer to 60% (108) of the addressed enterprises and 10% (18) did not know what this term meant (Graph 1). What is more, from those enterprises that understood the term "circular economy", 30% (16) were foreign ones doing business in Slovakia. However, subsequently, the situation with regard to the knowledge of circular economy improved and the respondents correctly connected it to the use of renewable energy sources, separation, economic and energy recovery, waste utilization, and so on.

Enterprises with experience in this field worked in agriculture (30%), industrial production (50%), construction (10%), wholesale and retail (10%).

Those enterprises that have understood this concept, have pointed to the relevant systems they have in place in their processes and activities, legislative measures, and participation in expert conferences on this topic.

Graph 1. Awareness of circular economy



Source: authors' own processing.

Situation in circular economy in practice

As a result of the situation regarding the introduction of the circular economy system, the enterprises involved have found that, when implementing it, legislation (90%), internal standards (70%), such as corporate guidelines, ethical codes, visions and missions, other norms of behavior or corporate culture, taken from a parent company, have been taking into account. In addition, they also cited the reasons for the implementation of this system to monitor foreign trends (52%), the introduction of EMAS voluntary tools (35%) and green product labeling (10%). Only two of the addressed enterprises have had the right to use the ecolabel (Table 2).

Table 2. Situation in an introduction of the circular economy system

Measures and Tools	Amount (in %)
Legislation	90
Internal Standards	70
Foreign Trends	52
EMAS Voluntary Tools	35
Eco-labelling	10

Source: authors' own processing.

Specification of the elements of circular economy in practice From the point of view of the specification of circular economy in practice, the following elements of the system have been the most common in the respondents' answers:

- (1) renewable energy sources (pellets, bio-waste, municipal waste) - 70%;
- (2) environmental innovations related in particular to waste, its collection and sorting - 45%;
- (3) waste heat utilization system (electricity generation for own use, aquaculture, refrigeration of own production capacities, air conditioning) - 30%;
- (4) green accounting - 30% and
- (5) green office - 30%.

Of the other elements of circular economy, 15% of the answers has demonstrated the use of rent (cars, energy, and laundry). The single addressed enterprise has not been used sharing economy (Table 3).

Table 3. Specification of an introduction of the circular economy elements

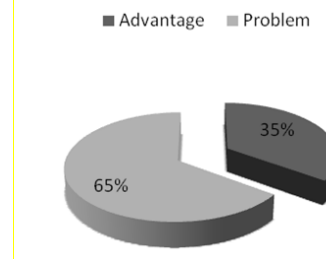
Element of Circular Economy	Amount (in %)
Renewable Energy Sources	70
Green Innovations	45
Waste Heat	30
Green Accounting	30
Green Office	30
Rental	15
Sharing Economy	0

Source: authors' own processing.

Benefits and shortcomings of the circular economy system from the point of view of enterprises in Slovakia, motivation and preconditions for its introduction

The introduction of a circular economy system has been identified by the addressed enterprises as a problem (65%) rather than a benefit (35%) (Graph 2).

Graph 2. Attitudes to the circular economy system



Source: authors' own processing.

The greatest deficiency of this system is seen by the addressed respondents as lack of transparency (insufficient or missing legislation and awareness) - 90%, rising costs of acquiring new technologies - 85%, lack of qualified workforce in relation to new technologies - 60%, increased education costs of employees - 50% and "bullying" and insufficient motivation from the state - 50% of respondents (Table 4).

Table 4. Shortcomings associated with the introduction of circular economy

Shortcomings associated with the introduction of circular economy	Amount (in %)
Lack of Transparency	90
Rising Costs of Acquiring New Technologies	85
Lack of Qualified Workforce	60
Education Costs	50
State Interference	50

Source: authors' own processing.

The answers of foreign enterprises doing business in Slovakia are worth mentioning. They pointed to a number of problems associated with the introduction of this system in the business environment. These shortcomings were mainly associated with

the problematic legislation, state bureaucracy, and lack of access to credit, lack of qualifications of the workforce, low environmental awareness in corporate culture, lack of awareness from the state and education.

Addressed respondents considered the greatest benefits associated with introducing the circular economy system the following: new business opportunities - 90% and the same 90% savings in costs. In addition, a better image and a favorable public opinion were considered as the benefit by 70% of the respondents. Among other benefits of this system introduced in practice, higher growth were added - 30%, as well as competitive advantage - 30%, new markets - 20% and higher product quality - 20% (Table 5).

Table 5 Benefits associated with introducing the circular economy system

Benefit associated with introducing the circular economy system	Amount (in %)
New Business Opportunities	90
Savings in Costs	90
Image and Favorable Public Opinion	70
Higher Growth	30
Competitive Advantage	30
New Markets	20
Higher quality production	20

Source: authors' own processing .

As measures to improve the situation in relation to the introduction of a circular economy system, addressed enterprises would welcome better transparency in legislation, awareness, motivation on the basis of waiving the various fees attached to this system, improving conditions linked to the use of new technologies (e.g. access to credit) and quality education.

Both hypotheses can be confirmed.

Summary

The circular economy as a global trend gradually becomes part of entrepreneurship and business activities in the conditions of Slovakia as well. It is not only the basis for new business models, it is also a new management approach, bringing new technologies, inventions and innovations. Finally yet importantly, it is linked to the emergence of new business and job opportunities.

Circular economy is a term that is often discussed in the countries of the European Union. This is apparently because of high degree of environmental awareness among the public as well as among owners and managers of companies and the corresponding conditions for the introduction and use of the circular economy system. According to Slovak INCIEN (2017), the environmental awareness of citizens in Slovakia is insufficient and the notion of "circular economy" is still unknown, although some individuals, companies, non-profit organizations and ministries have already begun the process of changing perceptions and setting the system up.

In the Slovak business environment, we can meet various "circular approaches", which are mainly used for reasons of cost reduction, lack of raw materials and their high price or pressure from customers and / or competitors. Typically, however, there are measures to reduce costs and are therefore primarily strongly economically motivated. However, with shifting to circular economy, they have little or no common features and have been approaching it only marginally.

Changing this situation will require, besides traditional measures in the form of legislative action, also a number of systemic measures. They include, in particular, the promotion of eco-investments and eco-innovations, the increase of recycling rates, the stimulation of efficient resource utilization measures, the promotion and use of eco-design, or the intensive communication of the issue of circular economy to public. In

addition, the latter will require increased awareness, education of public (consumers, employees) towards the topic of the circular economy. Also, Slovakia will have to prepare for changes in the economy related to this trend and set a strategy for shifting and introduction of circular economy at both macro and micro levels.

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Primary Paper Section: A

Secondary Paper Section: AH

TRANSFORMATION OF THINKING AND EDUCATION UNDER THE INFLUENCE OF INTERNET COMMUNICATION

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Abstract: The contribution deals with the impact of Internet communication on contemporary thinking and education and has the character of a theoretical study. The paper reflects the primer technological bases and the current state of the presented problem and concrete expressions of the transformation of thinking in the context of the use of digital media, using several author's approaches and opinions. The main objective of the paper is to define and in theory formulate changes of thinking and education related to the use and influence of the Internet and digital media. The author emphasizes the importance of maintaining a linear type of thinking to retain and stabilize education and knowledge, especially in the context of the young generation, which is the most affected and potentially threatened by digital media and information and communication technologies.

Keywords: Internet, thinking, education, cognitive processes, changes.

1 Introduction

Social notification means or mass media, in which we can partly include the Internet medium, perform now a very important role. It is no coincidence that we can meet also with their identification as a seventh great power. The impact they have on society as well as individuals is unprecedented. With constant development and emerging new ways of communication and exchanging information, we can assume that these impacts will continue to grow.

The Internet is currently understood to be the absolute certainty of our lives. Many people, especially teenagers and young adults, cannot imagine their everyday world without this media. It can be said that the Internet medium belongs to the most popular and the most used media of the present. It offers new forms of entertainment, job opportunities, it brings instant and constantly current and up-to-date information, communication over the Internet is constantly accelerating, it breaks the limits of time and space perception. It is similar with new types of media such as tablets or smartphones. Most of them already automatically provide their users with the ability to connect online, either via Wi-Fi or, for example, through data provided by a mobile operator, at any point and time, in order to take immediate advantage of the benefits of electronic media and the Internet.

We could say that today there are no formal restrictions on communication and other spheres of life resulting from slowness or geographical differences. We take it for granted that we are constantly "connected" through digital technologies. It is not a coincidence that children and teenagers are referred to as "digital natives". They are people, mostly born after 1990, which grew up with computers, the Internet and other technological achievements as a natural part of their native environment and living space. They represent a generation that spends every day on social networks, whether by online communication with their peers or by entertainment. They have been using the Internet, new media and technologies more or less since the beginning of their perception of the world. Tablets or other devices are already included in the equipment of some nursery schools, and it is common to see little freshmen with the latest smartphone models. Games and activities in the countryside or on the playground with peers have replaced digital games in the cyberspace. A very important aspect is the entertainment of life, which is also supported, for example, by the use of the Internet as well. In this context, N. Vrabec¹ very well defined the generation of digital natives as people who spend more and more time in the online world, bringing new friendships, preforming their hobbies, acquiring, sorting, and distributing information, communicate with a variety of channels, share their thoughts,

¹ Vrabec, N.: Digitální domorodci na Slovensku: komunikácia a nová identita mládeže v on-line prostredí. In: *Communication today*, 2010, 1, p.84

build their identity and participate in the lives of a narrower or wider community.

Since it is a new specific form of culture, cyber-culture determined by electronic media, it is obvious that even man, his thinking, perception and behaviour are subject to various changes under these influences. The Internet and the new media cannot deny their positive aspects and characteristics – speed and illimitability of communication, overcoming geographical, sometimes linguistic or other cultural obstacles in communication, general digitization in all areas of life, new forms of entertainment, ease of searching for the most up-to-date information, new possibilities for job opportunities and many other benefits.

However, beside many positive aspects of electronic media, especially the Internet we must not forget on their negative side. The ongoing digitization and work with technologies also causes some changes in the thinking of a person and the way of his cogitation or education. By letting digital technologies and the Internet control all areas of life, it can have fatal consequences for our personality. In addition to physiological negatives and health risks such as insomnia, depression, anxiety or overweight, our mind is at risk as well. We must also face a phenomenon such as cyber-stress or cyber-addiction. The unfavourable consequence of excessive use of electronic media in the area of thinking and education is the weakening of cognitive processes, namely memory, concentration ability, abstract thinking, or attention, reading and learning deficit disorders. The main objective of the contribution, therefore, is to define, through a theoretical reflection, these changes in thinking and education related to the impact of Internet communication and digital media. To achieve this goal qualitative methods of investigation were used, primarily a hermeneutic method which aims to understand and interpret texts, as well as analytic-synthetic and induction-deductive methods of research. In the following section of this study we describe the way in which these transformations take place and what specific changes the medium Internet is causing.

2 Information media and electronic communication

Although we regard information, knowledge and attainments as the basis and determinant of education, we must not forget that especially technologies, namely media we use, change and influence also our thinking and cognition. T. Zasepa and P. Olekšák² also point out in this context that the information media "have a significant influence on the human mentality and the way of thinking". Similarly, J. Bystřický³ argues that "with the gradual use of technology, we use a different way of thinking, not by changing the capabilities of our own dispositions, but by fundamentally changing their usage strategies." J. Lohisse⁴ considers the medium to be more of a tool or instrument, he even introduces a new logos and says that "it interferes with the way of thinking, directs imagination, underlie the understanding of the world".

Referring to changes in thinking, cognition, S. Gálik⁵ points out that new cognitive habits may have a different structural pattern, such as network layout, non-standard links between information, or interrupted information flow, especially with entertainment information. We can assume that each medium will form information in the consciousness as well as the cognitive processes of the mind in a specific way. In this context, J.

² Zasepa, T. – Olekšák, P.: *Internet a globalizácia. Antropologické aspekty*. Ružomberok: Katolícka univerzita v Ružomberku, 2006, p.14

³ Bystřický, J. et al.: *Médiá, komunikace a kultura*. Plzeň: Aleš Čeněk, 2008, p. 19

⁴ Lohisse, J.: *Komunikační systémy. Socioantropologický pohled*. Praha: Karolinum, 2003, p. 167

⁵ Gálik, S. et al.: *Vplyv kyberpriestoru na premeny súčasnej vzdelanosti*. Ložď: KSIEŽY MLYN, 2015, p. 17

Cejpek⁶ mentions three basic stages of communication development:

- a) a period of speech communication,
- b) a period of documented communication with the phase of the manuscript and printed text,
- c) a period of electronic communication.

Similarly, M. McLuhan (2011) divides human history into three stages – oral, phonetic, and electronic, with the decisive media being speech, phonetic writing, and electricity. However, in the context of the term "medium", we will understand the *communication medium* – that is, the form, means of communication of a certain historical stage. J. Lohisse (2003), in his publication *Communication systems*, describes four revolutionary communication media: speech, script, print, and the Internet, and each media epoch relates to several fundamental aspects: collective mentality (consciousness, category of time and space) and organization of society. By using and communicating over the Internet, our ideas about the space, time and organization of society collapse, for example in connection with the disintegration of the so-called linear code⁷. It is clear that the Internet is an electronic (technical) medium. By using different technologies (media), our perception changes, some senses are strengthened, others are, on the contrary, suppressed – their relationship is changing accordingly. The media theorist, M. McLuhan, describes this principle as a certain extension or auto-amputation of the physical body that causes these changes. As McLuhan⁸ says: *"technology does not act at the level of opinions or concepts, but constantly and without any resistance changes the mutual relation of individual senses and models of perception"*. In this context, we may also mention J. Šušola⁹, that refers to S. Harnad, who in 1991 already expressed the view that electronic communication represents another revolution in the history of human thinking and cognition. The essence of electronic communication has been poetically named as *electronic skywriting* and he in particular, considers its main benefit the fact that the element of interactivity in communication besides obstructing the distance barrier is being enriched. The Internet no longer has a solid background, such as a book, but it is characterized by spaciousness, capaciousness, plasticity, fluidity, which means that the texts can work in different ways, remove them or transform them again.

3 Transformations of thinking and education under the influence of the Internet

The Internet is a revolutionary medium that is completely different from its predecessors. S. Gálik¹⁰ says that the essence of the Internet lies in the non-linear, networking of communication technologies, with the idea of the "net" best describing the basis of new technologies that serve non-linear communication. In addition to the image of the network, the Internet is characterized and specified in particular by the dominance of visuality, visual culture and information of a visual nature. On this basis, we can define the Internet as *"a medium in which we can instantly and actively communicate information, particularly of iconic (pictorial) nature, via a multilaterally interconnected technology network."*

Based on the above, it is necessary to pay attention to the various changes that the Internet medium and communication through it brings to life of each of us. We identify with S. Gálik, who formulated three major changes in this regard, which we will try to approach in the following text. The basis for the processing are his collective monographs *Cyberspace as a New Existential Dimension of Man* (2014), *Influence of the Cyberspace on the*

Conversion of Contemporary Education (2015), and other contributions from proceedings related to the issue. Therefore, the individual changes and their context are presented as a synthesis and comparison of the mentioned sources.

1. Network arrangement of information. For this new type of communication, or the linking of information, we could use the notion of rhizomorphism, thus rhizomic thinking (rhizoma – the term from botany and represents the interwoven root system), which is relatively well captured in the philosophical – media discourses. Its authors are G. Deleuze and F. Guattari¹¹, who defined it in yet non-electronic era as follows: *"unlike trees or their roots, the rhizome joins any point with any other, while each of its signs do not refer to another signs of the same nature; it puts into play very different sign modes, and even non-sign states."* Well-known philosopher and theorist U. Eco¹² has similarly established this concept that distinguished it from the previous way of tree (arborescent) thinking. The image of the tree, for example, in medieval thinking (arbor porphyriana), represented the order of logical and hierarchical thinking – from the essence of the being to its marginal expressions. Eco even says that *"thinking means in the rhizoma to proceed on blind, and thus to be guided only by guesses."* In this context, we may also mention J. Šušola,¹³ that defines the communication and cognitive process based on rhizomorphism of knowledge as dynamic, interactive and highly individual. Referring to Burnett (1993) he also mentions four basic principles that characterize rhizomorphic structures:

- the principle of association and heterogeneity – any point of the rhizome may be linked to any other point; the structure is implemented on two levels – physical (telecommunications, hardware and software) and contextual (association ties – messages, their structure and interconnections). Link perception is initialized individually – connectivity is a democratization principle that functions as a structure of individualisation, because at any moment the "centre" of the rhizomorphic structure is the position of the individual in this structure;
- the principle of multiplicity – the number of access points (compared to the existence of one point) and multiple structures over a single structure are preferred. This also applies within "one" text – the reader constructs new texts by linking and annotating existing texts;
- the principle of a semantic break - the rhizomorphic structure (knowledge) does not stand on the hierarchy, that is, it cannot be influenced by the definition/addition of new relationships that were previously foreign to it, nor can it interfere with the new relationship;
- the principle of cartography and decalomania (pattern transfer) – the rhizomorphic structures are dynamic and interactive; they are constantly changing with each traveller's approach, as it is his position, which gives a view of the rhizomorphic structure at a given moment. The topology of these spaces requires other "maps" that constantly change with the movement of the traveller and with the current state of his understanding or misunderstanding of the problem (the influence of factors such as the cognitive context, state of mind, etc.).

Thus, we can state that rhizomic thinking is, unlike arborescent, non-systemic, incomplete, and networked, without beginning and ending. The Internet therefore, on the basis of its own technological and network – rhizomatic – structure directly supports the "bonding of unbondable". S. Gáliková-Tolnaiová¹⁴ adds that thinking when using the Internet is adapted to the nature of the information flow as in surfing in the network and acquires some particularities: fragmentarity, disconnection,

⁶ Cejpek, J.: *Informace, komunikace a myšlení*. Praha: Karolinum, 2005, p. 69

⁷ Gálik, S. – Lancošová, V.: Disintegration of "linear code" in communication on the internet. In *Psychology and psychiatry, sociology and healthcare, education: sociology and healthcare : conference proceedings, Volume 2*. Sofia : STEF92 Technology, 2014, p. 252

⁸ McLuhan, M.: *Jak porozumět médiím. Extenze člověka*. Praha: Mladá fronta, 2011, p. 32

⁹ Šušol, J.: *Sociálne a humánne kontexty elektronickej komunikácie*. Bratislava: Stimul, 2009, p. 13

¹⁰ Gálik, S. et al.: *Vplyv kyberpriestoru na premenu súčasnej vzdelanosti*. Loď: KSIĘZY MLYN, 2015, p. 19

¹¹ Deleuze, G. – Guattari, F.: *Tisíc plostín*. Praha: Herrmann a synové, 2010, p.30

¹² Eco, U.: *Od stromu k labyrintu. Historické studie o znaku a interpretaci*. Praha: Argo, 2012, p.60

¹³ Šušol, J.: *Sociálne a humánne kontexty elektronickej komunikácie*. Bratislava: Stimul, 2009, p. 18

¹⁴ Gáliková-Tolnaiová, S.: Postmoderná transformácia edukácie a vzdelanosti v kontexte kyberpriestoru. In: Gálik, S. et al.: *Vplyv kyberpriestoru na premenu súčasnej vzdelanosti*. Loď: KSIĘZY MLYN, 2015, p. 34

superficiality, shortness. Similarly, P. Virilio¹⁵ states in his publication *Aesthetics of Disappearance* that our consciousness and thinking determine technology, which makes our perception and thinking become discontinuous, picnoleptical. The Internet therefore does not support the abstract, linear and logical thinking on which European education was founded. Therefore it is possible to talk about so-called "breakdown of the linear code", which was one of the basic forming principle of medieval but especially modern age European culture, with which, for example, it is related to the notion of linear time. There are no physical support points in Internet communication that allow time counting. The high speed of communication creates a sense of permanent presence; time is instantaneous, current, simultaneous. Strengthening the present may, however, lead to the rejection of the past (and of the future), thus traditions, religion, national pride etc. This is supported, for example, by M. Bauerlein's research, who has studied the education of American youth. He came to the conclusion that the knowledge that had some relevance to the past fell – it poses a risk for further positive development of society and education, wisdom.

American writer N. Carr¹⁶, who has been dealing in the long term with the relationship and interdependence of thinking, technology and culture, draws attention to a research study from 2008, aimed at the impact of the Internet on a young population, attended by approximately 6,000 members of so-called "Internet generation". The author refers to D. Tapscott, who, in connection with the study's findings, stated that immersion in the digital world influenced the way young people absorb information. It is not necessary to read pages from left to right and from top down, instead it is possible to skip texts, quickly scan them and search for information that interests them. Carr also refers to media theorist M. McLuhan and his predictions and says that we have found ourselves at the crossroads of our intellectual and cultural history, at the moment of transition between two very different ways of thinking. For the wealth that the Internet provides us, we deal with what is referred to as "old linear thinking" in scientific discourse. Our peaceful, uninterrupted and concentrated linear thinking is by the action of the Internet embossed by new thinking that wants and needs to grasp and sort information into short, incoherent and often overlapping – the faster, the better. Many users feel they are becoming more intelligent at such times. These feelings are, however, so intoxicating that they can draw our attention away from the deeper cognitive effects of the Internet.

2. Communication in the cyberspace is approaching the speed of light; it is almost instantaneous and therefore has a dromotropic character. However, the high speed of communication creates a sense of permanent presence, immediateness, because the "empty" time intervals, during which we wait for further information, disappear. This type of communication also contributes to the decomposition of the concept of temporal, linear sequence. Geometric growth and expansion of information in combination with speed will, however, cause problems in their time processing, which may lead to some inaccuracies, simplifications or information noise. S. Gáliková-Tolnaiová¹⁷ also refers in this context to the "information overpressure", or "information overload, repletion" – a problem related to the surplus of information. Information repletion can thus result in digital nihilism. Similarly, M. Haršanyiová¹⁸ also points out and states that especially rhizomatic features of the electronic environment allow not only an unsustainable increase in information in a variety of forms (sounds, movements, linguistic expressions with semantic content), but also relations and interconnections between them. However, new information is often generated only by repeated or minor change of primary

information. It is constantly repeated and has endless use – that way, it produces, processes and stores much more information than humanity can absorb. Information overload can be manifested by:

- demotivation, lack of perspective in the information environment and communication processes,
- cognitive and informational stress, techno-stress (fears and stressful feelings associated with managing new technologies),
- information fatigue syndrome (tension, anxiety, frustration, nervousness, anger and confusion)
- tolerance of errors, ignoring information and reducing professional satisfaction,
- inability to use information satisfactorily and efficiently.

It is therefore clear that stated factors do not contribute to improving the current education and scholarship.

3. The weakening of the ability of abstract thinking determined by the dominance of images on the Internet. Thinking in a cyberspace is influenced by constant discontinuity of images, short texts, etc., which does not support concentration and continuous development of ideas. Conversely, texts in newspapers or books require concentration and monitoring of logical continuity. It follows that books and texts are rather supportive of abstract and logically continuous thinking, unlike television or the Internet where the dominant thinking is figurative, discontinuous. We no longer have to speculate about the images, but their meaning is presented to us in complex entities, and consequently we can only consume them sensually and mentally. In this context, S. Gálik refers to G. Sartori, who believes that visual media change our thinking, imagination and knowledge. He even talks about the new human anthropogenesis, its transition from *homo sapiens* to *homo videns*. "*Homo videns is a person who rejects difficult rational approaches such as abstraction and logical argumentation, but rather emphasizes images, emotions and entertainment.*" Image dominance on the Internet supports entertaining, multitasking and academic procrastination, which we can ultimately indicate as the decline of culture and education.

We also agree with the opinion of S. Greenfield¹⁹, who claims that if the human brain, whom evolution literally commands to adapt to its surroundings, we place it in an environment where there is no apparent linear sequence, where everything can be reversed, where the time response between action and reaction is minimal, then the flow of ideas may be disturbed. Adding to this the fact that our senses are constantly scattered by various attractive audiovisual stimuli, resulting in a shorter focus – we can become a computer by ourselves: a system that is capable of responding efficiently and processing the information well, but it is not capable of deep and contemplative thinking.

S. Gálik²⁰ also accentuates that the individual aspects are very closely interconnected and linked. Internet contents have an iconic look; they change very quickly and connect in the most diverse, networked way. Current education is changing under their influence, from a discursive linking of information that is based on a linear approach to associative, to network thinking, and consequently education. Associative linking of information may be more creative, but on the other hand, it significantly weakens logical and abstract perception and thinking. Following S. Gálik, it can be underlined that education, and in particular its part in the form of scientific thinking and knowledge, requires thinking that is based on a linear sequence of information. If an associative type of thinking began to dominate in current culture as a result of the development of cyber-culture or the use of the Internet, it could pose a risk to today's society and education, which, on the contrary, are based on linear discourse thinking.

¹⁵ Virilio, P.: *Estetika mizení*. Červený Kostelec: Pavel Mervart, 2010, p. 71

¹⁶ Carr, N.: *Nebezpečná mčelína: Jak internet mění náš mozek. Analýza stavu lidské psychiky v době digitální*. Praha: Dauphin, 2017, p. 19

¹⁷ Gáliková-Tolnaiová, S.: Postmoderná transformácia edukácie a vzdelanosti v kontexte kyberpriestoru. In: Gálik, S. et al.: *Vplyv kyberpriestoru na premeny súčasnej vzdelanosti*. Loď: KSIEŽY MLYN, 2015, p. 28

¹⁸ Haršanyiová, M.: Informačné preťaženie v sieťovej komunikácii. In: Magál S., Petranová D., Solík M.: *Megatrendy a médiá – Nové diskurzy mediálnych štúdií*. Trnava: Fakulta masmediálnej komunikácie UCM v Trnave, 2011, p. 101-102

¹⁹ Greenfield, S.: *Změna myšlení. Jak se mění naše mozky pod vlivem digitálních technologií*. Brno: Albatros Media, 2016, p. 31

²⁰ Gálik, S. et al.: *Vplyv kyberpriestoru na premeny súčasnej vzdelanosti*. Loď: KSIEŽY MLYN, 2015, p. 21

In terms of standard education, these changes and tendencies are rather negative. Many authors, therefore, draw attention to the further negative consequences of these changes. One of them is also the German psychiatrist Manfred Spitzer, who in his works explores the impact of digital media and technologies on the learning, thinking and health of man and society. In one of his publications (2014) he claims that digital media deprives us of the need to perform mental activity. Everything we previously performed and realized simply through mind or memory now provides computers, smartphones, organizers or navigations. He emphasizes that this situation is very dangerous for both society and individuals. In digital media, we become addicted and, in the long run, they are detrimental to our body and, above all, our minds. As soon as we cease to develop mental activity and effort, our memory and attention is weakening and dull. Nervous connections die due to inactivity, and the new ones do not survive because they are not needed. M. Spitzer, on the basis of his research, also shows the concerns that this development evokes and encourages to limit the consumer's way of life, especially in children, to prevent "digital dementia". Spitzer²¹, among other phenomena, also focuses on multitasking. He states our life in the "digital age" is characterized by the fact that we constantly do many things at the same time. Ultimately, however, it is solely about *media multitasking*: we search for information on the computer, listen to music, write e-mails or other text messages on the smartphone, all while actually we are reading an article. In the background, we can often hear a TV, while another phone rings... The author thus asks what kind of expressions such media treatment will leave in us. Does the multimedia environment make us smarter? He stresses that we cannot be indifferent to what we are experiencing because "every mental activity leaves a trace in a brain that affects his future functioning." Spitzer compares multitasking to the psychological notion of *cognitive control*. He claims that already in early childhood we learn to control our thoughts, for example by suppressing irrelevant things and focusing on specific tasks. This ability is given to the human brain, it is simultaneously taught, and each individual has more or less of it. He illustrates it on the example of our ability to speak – speech centres are also genetically determined, but to be able to function, they need to be activated. It succeeds – more or less – which also creates differences in coping with the language in spoken or written form. Thus, if the cognitive control is taught, and if the way in which thoughts and thinking are controlled by immersing themselves in the world of multimedia change, then multitasking should also influence the ability of our mind control. It can be positive – a person is improving through lots of tasks, but also a negative one, because if we constantly do many things at the same time, it can lead to superficiality or discontent. However, according to Spitzer's research, it is clear that intensive multitasking does not train our attention; on the contrary, we are increasingly distracting it. In the context of multitasking and distraction, Spitzer²² states very simply: "...no one reads two books at the same time to read them both faster." It is clear that media leisure multitasking is very widespread in the youth. However, when we proceed in learning or working, it becomes ineffective, which verified several baseline researches in experimental psychology. Whoever performs multitasking daily or seeks for this mode of operation, will ultimately not be better at it, he even "trains attention deficit disorders". Spitzer therefore recommends that we do not lead especially future generations to multitasking, and do not support them in it.

In this context Spitzer's latest 2016 publication called *Cyber-sickness!* is also noteworthy. The author describes that by the constant use of digital media and technologies we become sick – "cyber-sick". He describes various consequences of excessive work with them, such as various forms of cyber-phobia, cyber-addiction or cyberchondria – the fear and anxiety related to the disease that a patient creates when using search engines and "google" information or signs of his illness. One of the other negatives is cyber-stress. Many people consider stress as

everyday part of a life. But what exactly is stress? According to Spitzer, it is an insufficient control. According to the author, stress is not caused by unpleasant experiences of itself, but rather the feeling that we are helplessly delivered to them. As long as we know that we cannot influence the situation, it causes stress in us – we are stressed every time we lose control. For the best recipe against stress, Spitzer considers self-reliance. A modern person suffers from loneliness, anxiety and stress as a result of digitized life. The emergence of digital and information and communication technologies in all areas of life, however, many people experience as a strong loss of self-esteem – they feel a fundamental loss of control. Whether it is stress in connection with smartphones, social networks or the risks of electronic communication, we can feel that we do not know the technique that we do not control it. "Digital information technologies are causing us stress, precisely by now being penetrated into all areas of life in all sorts of ways, by controlling us." ²³ This is accompanied by a constant fear that we will miss something, the fear of loss of "friendly" contacts on the networks or the loss of the device that allows us such contacts... Acute stress can save lives, chronic stress, where we can include cyber-stress (techno-stress), on the contrary, kills us.

Conclusion

We can state that one of the basic socio-cultural or anthropological characteristics of man is that he can adapt to the environment in which he lives. Our ancestors have always had to adapt to a changing world in which new inventions or technologies further determine their lifestyle, priorities, taste or thinking and understanding of the world. Why would it be in the "digital age" differently? Thus if the human brain, which literally evolution commands to adapt to its environment, we place it in an environment in which there is no linear sequence, where everything can be reversed, where the time difference between action and reaction is minimal, and especially where the time is generally perceived deficient, then the flow of thought and thinking itself can be disturbed. We agree with S. Greenfield²⁴ that if we add the fact that our senses are constantly dispersed by an incredible amount of audiovisual stimuli, the result of which is a shorter time of focus, we can become a kind of "computer": a system that is capable of responding efficiently and processing information well, but is not able to think deeply, contextually and logically, which poses a major risk for further development and direction of education.

The tax on the use of intellectual technology can be quite high. Individual tools of thinking alternately expand but also blunt our most intimate, most human and natural abilities – mind, perceptions, memory and emotions. At the same time, the process of learning and education itself is transformed. Based on multiple studies, it is confirmed that learning ability can be severely restricted when our brain is overloaded with various online stimuli. N. Carr²⁵ states in this context: "More information may mean less knowledge." The author also refers to John Calkin, a Jesuit monk and media expert, who in 1967 said: "We form our instruments and then they form us." In our contribution, we have repeatedly suggested that cybernetic clustering or blurring of boundaries between human mind and machines (technologies) allows us to perform certain cognitive tasks much faster. At the same time, however, it poses a threat to the integrity of our human being. Carr also states that the digital systems that our brain so willingly knows give us their power, but at the same time they put our limitations on us. Based on this, we can observe a certain parallel with Calkin's statement and, in partial adjustment, we can state: we program computers and they then program us.

It is, of course, naive to think that technological progress and the associated innovations in different areas can be stopped. Our

²³ Spitzer, M.: *Kybernemec!* Brno: Host, 2016, p.142

²⁴ Greenfield, S.: *Změna myšlení. Jak se mění naše mozky pod vlivem digitálních technologií.* Brno: Albatros Media, 2016, p. 31

²⁵ Carr, N.: *Nebezpečná měřička: Jak internet mění náš mozek. Analýza stavu lidské psychiky v době digitální.* Praha: Dauphin, 2017, p. 294

²¹ Spitzer, M.: *Digitální demence. Jak připravujeme sami sebe a naše děti o rozum.* Brno: Host, 2014, p. 204

²² Spitzer, M.: *Kybernemec!* Brno: Host, 2016, p.54

thinking will need to be adapted to new technologies with which education and learning process will also change. As described by N. Carr²⁶, the five centuries since Gutenberg's book publishing, which made reading popular, linear – and also literary – thinking was the centrepiece of art, science and society. Flexible and yet fine linear thinking was imaginative thinking in the Renaissance period, the rational thinking of enlightenment, the inventive thinking associated with the industrial revolution, and even the disruptive thinking of modernism. Maybe, however, it will soon be thinking of past days.

In conclusion, therefore, we agree with S. Gálik²⁷ that it will be extremely important for the future form of European education to what extent original approaches to education (reading habits, the ability to interpret text, logically and abstractly develop ideas) will be maintained. It can be said that the Internet is becoming an epicentre of change, the extent and depth of which cannot be reduced to technological progress. It ceased to be a victor and became the cause of a fundamental social break. We therefore consider that the Internet and new media are the engine of the new paradigm of human education, thinking and perception of the world.

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Primary Paper Section: A

Secondary Paper Section: AJ, AM, AN

²⁶ Carr, N.: *Nebezpečná mčičina: Jak internet mění náš mozek. Analýza stavu lidské psychiky v době digitální*. Praha: Dauphin, 2017, p.20

²⁷ Gálik, S. et al.: *Vplyv kyberpriestoru na premeny súčasnej vzdelanosti*. Łódź: KSIEŻY MŁYN, 2015, p.23

ADAPTATION OF A NOVICE TEACHER IN PRIMARY EDUCATION

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Abstract: This report of theoretical-empirical character deals with the theoretical analysis of the problem of professional adaptation of the novice teacher of primary education. Attention is paid to the overview of international projects and to the results of foreign research dealing with the issue of the adaptation period. Qualitatively focused research aimed at identifying how the initial adaptation phase of a primary school teacher is going on is part of this report. The method of direct unstructured observation and the method of individual semi-structured interview was used to collect qualitative data. The data obtained was analyzed by an open coding technique. In the portion where we interpret the results, we present a complete summary of the research findings that may be the basis for further pedagogical research in the field of professional adaptation of beginning teachers of primary school education.

Keywords: professional adaptation, novice teacher, induction teacher, primary education, qualitative research

1 Introduction

The first years of the teacher's pedagogical practice bring with them certain unexpected situations or problems that have been presented to the novice teacher so far only at the theoretical level. A novice teacher should overcome various difficulties of an objective and subjective nature that do not occur in other professions. The period of professional adaptation of a primary education teacher involves not only the process of adaptation education but also several other new activities and responsibilities in relation to pupils, parents and teachers. Professional adaptation represents a challenging phase of the teacher's career, which needs to be given sufficient attention, since the seamless adaptation of the novice teacher can be a prerequisite for the functioning of the school as a whole (Pol, Lazarová, 1997). The phase of the teacher's career is of the utmost importance since the acquired experience during the adaptation period plays an important role for the teacher's professional development in the context of continuous education.

2 Professional adaptation

The general meaning of the term "adaptation" includes the process of getting used to something. This term can be defined in several ways (biological, medical, sociological, psychological). Given the nature of the report, we will focus on the pedagogical aspect. We call the first years of the teaching profession a professional adaptation, during which teachers acquire the first real experience and practical skills in pedagogical practice. In the context of the teacher's career, this is the second phase and, according to several authors (Kasáčová, Kosová, Pavlov, Šimoník), dealing with the issue of professional development of teachers is considered the most important stage since the experience gained during this period plays an important role for the further development of their professional career. Beginners are at this stage ready to learn, create and change educational and training processes. They have high demands not only for themselves but also for the system itself. However, the adaptation of a novice teacher depends on various factors. One is the degree of adaptability of a novice teacher. Upon entering the teaching profession, a new teacher is expected to adapt quickly, adapting to the new environment and managing all the demands placed on them since the first day. However, the novice teacher might not reach this stage of adaptation for various reasons. There might be misunderstandings with colleagues, disagreements with the mentoring teacher or school principal or non-alignment with the standards and culture of the school. It is therefore important during the adaptation to create a suitable environment and favorable conditions for teachers. Teacher Education Methodology in Europe ETUCE (2008) defines the specific conditions for the adaptation phase, including support from introducing teachers and other colleagues, a reduced lesson plan without lowering rewards, access to adequate sources of

support, mandatory participation in the adaptation program, and the opportunity to introduce a systematic theoretical approach into practice. If the novice teacher's work conditions are inadequate (e.g. school equipment, barriers in communication with colleagues or the school principal), the novice teacher is unable to fully develop their potential, won't be able to apply innovative teaching methods which would make the educational process more effective. As a result, there may be a variety of problem situations or even the teacher's resignation.

3 Adaptive Learning

Part of the period of professional adaptation is adaptive education which, according to Vincejová (2014), facilitates the period of professional start-up and allows the novice teacher to acquire the professional competences necessary for the performance of independent pedagogical activity that cannot be obtained during undergraduate training. The history of adaptive education in Slovakia dates to 1976. It was officially introduced in 1977. The concept of a uniform system of teacher education was developed, where its first stage was the introduction of mentor teachers into practice. Six exemplary introductory programs for teachers of kindergartens, elementary schools, gymnasium teachers, secondary vocational schools and secondary vocational schools as well as educators were created. A methodological manual was developed for these documents. The training program introduces the issue of introducing a functional study for senior pedagogical staff and a specialization study for methodologists. Formal methodical support was issued in 1986. By 1989, each newly qualified teacher had to have their mentoring teacher. However, the inclusion of a novice teacher into the school environment was not legally anchored. Since 2009, the establishment of the novice teacher has become formal in character and the program of adaptive education has become anchored by legislation (Kolláriková, 2016). Adaptive education is currently underway in Slovakia through appropriate adaptation programs that contribute to improving the quality and number of teachers. The law on adaptive education in Slovakia includes Act No. 317/2009 on Pedagogical and Professional Employees, Directive of the Ministry of Education, Youth and Sports of the Slovak Republic no. 19/2009-R, which publishes the "Framework Program of Adaptation Education" and Decree of the Ministry of Education, Youth and Sports of the Slovak Republic no. 445/2009 on continuing education, credits and attestations of pedagogical staff. According to the above-mentioned regulations, pedagogical employees who enter the pedagogical workforce for the first time are obliged to undergo adaptation training, which is carried out under the guidance of a senior professional. In Slovakia, it is necessary to complete adaptation training no later than two years from the beginning of the teacher's employment in education. The adaptation period may last for at least three months, but adaptation training is usually done over a one-year period. The school head determines the way and form of how the training is finished. A final interview or an open hour is held before a three-member examination board appointed by the school head, to which he is also the chairman of. The commission must also contain the mentor teacher who will prepare the final report. Upon completion of the adaptation training, a protocol is drawn up, which must be signed by all the members of the Examining Board and the beginning Teacher. A decision on successful or unsuccessful adaptation training is issued by the school head 15 days after signing the protocol. After successfully completing the adaptation training, the novice teacher becomes an individual pedagogical employee and is granted a higher pay grade. However, if a novice teacher fails to successfully complete the adaptation training, they may within 15 days ask the school head for a correction deadline for completing adaptation training. If the beginning teacher is again unsuccessful, the school head must terminate the employment with the novice teacher according to the Labor Code.

Within Europe, adaptation programs are diverse and support for

novice teachers varies from country to country, whether through the length of adaptation education, its nature, or organization. From the point of view of lifelong learning abroad, graduates do not end their education after getting their diploma. By completing their studies at pedagogical faculties, they will acquire a "starting qualification" of a teacher who needs further development and are given a teacher's qualification status, but a license for a full-fledged teacher profession capabilities will be given after one or two years. In some countries, the adaptation is targeted at those teachers who have completed the initial training, obtained the appropriate qualification and permission to teach. In other European countries, adaptive education is targeted at teachers who have obtained the required qualification, but lack the necessary license to teach. In this case, the adaptation phase ends with a formal assessment of the so-called "Trainees" and their decision to enter the teaching profession. Although the adaptation programs are different in each state, they combine several characteristics. First, its complexity, which means that adaptation programs should be structured, comprehensive, thoroughly monitored and have clearly defined roles for all the senior staff. Another common feature of adaptation programs is the focus on vocational education, the growth and professionalism of teachers. An essential element of adaptation programs is cooperation as part of a culture of learning in which novice and mentoring teachers share their views, experiences, or practices (ETUCE, 2008).

4 Overview of foreign research

The issues of novice teachers and their early years of work in the school environment is addressed by several major projects and researches in an international context. An international project entitled "INNOTE: Induction for Novice Teachers", involving the Netherlands, Germany, England, Hungary, Czech Republic, Finland, Estonia and Slovakia, was implemented in the years 2009 to 2012. It is a collaboration of 13 institutions, namely the University of Groningen, the Charles University in Prague, the Grammar School of Jiří Gutha-Jarkovský, Joensuu Lyseon Peruskoulu, the University of Regensburg, St. Mariengymnasium Regensburg, Dr. Nassau College, University of Edinburgh, Esterházy Károly Főiskola, University of Tartu, Comenius University in Bratislava and Primary School of Dr. Milan Hodža. The project was aimed at integrating lower and higher novice secondary school teachers into the school environment. The purpose of the project was to acquire knowledge on the establishment of novice teachers in this environment, and based on these findings develop a comprehensive training program aimed at supporting and assisting beginner teachers in the European Union.

The Comenius 2.1 project titled "TISSNTE" (*Teacher Induction: Supporting the Supporters of Novice Teachers in Europe*) covered the situation of training novice teachers and educating mentor teachers in 12 European Countries (England, Belgium, Bulgaria, Greece, Ireland, Lithuania, Latvia, Hungary, Portugal, Austria, Slovakia, Turkey). The results of the project point to the fact that additional high-quality education and professional teacher support are the main factors contributing to the recruitment and retention of novice teachers in schools, the improvement of teaching standards and learning outcomes. As many young teachers leave schools (less than 50% of starting teachers in England remain in education after 5 years), mentor teachers play a key role in training and supporting novice teachers. However, the needs of the teaching staff remain unanswered. The support system for mentoring teachers within Europe is fragmentary and there is no transfer of examples of good practice, even though a European Framework of Teacher Competencies has been created. The TISSNTE Teacher Training Program is anchored in a European context and has provided mentor teachers with opportunities for mutual collaborative learning and professional development, as well as the ability to constructively generate knowledge based on different views by teachers on the practice of introducing novice teachers. The essence of the TISSNTE project is to conceptualize the introduction of novice teacher training to create learning communities within institutions, cultural and national borders,

thus contributing to a better understanding and improvement of professional practice within the European context (Gadušová, 2008).

Interesting findings have been found in the research carried out at the Faculty of Education of Charles University, which is described by Kosová (2015) in her publication. Research was focused on the assessment of undergraduate training and the reflection of the problems of the teaching profession. It was found that there is a conflict between pre-university education and the needs of current educational system. Respondents in research (graduates and directors) agreed that the theoretical training is outside of the teacher's profession. It turned out that union didactics are overly focused on theoretical knowledge. Novice teachers in this research have argued that for a successful career start, much more practical preparation is needed in the form of pedagogical practices and training aimed at acquiring the necessary pedagogical, didactic and personality skills. The findings also included a reflections of novice teachers by school leaders who positively assessed the theoretical training of novice teachers, a wealth of knowledge, creativity, enthusiasm, computer work, and the introduction of innovative trends in the education and learning process. The directors stated that novice teachers were properly self-confident. On the other hand, the directors criticized novice teachers for not managing administrative activity and conducting pedagogical documentation. Criticism also included the lack of legislative control. Beginning teachers did not know what the rights and duties of a teaching staff were, the law of education and binding pedagogical documents. As further deficiencies, the school principals have stated the lack of readiness to communicate with pupils, the inappropriate behavior towards the pupils' parents, the inability to solve the educational offenses, the inability to explain the student's curriculum and the lack of precision for the work of the class teacher. However, if we look at the situation from the point of view of beginning teachers, studies dealing with the issue of graduates of faculties of education and subsequent beginners point to factors that cause frustration and thus affect the personality of the novice teacher. This is mainly about the overload that the beginning teachers associated with the management of administrative activity. Other frustrating factors include the large number of pupils in the classroom, the fear and uncertainty surrounding the pupil's admission, the increased pupil aggression, objective assessment and the loss of motivation. We can say that teachers perceive the didactics of their subject separately from activities such as keeping pupils' attention or maintaining discipline in the classroom. This suggests that didactics of teaching subjects, other pedagogical disciplines, and psychology have been so isolated during their undergraduate training that teachers do not see a direct link between them. However, it should be emphasized that the teacher's work does not depend only on undergraduate training at college. Significant factors involved in shaping a teacher's pathway are personality traits, motivation for the profession, intelligence, health, or working conditions of the teacher.

Another interesting research was conducted by Bendl (1997) in 1996 at twenty primary schools in the Czech Republic. Its aim was to find out which activities the teachers are tackling without complications and which, on the other hand, are causing problems. The questionnaire method was used to collect the data. Teachers were provided with 26 pedagogical activities, with respondents choosing from two choices: "I have problems" or "I do not have problems". The questionnaire included activities such as selecting material for the lesson, scheduling the curriculum for the whole school year, scheduling the lesson, communicating with pupils, motivating pupils, explaining the new curriculum, retaining the pupils' attention, adapting the teaching to the pupils' age, applying the individual approach, the use of frontal teachings, the maintenance of individual assignments during teaching, the work with above-average pupils, the work with students which are not prospering, the work with average pupils, the assessment and classification of pupils, the resolution of offenses, the cooperation with colleagues, the response to pupils' choice of educational methods, fulfillment of educational duties, fulfillment of

educational duties, formulation of tasks, consulting with parents of pupils. However, the author states that the results of the research carried out should be assessed with great caution as it is difficult to evaluate how teachers are able to objectively evaluate their own pedagogical activity. Another reason for judicious interpretation of the data is the fact that the research was attended by experienced teachers as well as novice teachers who are still learning their "pedagogical craft". The results show that teachers did not have any problems in responding to pupils' questions, pre-class and role-playing, the choice of teaching methods, and working with colleagues. On the contrary, pedagogical activities such as maintaining discipline during teaching, dealing with offenses, motivating pupils, keeping pupils' attention, applying individual approach, working with unscrupulous pupils, assessing and classifying pupils have proven to be very problematic. If we want to categorize individual activities, social activities are more problematic than the didactic ones. The reason for this may be the fact that the didactic or cognitive side differs from the social side of view at teachers' faculties.

The difficulty of individual pedagogical activities evokes the reflection on the causes of deficiencies in the work of novice teachers. The source of the problems may be the underestimation of the teaching profession by the public, unsuccessful school reforms, or the preparation of teachers for their pedagogical career at faculties of pedagogy. There are no seminars, lectures or workshops on pedagogical faculties aimed at acquiring knowledge about practical activities, for example, on the treatment of educational offenses, pedagogical diagnosis of pupils, work with non-prospering pupils or on motivating and retaining the attention of pupils. Even during admissions, talented future teachers should be exposed, for example, through a talent test.

The results of the research on the adaptation of novice teachers (Průcha, 2009) point to the causes of the problems of beginning teachers. These are causes stemming from the teacher's personality, where beginning teachers find out they are not sufficiently mentally prepared to pursue a teaching profession. They do not have the problem of preparing for or implementing their knowledge, but these problems make it hard for them to retain classroom discipline, taking full responsibility for pupils, make it difficult to communicate properly with pupils and their parents or colleagues. Beginning teachers thus experience excessive psychological stress and pressure. Other causes of problems of beginning teachers are associated with the professional competencies of teachers. Young teachers find out that the undergraduate study has not sufficiently prepared them to perform some pedagogical activities such as conducting pedagogical documentation or communicating with parents. Other causes arise from situations that happen in schools and for which teachers have not been prepared because they do not have enough practical experience. However, this experience will only be gained during the next few years of their pedagogical practice.

5 Research Methodology

In this part of the paper we present the methodology of qualitative research. We present the research problem and the research goal, the research questions and the used research methods, characterize the research sample and define ethical standards that we have been upholding in the research. Based on the analysis of the obtained data, we bring together the findings regarding the course of professional adaptation of the novice teacher of primary education.

5.1 Research Problem and Research Objective

Within the subject of this report, we identified the following research problems:

- RP_1. Experience of beginning teachers of primary education during professional adaptation.
- RP_2. The co-operation of the novice and mentor teacher during the period of professional adaptation.

The following empirical objectives are a result of these research problems:

- Analyze the process of adaptation of the novice teacher of primary education, with emphasis on current research findings, including adaptive education;
- identify specific pedagogical activities that are problematic for a beginner primary school teacher;
- identify specific pedagogical activities that are seamless for a beginner primary school teacher;
- examine the elements of co-operation of the novice and mentor teachers.

As part of the analysis of the adaptation process, we were interested in the adaptive education of novice teachers at elementary school, with emphasis not only on the positive experiences of beginning teachers but also the problems that have arisen during this period. Using research, we wanted to find out what pedagogical activities are most challenging for novice teachers and which, on the other hand, are seamless. We were also interested in the quality and form of cooperation between the novice and the mentor teachers.

5.2 Research questions

The above-mentioned research objectives determine the formulation of research questions. As part of finding a solution for the research problems, we will look for answers to the following questions:

- What are the experiences of beginning teachers from the period of professional adaptation?
- Which pedagogical activities are problematic for novice primary school teachers?
- Which pedagogical activities are seamless for the novice teachers of primary education?
- What is the form of co-operation between the novice and the mentor teacher of primary education during the period of professional adaptation?
- What is the degree of conformity of the adaptive education with legislation?

5.3 Methods of research

Since research has been qualitatively oriented, we have used several research methods to collect our data. In the qualitative part, we used the method of individual semi-structured interviewing and the method of direct unstructured observation for data collection. We used a direct unstructured observation method to collect qualitative data. As described by J. Hendl (2005), this is a method that captures the largest possible range of situations in each group, in our case the class. According to Švaříček (et al., 2007), this is one of the most demanding methods of data collection in qualitative research. Unstructured observation does not use predetermined observation systems, scales, or other tools, so the studied reality is not pre-structured (Gavora, 2007). The author claims that this way of collecting data is flexible, revealing new, unexpected and hidden phenomena or contexts. Using the observation method, we have tried to understand the whole context in which the adaptation of the novice teacher takes place, since it is important to understand the problem across its breadth. As it was a direct observation, we were present directly in the studied field - school class. We observed three elementary teachers in the first grade of primary school in a range of 50 lessons, with two teachers being observed for over 40 lessons and one teacher for 10 lessons. The lessons were recorded using audio technique (dictation) to obtain audio material (together 37 hours 30 minutes). During the observation, we focused on teachers' skills, pedagogical communication, and we also observed pupils' discipline during the teaching. Observation was conducted on subjects according to the current timetable. These were the subjects of Slovak language and literature, mathematics, natural sciences, national education, English language and literature, art education and music education. The observation was carried out between October and December 2016. This method was used to capture

situations which the participants rarely talk about in conversations, thus granting us our own opinion and insight into the issue of a novice teacher's adaptation.

We also used the method of individual semi-structured interviews to collect qualitative data. As part of the data collection, three interviews with novice primary teachers were conducted. Each interview was semi-structured with predefined thematic subjects, with the order of thematic subjects changing and adjusting to the situation. This type of interview, according to Reichl (2009) and Hendl (2005), can be described as an interview with instructions. The way the questions were answered was made to remain open, where the teacher could choose the style of their answer. The semi-structured interview is characterized by greater flexibility, making it a more flexible research tool compared to other types of interviews. This type of interview is recommended to use just when working with a target group such as teachers, because it is not easy to motivate participants due to the lack of time in the teacher's work when working with this group. In the creation of thematic subjects of semi-structured interviews, we relied on the results of the observations. The thematic focus of the interviews was conceived in the following areas:

- problematic and problem-free pedagogical activities of novice teachers;
- the process of adaptation education for novice teachers;
- cooperation between the novice and the mentor teacher;

Using this method, we gained information on the process of adaptation education (the extent of conformity between legislation and reality), we focused more deeply on the specific problems of beginning primary school teachers, but also on the positive experiences of novice teachers during the adaptation period, and we found out how cooperation between beginner and mentoring teachers works during professional adaptation.

5.4 Research sample

The choice of our sample was made by a deliberate qualified selection, defined by Maňák and Švec (2004) as a selection that has certain features important for research. One of the features was to meet the criterion of the time limit for the adaptation period of the beginning teacher, and a maximum of 2 years of pedagogical activity at the first level of elementary school. The subjects of the research were 3 teachers of primary education with less than 2 years of teaching experience. In the report, to maintain anonymity, we do not mention the real names of the participants or the names of the elementary schools.

5.5 Ethical principles of research

As our research has been qualitatively oriented, it was necessary during its course to place emphasis on ethical principles in its implementation. According to Gavora (2006), these are much more important in research of qualitative character than in quantitative research, since in the qualitative research a close contact between the researcher and the investigated persons is held. Ethics in research represent decency; it is therefore necessary for the researcher to be honest not only during the research but also after it is finished. As stated by Miovský (2006), ethical rules are based on three basics. They address the impact of the researcher on the research field, the protection of participants and the protection of the researcher. During the research, we followed the following ethical principles:

- Acknowledgment of participation in the research - the teachers who participated in our research were acquainted with the purpose of the research and its course. Teacher participation was voluntary, with the possibility to end their participation in research at any time;
- the credibility of the researcher - it was very important for us to gain the trust of the teachers. It was not just about increasing motivation to participate in research, but we tried to make sure that teachers provided us with sufficiently

valid and accurate information regarding the adaptation of novice teachers at elementary school;

- empathic neutrality - our participants showed interest and understanding during the interviews and, as recommended by Miovský (2006), we were neutral to the findings and tried to avoid any evaluation or assessment;
- freedom of dismissal - Teachers have been informed that they have the opportunity to not answer all the questions they have been asked;
- anonymity - the true names of teachers are of course known to us; however, their identity has remained confidential. This ethical principle is to maintain the credibility of the information and to protect the personal data of the participants. Teachers were informed in advance of who and for what purpose would have access to the gathered information;
- non-harm - our intention was in no way to induce pressure, to manipulate with teachers and we wish to avoid any inappropriate comments on the teacher's personality. We also did not impart our attitudes, opinions or values to teachers, but we respected participants as our partners and co-authors of research;
- correct data processing - our intention was to record, analyze and interpret the research data correctly. Teachers can contact us in case of questions or any other confusion (Gavora, 2006).

5.6 Analysis of obtained data

We used an open coding technique to process and evaluate the qualitative data obtained from interviews and observations. We relied on the procedure described by Švaříček (et al., 2007) in his methodological publication. We divided the text into units that were words, sentences, or paragraphs. The individual rows of the text were first numbered, and each code was assigned to each unit. When choosing a code, we asked questions about what the text says or what topic it represents. We have grouped dozens of codes based on a similarity or other internal context, thus gaining a hierarchical system. We have re-coded and renamed the individual codes to create a list of existing codes. Subsequently we proceed to systematic categorization. We have chosen the category titles in a way recommended by Strauss and Corbin (1999). Our aim was to name the categories as logically as possible with the data they represent. The analysis of qualitative data resulted in the creation of meaningful categories closely related to the adaptation process of the novice teacher of primary education (Tab. 1).

Tab. 1: Categorized list of codes

CATEGORIES	CODES
Positive experience from the period of professional adaptation	Acceptance from students Acceptance from colleagues Acceptance by the school management
Discontent during the period of professional adaptation	Conflicts between pupils Strained relations between the pupils' parents A great deal of pedagogical documentation Insufficient material equipment of the school
The contribution of the mentor teacher	Time-thematic plan Rating and classification Educational issues Working with pupils with special educational needs Pedagogical documentation Creation of writing assignments Organization of parent meetings
Collaboration between the novice and the mentoring teacher	Consultations Mutual observation Analysis of the lesson Initiative from the beginning

	teacher
Novice teacher cooperation with colleagues and other professionals	Cooperation with primary school management Cooperation with colleagues Cooperation with the school psychologist Cooperation with special pedagogues Cooperation with educational counselor
The course of adaptation education	Process and organization of adaptation education Duration of adaptation education Method of completing adaptation education
Preparation for teaching	Short-term preparation for teaching Absence of teaching preparation Sources and materials for preparation for teaching Poorly processed teaching aids Obligation and importance of preparation for teaching
Challenging pedagogical activities	Management of pedagogical documentation Working with pupils with special educational needs Creating an individual education and training plan Solution to socio-pathological phenomena Keeping the lesson time schedule Rating and classification The fast pace of the beginner's teacher's speech Communication with parents of pupils Insufficient theoretical basis for teaching subjects Keeping pupils' discipline Organization of non-traditional forms of teaching Giving out inappropriate amount of tasks Inappropriate written speech of the novice teacher
Problem-free pedagogical activities	Sufficient theoretical basis of teaching subjects Rules and boundaries of pupil behavior Motivation of pupils Pedagogical Communication

6 Research results

By analyzing the obtained qualitative data, we got results which specify the course of adaptation of the novice teacher of primary education. We summarize the findings by identifying the categories that have proven to be significant. In the following chapters, we present specific research results.

6.1 Experiences of novice teachers during professional adaptation

Our intention was to point out the experiences of beginning teachers during professional adaptation. In this sphere two main areas were developed: positive experiences in the form of expectations and negative experiences in the form of disappointments. The positive experience and the expectation of beginning teachers during the adaptation period is clearly acceptance by their colleagues. It was important for novice

teachers to integrate seamlessly into the teaching staff and create optimal relationships with their colleagues. A favorable atmosphere at the workplace and friendly teacher relationships have been beneficial to the work of a novice teacher. Another positive experience from the adaptation period of the novice teacher was acceptance by the pupils. Pupils have been able to facilitate a difficult period of adaptation through their access to a new teacher. The relationship between a teacher and a pupil appeared to be a significant motivational factor in the work of a novice teacher, based on elements of cooperation, respect and understanding. A positive experience was also the acceptance from the school leadership. Regular communication between the school principal, the deputy headmaster, and the novice teacher played an important role in adaptive learning. Beginning teachers experienced, in addition to their positive experience, various disappointments, a so called "shock from reality". The incidence of this phenomenon is borne out by further research dealing with the issue of professional adaptation. Šimoník (2013) argues that during the first year of pedagogical practice, beginning teachers face confrontation between ideas and hard reality, between the preparation and performance of the profession, between theory and practice. Kosová (2013, p. 8) justifies the presence of this phenomenon by saying that *"theoretical concepts do not correspond to the educational reality and, if they are only lectured, they will remain incomprehensible and useless."* During the adaptation period, beginning teachers were disappointed for several reasons. Most often there was a large amount of pedagogical documentation. Novice teachers did not have the necessary experience and skills to manage this administrative activity, so the management of pedagogical documentation felt as an excessive burden in the exercise of their profession. The material and technical equipment of the schools was another significant disappointment for the novice teachers. The intention of enthusiastic novice teachers was to change and refine traditional education and training practices during the first months of their teaching practice. These changes required high-quality material and technical support, including teaching aids. Beginners did not have modern teaching aids or appropriate technical conditions for the use of modern technologies. Interpersonal social relationships between pupils was another major disappointment for the novice teacher. As we have already mentioned, the relationship between the teacher and pupils did not seem to be problematic, but relations between individual pupils were tense. The reason for disagreements among pupils from the point of view of novice teachers was the rivalry, which also affects the temperament of individual pupils. The relationships with the parents of the pupils, which did not surprise the novice teacher, were also denied. The reason for conflicts between parents was the failure to respect the opinions and instability of the teacher in the classroom.

6.2 Problem-free pedagogical activities of novice teachers

In the context of the experience of novice teachers in the period of their professional adaptation, pedagogical activities, which were initially problematic, have emerged as well as activities that have been found to be trouble-free for novice teachers. Seamless pedagogical activities were conditioned by the strengths of the novice primary school teachers, which, based on our findings, included pedagogical communication. The pupils' communication was then reflected when offered new education; such communication was considered by the novice teachers to be their strong point. Problem-free pedagogical activities from the point of view of beginning teachers included the motivation of pupils during teaching and theoretical readiness for individual subjects. Beginners did not have a problem with the teaching of Slovak language and literature, English language, music education and physical education. The absence of problems in teaching these subjects was related to the previous practice gained when teaching said subjects or had a base in the interests of the novice teachers in primary education.

6.3 Problematic pedagogical activities of novice teachers

The adaptation period of novice teachers brought with them several problematic situations. The problematic and, at the same time, demanding pedagogical activities of the beginning teachers included the management of pedagogical documentation. Beginning teachers had difficulty listing documents such as the class book, the classification sheet or the pupil's catalog sheet. Another problematic area of adaptation was also participation in the creation of the school education program. Beginning teachers felt these shortcomings because of their lacking undergraduate training. Furthermore, problems were also found when upholding the thematic education and training curriculum. For beginners, it was challenging to stick to the time-thematic plans, as our findings often found, novice teachers were often behind on teaching. This situation was then addressed by an unreasonable pace of activity, which resulted in the accumulation of a large amount of homework for the pupils. They often tried to catch up using spare time during consultation classes and physical education lessons.

The thematic plans should follow the preparation for teaching, which was another area that has been proven to be another inadequate competence of novice teachers. Such preparation was deemed time-consuming by the novice teachers. They initially formed their own written preparations, which were elaborate in detail. With time, however, they felt that elaborate preparations were no longer needed. Novices created their own preparation for teaching after completing their adaptation training, which were not elaborated in detail, but they contained the basic parts of the unit of instructions, and the individual points represent a skeleton of the lesson that the novice teacher was supposed to perform. Some novice teachers did not even prepare during their entire adaptation period. We critically evaluate the fact that novice teachers rely mostly on teaching aids, such as textbooks or workbooks, when preparing for lessons, but do not utilize professional literature to further extend their plans, even though some textbooks and workbooks are poorly processed. Preparing for teaching should be the responsibility of every teacher, not just the beginning teacher, because the correct preparation affects the course and the results of the teacher's educational activities. Preparing for teaching also includes written assignments. Written assignments meant for pupils were shown to be one of the trickiest problems. Beginning teachers were not experienced in this activity. Problems were especially caused by the creation of dictates on Slovak language lessons. This activity involved the assessment and classification of pupils, which also proved to be a demanding pedagogical activity for novice primary school teachers. Beginning teachers had the problem of objectively evaluating the achievements of pupils, and these problems occurred in both the formatting and the summative evaluation. The grading tables were helpful with being able to judge the pupil's performance. Because of this underdeveloped competence, some novice teachers do not even carry out verbal oral examinations of pupils. Problems in the evaluation also occurred during the pupils' continuous assessment. Extremely demanding activities in the context of the implementation of the teaching curriculum, with which novice teachers meet during the adaptation period, were to work with pupils with special educational needs. These pupils were integrated within the normal class, which greatly complicated the educational activity of the novice teacher. Integrated pupils required individual teacher access, as well as special care by a special pedagogue and a school psychologist. This is a demanding activity that requires the necessary knowledge, skills and experience which the novice teachers simply do not have yet. Because of this, working with pupils with special educational needs seems very demanding. Another challenging activity for novice teachers was the identification of socio-pathological phenomena. Bullying among pupils was one such problem, which is hard to crack. Solving similar situations also required certain skills and experiences that were not too extensive during the adaptation period. The organization of non-traditional forms of teaching has also proven to be another demanding pedagogical activity for novice primary school teachers. It was mainly about the organization of educational and cultural activities for pupils.

This activity was challenging, when trying to ensure the entire organization of events that were under the command of the novice teacher would happen smoothly. Another important problem for novice teachers was to maintain the discipline of pupils in and out of the classroom. Maintaining order in the class had a clear impact on the course of the educational process and the atmosphere in the classroom. Beginner teachers used the methods of rewards and punishments to change pupil behavior. The rewards were in the form of praise, organization of excursions, trips and similar activities. The punishment for pupils who violated the discipline was a written record in a classroom book or detention, which took place after all the classes were dismissed. In the afternoon, the novice teacher paid attention to catching up to the missed lessons. Novices have often tried to keep discipline during the classroom with just simple vocal warnings. Based on our findings, it has proven effective to create clear rules at the beginning of the school year, which pupils should follow in classroom and beyond. Written speech is another activity that appeared to be a difficult and problematic for novices. The written material of the beginner teachers on the classroom board was deemed insufficient, but the teachers were fully aware of this lack of skill and argued by mentioning their insufficient undergraduate training. This is what some novice teachers try to avoid, which is almost impossible in this profession. If a novice doesn't succeed in their educational activity, Vincejová (2014) recommends trying to search for one's own faults, taking responsibility for the preparation of the lessons and the overall approach to work. It is precisely because of the presence of these complications that it is imperative that the activity of the novice teacher be controlled and directed by the mentoring teacher.

6.4 Cooperation of the novice and the mentor teacher

The aim of our research was, besides identifying problematic and problem-free pedagogical activities, to explore the elements of co-operation of novice and mentoring teachers. Cooperation within the framework of the adaptation training takes place most often in the form of regular consultations, during which the mentor teachers provided counseling, communication, or guidelines for teaching activities to novice teachers. Another form of cooperation was mutual observation. Observations conducted by the mentors during the novices' lessons offered optimal conditions for observing pedagogical activities of the teacher, pupils and their cooperation, based on which the mentoring teachers could gather objective information about the process of adaptation. The number of observations done differs, as novice teachers stated that the mentors conducted these observations anywhere between two to five times. The mentoring teachers claimed to have conducted more than five observations of the lessons of novice teachers. As part of the cooperation, the teachers involved contributed to the analysis of the observed lessons, which were excellent feedback for the beginner teachers. Interviews were used by the mentors as an additional source of information they had overlooked during observations. Mentoring teachers' primary focus is not on pointing out mistakes in the pedagogical work of the novices, but primarily to help their personal growth and professional development. Novices' work inadequacies were highlighted sensitively by mentoring teachers, and further steps were suggested to them on how to remove them. The results of our research point to the significant contribution made by the mentor teacher during the period of professional adaptation, which is mainly related to their long-term experience in pedagogical practice at the primary level of education. The most important contribution of the teaching staff was the guidance of novice teachers with how to handle pedagogical documentation. Benefits can also be noted when introducing the basic school organization. Mentor teachers have provided the beginner with the necessary basic information about the course and the day-to-day school regime. Mentors directed novice teachers not only in preparing for their lessons, written assignments, but also in evaluating and classifying pupils, which, as we have already mentioned, is one of the problematic activities for novice teachers. Teaching staff also play an important role assisting when identifying and addressing socio-pathological phenomena.

Mentors were very helpful if novices needed advice on the organization of parental meetings. The period of adaptation of starting teachers has brought about situations that required the co-operation of novice teachers with school heads, colleagues and other professionals. Beginning teachers were most likely to seek help from a special school pedagogue, school psychologist and the educational counselor. According to Vincejová (2014), the work of the mentoring teachers will be successful if the novice teachers learn to apply the knowledge gained during the undergraduate training to the specific conditions of the educational process, and at the same time, if they can use their knowledge of didactics in practice.

6.5 Adaptive education process of novice teachers

One of the objectives of our research was to analyze the adaptation process of a novice teacher, including adaptive education. Our intention was to find out the extent of adaptive education compliance with legislation. Based on our findings, we show and describe the following conclusions. Novice teachers have undergone adaptive education in one school year. During this period, the mentor teachers were assigned to the novices. Adaptation training was conducted based on the co-operation of novice teachers with their mentors. The main forms of cooperation included consultations, mutual visits and analysis of lessons. Beginning teachers received regular feedback, but the initiative was mainly expected from beginning teachers. Beginner teachers completed adaptive education through an open teaching lesson before a commission consisting of a mentor teacher, a school principal or a deputy director of elementary and lower secondary education. After the open lesson, members of the Commission expressed their opinion on the pedagogical activity of novice teachers, submitted feedback in the form of recommendations or guidelines. Upon completion of the adaptation training, a protocol was signed by all members of the commission, and within two weeks a decision was made by the director of the elementary school, which turned the beginner teacher into a self-employed pedagogue ranked with a higher pay grade.

Based on our findings, it can be argued that the course of adaptation education in Slovakia coincides with the legislation, because according to Act no. 319/2009 on Pedagogical and Professional Employees, it is the responsibility of every novice pedagogical staff to undergo adaptation training under the guidance of the mentoring pedagogue. In the EU countries, adaptive education is being implemented in the form of various adaptation programs that combine several features, which at the same time differ slightly from the organization of adaptation education in Slovakia. From the point of view of lifelong learning, there are certain differences between adaptive education in Slovakia and adaptation education in EU countries. Foreign graduates of pedagogical faculties do not end their education after graduation. Upon completion of elementary education, they will only receive a teacher's "beginner qualification" and receive a teacher's testing qualification status, only receiving a full license after one or two years. Adaptation programs abroad differ from ours to organization, structure and complexity, which means that they are well structured and monitored, clearly defining the responsibilities of heads of teaching staff. An indispensable element in the process of adaptation abroad shows a close co-operation between the beginning teacher and the mentor teacher. Both actors of the adaptation program will be accountable responsibly. Abroad, much more attention is paid to the professional education and professional growth of primary school teachers compared to teacher in our conditions.

7 Conclusion

Teachers of primary education, during the development of their careers, go through several stages of their career path, from the career choice phase to the professional extinction phase. Our article has highlighted the beginnings of the teaching profession, namely the period of professional adaptation of starting teachers. Professional adaptation is considered by many professionals to

be the most important stage of the teaching profession as the experience gained during this period plays a significant role for their further professional development.

The process of adaptation of the starting teacher of primary education was determined and judged in real schools or classes during various subjects. The aim of our study was to analyze the process of adaptation of a beginner primary teacher in the widest possible sense and to point out problematic and problem-free pedagogical activities that are challenging for a novice teacher. Our intention was to explore the elements of cooperation during the professional adaptation between the beginner and the mentoring teacher of primary education.

Using research methods of direct unstructured observation and individual semi-structured interviews, we have discovered interesting findings. The research results offer a detailed description of the progress of adaptation of novice teachers. We found out how meaningful were the novices' positive and negative experiences. We identified pedagogical activities that are problematic and trouble-free for novice teachers. We have highlighted the importance of co-operation among novices and mentors, highlighting the presence of mentor teachers in adaptive education. Our findings confirmed the consistency between adaptive education in fact and legislation.

It should be emphasized and pointed out that our findings can't be generalized to the entire population of novice teachers, but based on our results, we can propose measures to streamline the adaptive process of starting teachers in the form of recommendations for pedagogical practice. Based on our findings, we propose to adjust the organization of adaptation education. During the period of transition of a novice teacher to an independent primary teacher, a mentor teacher plays an important role. As part of adaptive learning, we propose to intensify cooperation between novices and mentors in the form of regular consultations, obligatory mutual visits and deeper analysis of individual lessons. Výbohová (2012) argues that direct observation by the mentoring teacher informs them about the current capabilities of the novice teacher, which should be analyzed later. This understanding enables the novice teacher to improve their pedagogical skills and knowledge to the level of an independent teacher. Skills should also be trained with college teachers in parallel years (if the school's capacity permits) and classes in which educational problems occur. By intensely performing observations on the lessons of experienced colleagues, beginning teachers would be able to acquire the skills of working with pupils with special educational needs and would be inspired by methods or forms of work with non-disciplined pupils. In this way, beginning teachers would recognize different methods and forms of work performed their colleagues, which would facilitate the adaptation process. We also recommend introducing the obligation to create written preparation for teaching throughout the adaptation period, which should be assessed by the mentor teacher. We are proposing to complete the adaptation education through open lessons from each subject the novice teaches.

By describing the adaptation period for novice teachers, we believe that the contribution may be an inspiration to discuss the issue. We know that the data obtained can't be generalized because it's not applicable to the sample of all novice primary school teachers, but we hope that our findings can be beneficial and inspiring for further pedagogical research in the field of professional adaptation of beginning teachers.

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Primary Paper Section: A

Secondary Paper Section: AM

PROBLEMS OF FORMATION OF INNOVATION-ORIENTED INTEGRATED BUSINESS STRUCTURES IN THE DEPRESSIVE REPUBLICS OF NORTH CAUCASIAN FEDERAL DISTRICT

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Abstract. The problems of formation of integrated business structures, as one of the real directions for ensuring the flow of resources into the regional economy of depressed regions are considered in the article. At the same time, in addition to factor analysis, performance indicators are also investigated, in order to obtain detailed and reliable analysis within the framework of innovation-oriented territorial economic cluster. It is proved, that the use of multifactor monitoring of state management by regional economic systems is advisable for an integrated assessment of the effectiveness of involvement of socio-ecological-economic factors and conditions of region development in an increasingly competitive environment, in order to provide the predetermined final results.

Keywords: economic crisis, depressed territories, innovation-oriented development, business structures, sustainable and balanced development, modeling, regional socio-ecological-economic system, innovative cluster, competitive advantages.

1 Introduction

Over the past ten years, two global economic crises have taken place. They significantly affected the economy of the Russian Federation. In addition, the sanctions of the Western powers and the United States also had a negative impact on the economies of the regions. In the governance of many regions there are no modern tools for diagnosing and analyzing the economic situation of the territory. This requires the development of effective apparatus for multifactorial monitoring of the regional economic system of depressed areas.

2 Methodology

The problems of ensuring the sustainable and balanced development of regional socio-ecological and economic systems, based on the formation of innovative-oriented integrated business structures, are the subject of the research. Various methods of economic research are applied: comparative and logical analysis, functional and systemic approach, correlation-regression analysis, and multifactorial monitoring.

3 Research Results

1. Necessity and prerequisites for the formation of innovation-oriented territorial economic cluster in the depressed areas.

In recent years, the necessary structural changes in the regional economic system have occurred in the republics of North Caucasian Federal District, including through the formation of clusters, based on horizontal and vertical integration of business structures, located on the territories of specific regions (Bezirova Z. Kh., Misakov V.S. 2011, Gauzhaev A.Z., Mairov A.Yu., Misakov V.S. 2013., . Misakov V.S. 2006). Increasing

competition forces the governance bodies to develop priority directions, in order to ensure the innovation-oriented development of depressed areas. At the same time, the republics proceed from the fact, that integration processes are the fundamentally important conditions for the development of a vector for sustainable development of the regional economy. Formed clusters should become the basis for the enhancement of innovative activity of the enterprises, belonging to the regional economic complex. This will allow to reduce the gap in the parameters of social and economic development of certain territories.

The experience of the advanced territories convincingly shows that the formation of integrated business structures acts as one of the real directions for ensuring the flow of resources into the regional economy of depressed regions (Granberg A.G., Zaitseva Yu.S. 2007, Misakov V.S. 2016, Misakov V.S., Kuyantsev A.I., Dikinov A.H., Kazancheva H.K., Misakov A.V. 2016). So, for example, in Tatarstan – the region with a stable balanced economy – business integration allowed to reduce the number of intermediaries in the movement of resource flows. This, in turn, not only increased the speed of their movement, but also gave the opportunity to reduce transaction costs. Due to the above information, we can consider the integration of large and small businesses within the framework of newly formed innovation-oriented territorial production clusters as a modern effective mechanism for resource promotion, with a view to the balanced development of depressed areas of the North Caucasian Federal District.

It should be noted, that the Soviet economy had a great deal of experience in the formation of territorial production complexes. The peculiarity of the integration processes of that time was the fact, that they were always initiated by higher administrative structures, and as a rule, they were conditioned and met the interests of the planned system of management (Bekova O.O., Ozdoeva D.M., Misakov V.S. 2011, Gulin K.A., Shabunova A.A., Demenieva I.N. 2007, Sinyuk T.Yu. 2012, Tsurova L.A. 2014).

In the conditions of market economy, integration processes are activated under the influence of increasing competition and are aimed at forming mutually concerned stable links between business entities and financial-credit institutions, ensuring survival, and then, subsequent growth. The main condition and criterion for the necessity of such interaction is profitability.

Over the last 10 years, a new vector in the development of integration processes has been observed - ensuring the tasks of innovative development. In this regard, the integration of business in the parameters of innovation-oriented territorial economic cluster can be considered as a prerequisite for mobilization of innovative activity of diversified enterprises, included in its composition. Of course, this is not an easy task, because it is necessary to coordinate and to achieve the involvement of resources in the formed integration processes. They should be in such amount and have such quality, which are required for the development of certain regions. Today, it is already clear, that integration structures are not only able to support and manage resource flows effectively, but also to serve as a basis for the growth of stability and balanced development of the regional economic system, under the conditions of different environmental impacts.

There are many models of formation of innovation-oriented strategy of sustainability and balanced development of the regional economic system in the professional literature. Effective schemes for resource flows management were developed within the framework of the formed integrated structure... (Bernshtein L.S., Karelin V.P., Tselykh A.N. 1999, Matveeva L.G. 2000, Melikhov A.N., Bernshtein L.S., Korovin S.Ya. 1990, Tsurova L.A. 2016). Common features for various similar models are the following. It is necessary:

- to substantiate the forms and methods of interaction between the diversified enterprises, included in the innovation-oriented regional production cluster;
- to determine the structure and the participants of the formed innovative cluster;
- to determine the characteristics and cost of resource flows, taking into account the expenditures for their movement within the cluster;
- to identify the internal and external factors, determining the direction of resource flows, as well as their impact on the effectiveness of final results;
- to assess the effectiveness of interaction between the diversified enterprises of the created innovation-oriented regional production cluster, to determine its impact on the formation of social and economic potential of the region.

It seems that it is expedient to start the process of creation of integrated structures in depressed republics with the choice of interaction mode between diversified enterprises, forming the innovation-oriented regional production cluster.

New integration business structure will be characterized by high self-organization and strictly verified target orientation. Target orientation may be the minimization of cost of resource flows, required for the implementation of project for the removal of backward territory from the doldrums.

When determining the cost of material resources flows, one must proceed from the accepted idea of the flows circulation at the meso level. A number of parameters are used for the determination, such as the methods of transportation, distance, travel time, volumes of transported resources, their frequency, etc. It has to be noted, that the parameters of material flows are well studied and successfully applied in logistics (Bernshtein L.S., Karelin V.P., Tselykh A.N. 1999, Melikhov A.N., Bernshtein L.S., Korovin S.Ya. 1990, Turova L.A. 2007).

It should be mentioned, that in the depressed republics, the social efficiency of functioning of the system under consideration is particularly significant, and therefore, the resource flows, which are intended to the creation of new vacancies, development of social infrastructure, etc. are extremely important. Of course, in these conditions, the manifestation of social responsibility comes to the fore, and only then the receipt of profit. Such a situation in the market economy definitely requires sufficient state support.

Speaking about self-actualization, about the forms of interaction of diversified subjects, located in municipalities, where the innovative cluster is created, we consider it appropriate to take as a basis for their development the methodology of problem-oriented assessment of the potential of different forms of associated entrepreneurship (Matveeva L.G. 2000). We proceed from the fact that problem-oriented analysis and diagnostics allow to establish the degree of compliance of the selected form of association with the objectives of territories development for a specific period of time. At the same time, in order to obtain a detailed and reliable analysis within the framework of innovation-oriented territorial economic cluster, it is necessary to study the performance indicators, in addition to factor analysis. In the depressed regions, the formed integrated structure within the innovation cluster should be motivated and oriented not only to ensure its own goals, but also to ensure the set of objectives for strategic development of the regional economic system (4, 5). Moreover, it is necessary to define clearly, that the strategic goal of business structures formation within the specified framework (innovation cluster) is to increase the degree of stability and balance of the regional economic system, through the use of economic and resource potential of depressive republics in the strategy of regional balanced growth. Of course, in this context, we proceed from the fact that it is necessary to take into account the interests of each element of the integrated structure, which involve maximizing profits, minimizing costs, expanding sales markets, etc.

Multifactorial analysis allows to identify the opportunities and contributions of a particular enterprise to the final results of the

integrated structure. In this regard, it is advisable to estimate each enterprise by a set of indicators, which characterize its socio-economic potential: personnel (including scientific); material and technical resources, financial, information and organizational, etc. The final results of such a research allow to establish the internal structure of the created system, to define the enterprises, performing specific functions, necessary to support innovative processes, and to determine the quantitative and qualitative characteristics of the resource flow, circulating among the participants of the created cluster.

Equally important is the participation and contribution of the municipality itself in providing a specific type of resources for the created integration structure. In the professional literature there are many approaches to modeling the structure of the innovation cluster, depending on the forms of municipalities, where they are created (Gulin K.A., Shabunova A.A., Demenieva I.N. 2007, Misakov A.V., Afov Kh.Kh. 2010, Misakov V.S. 2006). They can be reduced to two approaches.

In accordance with the first concept, the cluster includes the enterprises of municipalities, the peculiarity of which is the presence of low indicators of socio-economic development. At the same time, the motivation for inclusion of such enterprises into innovation cluster may be an acute shortage of own resources for production and financial activities; the necessity to form and control external relations in order to achieve guaranteed resource flows; the need to improve the competitiveness of production, etc.

In accordance with the second approach, in addition to weak economic entities in the territory of the innovation cluster, it is proposed to include enterprises with high social and economic potential. This approach allows more efficient use of all resources, located at this territory, as well as to expand the sphere of influence.

In any case, to analyze and define the effectiveness of the selected form and structure of interaction, it is required to compare the size of resource flows for each enterprise of resource potential with the need for these resources. In other words, the problem is in the necessity to compare a multitude of resource flows $\{R_i\}$ with a multitude of resource requirements $\{X_j\}$. The method of fuzzy modeling can be used for this (Melikhov A.N., Bernshtein L.S., Korovin S.Ya. 1990).

2. Possible options for the formation of innovative cluster.

In the course of analysis and diagnostics of resource flows, such options are possible, when:

- the set of resource flows for all elements is greater than the set of resource requirements. This form of interaction can be considered as effective, because it not only ensures the implementation of the investment project, but also has additional reserves for the development of territory;
- the set of resource flows is greater than the set of resource requirements only for some separate elements. In such case, this form of interaction can be regarded as generally effective, against the background of inefficient structure, which requires the involvement of new (additional) participants in the integration structure, or the revision of participation degree of its elements;
- the set of resource flows is equal to the set of resource requirements. In this case, the form of interaction can also be estimated as effective, since it ensures the implementation of the investment project. However, it is necessary to take into account the high degree of risk, due to the lack of the required safety margin;
- the set of resource flows is less than the set of resource requirements. It is obviously that this form of interaction is ineffective, because it does not allow the implementation of a given investment project.

At the next stage of the formation of innovation-oriented regional cluster structure, it is required to estimate the cost of resource flows and the options for interaction, in order to make the final managerial decision on the structure of the regional cluster being created. Moreover, the minimum cost of the consolidated resource flow will be the criterion for managerial decision.

Especially, it is necessary to study the indicators, reflecting the potential of labor resources (the number of workers according to specialties, to level of education, to age, etc.). Such an approach will make it possible to determine the ability and level of innovative activity of labor resources in the territory. It should be noted, that this is an important part of the study, because in the depressed republics of North Caucasian Federal District, especially in mountainous areas, the majority of population is characterized by a lack of systematic orientation and opening of new opportunities, as well as low susceptibility to innovative development.

In the course of our study, more than 95% of the mountain entrepreneurs make it clear that they do not even think about carrying out their activities in the field of innovative business. They practically did not hear anything and were not interested in information about targeted programs for supporting innovation business. They have never been at the republican competitions and exhibitions of such type. It is obviously, that regional and municipal authorities make precious little efforts to promote innovative development. It is necessary, that the population in depressed republics in the shortest possible time becomes an active object of innovative relations. Of course, this requires significant material costs, but the formation of "innovative" labor resources, the creation of innovative labor potential is the only way to form skilled innovative and active workers in municipal areas. And this is natural, because the rotational system of human resources attraction is ineffective for forming a labor potential in the mountainous territories of depressed republics (Misakov V.S., Herter I.K. 2011, Misakov V.S. 2016).

It should be noted that the availability of human, financial, material and other resources in the region does not guarantee its innovative development, and it is not sufficient imperative. In depressed republics, the development of the regional economy is also influenced by a mass of informal factors, which are the consequences of complex ethno-cultural, socio-psychological, geopolitical and other processes.

All this requires the identification and analysis of factors, affecting the formation of resource flows. Such methods as SWOT (meso level) and PEST (macrolevel) analyzes are successfully used in this case. They allow to explore the state of regional economic system on the basis of parameters of internal and external environment (the conditions in which innovative activity takes place), as well as to assess its competitive advantages.

It is noteworthy that, even if we propose to determine the resource flows using the impact factors of macro- and meso-levels, at the same time they are the instrument for ensuring a set of socio-economic and political goals.

Estimation of final results of the innovation cluster can be determined in two ways:

- the analysis and diagnostics of the effectiveness of integration interaction between different enterprises - participants of cluster;
- the analysis and diagnostics of integration interaction and impact on the socio-economic potential of the territory.

The effectiveness of participants in the innovation cluster can be assessed as positive, only if, as a result of functioning, each participant has the opportunity to fulfill its own goals, which it can't achieve, if he functions outside the cluster. For example, the indicator of profit, access to new markets, etc.

At the same time, regional economic system can't be characterized only by indicators of economic development - it is also necessary to take into account the parameters of socio-cultural sphere, the environment... In this regard, in order to assess the contribution of final results of integrated structure to the potential of the territories, it is necessary to determine the socio-economic potential of the region and its spatial distribution.

In the course of our research, we faced such a problem as the absence of official sources of information. Most of indicators, required for the analysis and diagnostics of republics' potential, are either absolutely absent or have contradictory meanings about the level of innovative activity of business structures, including due to fuzzy understanding of the concept "innovation activity". Of course, it must also be taken into account, that a number of data, necessary for analyzing and diagnosing the cost of resource flows, is rather difficult to obtain, since they relate to the activities of certain entrepreneurial business structures, and are not provided to interested institutions or analysts (such as wages, production costs, etc.). In this connection, in course of our research for modeling of innovative-oriented strategy of management by balance and sustainability of development of the regional economic system, we had to use relative-factual data, established with a certain level of reliability, and derived from the official data of the Federal State Statistics Service of the Russian Federation for the republics of North Caucasian Federal District, and data of the Federal State Statistics Service of the Russian Federation. In addition, we involved experts from the public areas. Despite some margin of error, it can be said, that the use of relative-factual data made it possible to obtain the adequate notion of the socio-ecological and economic situation of the areas under study.

4 Conclusion

In the depressed republics of North Caucasian Federal District, it is necessary to create a favorable socio-cultural environment, to involve new training and development programs in the sphere of innovations, and to attract external innovation-active resources. Such an approach will unconditionally allow to develop a strategy for management by the sustainable social and economic development of the territory, to achieve an additional effect, which will significantly enhance the socio-economic potential of the region.

The analysis of the dominant characteristics of methods, used for the control of regional development in the current period, gives the opportunity to conclude that they are not effective mechanisms for the optimal allocation and involvement of resource potential of depressed areas, and they don't allow for the sustainable development of the regional economy.

Consideration of problems of asymmetric development of depressed territories through the prism of solving problems of systematically balanced development of regional economies made it possible to define as a priority direction in the current regional policy the mobilization of growth points of proportional development of the social and economic potential of the republics of the North Caucasian Federal District, in order to achieve long-term socioeconomic equilibrium.

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Primary Paper Section: A

Secondary Paper Section: AE, AH

COMPARATIVE STUDY OF SLOVAK AND AUSTRIAN APPROACH TO GDPR

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Article was published from the academic grant Action Slovakia - Austria

Abstract: Article deal with the GDPR from the comparative perspective of two neighboring countries: Slovakia and Austria. Firstly, the article deals with the necessity to enact a national law in the Member States. Then the article deals with the specific provisions of the GDPR firstly providing specific duties to Member states and secondly giving certain leeway to Member states. On explanation of those two types of articles the comparison is provided.

Keywords: GDPR, Data Protection, European Union, Slovakia, Austria.

1 Introduction

Personal data are part of the fundamental rights and freedoms. "A decade after the promulgation of the directive, the EU entrenched its commitment to data privacy by ratifying Article 8 of the Charter of Fundamental Rights of the European Union, which came into effect with the 2009 Treaty of Lisbon. Article 8 is entitled Protection of Personal Data..."¹ and stipulates besides that everyone has the right to the protection of personal data concerning him or her. It is mostly significant in case data includes the racial and ethnic origin. "The Union uses its powers and interferes with the increasing range of fields of human activities and therefore touches directly the individuals in the Member States. The new public power appears that has to be fettered by bonds of fundamental rights."² "Current challenge for the fundamental and human rights is the digital world. It is obvious that the digital world has different challenges than the "real" world. The data protection reform fully covers the data protection in digital world and digital era."³

Since 25. May 2018 the new rules for data protection in EU applies. "Reform of personal data protection is fundamental to the creation of a digital single market, which is a priority of the Union and aims liberties associated with the EU single market to expand to the digital world"⁴ General data protection regulation (GDPR)⁵ can be called as a significant milestone in the data safety. "This uniform legislation at level of European Union replaces the current divergent national legislation of the Member States of the Union."⁶ GDPR attracted the attention of the whole world in the area of data protection for the reason that the rules apply to any controller which is dealing with personal data of EU citizens or residents. "Although the GDPR is an European Union Regulation, its territorial scope does not stop at European boundaries. Given a global economy with multinational groups and cross-border data transfer, international aspects have been taken into consideration upon creation of the GDPR."⁷ It means that the registered seat and the territory where are the data proceeded is not the significant factor for determining whether the controller should comply with GDPR rules or not.

GDPR changes also the view on the protected data. The answer to the question what should be protected based on the GDPR is changed comparing to previous directive. The scope of the protection was extended to any data which can be linked directly or indirectly with a specific person. There are two possible theories relating to determine whether it is already a data which is under protection of GDPR or not. Based on the absolute theory it would be any data which can be linked to a specific person no matter what time, sources it takes. The relative theory is based on the principle of adequacy which means that the sources invested into linking the data with a specific person should be adequate in time, finances, human sources. Also, the current stage of technology development is important to consider. I would prefer to use the relative theory which is also highlighted in recital 26 of GDPR.⁸

Significance of the GDPR is given also by the structure of the fines and the penalty system which comes into the question when there is no compliance with the regulation. The penalty system is like the competition law penalty system, where penalties are considered based on the annual turnover of the controlled subject.

As far we know generally regulation does not need any implementation and based on the general principles of the EU law the regulation has the direct effect which means that Member states apply the regulation with no need of further action of the Member states to implement. GDPR and the implementation seem more comprehensive issue. Firstly, there is a fact that all Member states have national legislation about the personal data protection as far the previous data protection legal framework was Directive⁹ where the national implementation is necessary. This issue can be solved easily as far the jurisprudence of the Court of Justice is settled here and states that the national law does not apply in case it is not in compliance with EU law, which is based on the well-known principle of supremacy of EU law¹⁰. The second issue with implementation is that the GDPR allows to the Member States several possible differences, derogations and exemptions leaving them on the Member states and their national laws. For example, the article 9 para 4 GDPR¹¹ leaves some space for the Member states to extend the conditions related to proceeding of the special categories of personal data (sensitive data). The third issue is that together with GDPR a Police Directive¹² was also enacted which must be implemented by Member states. Member states therefore implement also a national legislation related to GDPR to a) change the current national law based on the previous Directive b) implement the possible exemptions given by GDPR and c) implement the Directive.

The European Parliament in December 2017 provided an overview of the GDPR implementation in all EU Member states¹³. According to this material not all of the Member stated work on the implementation of GDPR on time.

¹ Post, R.: Data Privacy and Dignitary Privacy: Google Spain, the Right to Be Forgotten, and the Construction of the Public Sphere (April 15, 2017). Duke Law Journal, Forthcoming; Yale Law School, Public Law Research Paper No. 598

² Hamulák, O.: Idolatry of Rights and Freedoms, In: Protection Rights in the EU, Controversies and Challenges of the Charter of Fundamental Rights, Springer – Verlag Berlin Heidelberg, 2014, p.: 197

³ Ježová, D.: Fundamental rights in the European Union – perspective of the digital era, In: Human Rights in EU external relations: Between law and politics, Bratislava: Comenius University, 2017, p. 86

⁴ Ježová, D.: Data Protection in Virtual World, In: Právní rozpravy 2017, Hradec Králové: Magnanimitas, 2017, p. 63, ISBN: 978-80-87952-18-4

⁵ Regulation (EU) 2016/679 of the European parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), L 119/1

⁶ Ježová, D.: EU digital single market – are we there yet?, In: AD ALTA: journal of interdisciplinary research, year 7, No. 2 (2017), p. 100

⁷ Voigt, P., Bussche, A.: The EU General Data Protection Regulation (GDPR) A Practical Guide, Springer – Verlag Berlin Heidelberg, 2017, p. 22

⁸ Recital 26 GDPR: To determine whether a natural person is identifiable, account should be taken of all the means reasonably likely to be used, such as singling out, either by the controller or by another person to identify the natural person directly or indirectly. To ascertain whether means are reasonably likely to be used to identify the natural person, account should be taken of all objective factors, such as the costs of and the amount of time required for identification, taking into consideration the available technology at the time of the processing and technological developments.

⁹ Directive 95/46/EC of the European parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data

¹⁰ Case Costa v. ENEL 6/64, Simmenthal case 106/77, etc.

¹¹ Art. 9 para 4 GDPR: Member States may maintain or introduce further conditions, including limitations, with regard to the processing of genetic data, biometric data or data concerning health.

¹² Directive (EU) 2016/680 on the protection of natural persons with regard to the processing of personal data by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data and repealing Council Framework Decision 2008/977/JHA

¹³ See below: <http://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupMeetingDoc&docid=9350> (accessed 24.06.2018)

2 Slovakia and GDPR

Slovakia was one of the Member states countries which enacted the national legislation on time and before 25. May 2018. Slovakia enacted on 29. November 2017 Act No. 18/2018 Coll. on Personal Data Protection which repeals the previous act No. 122/2013. The Act was declared on 30. January 2018 and came into effect on 25. May 2018. Here we can conclude that Slovak republic was ready for the GDPR and Slovak citizen and controllers could prepare for GDPR for almost four months. Slovak republic gave sufficient time and therefore also the legal certainty for the national controllers to implement and comply with GDPR.

Looking deeper into the Slovakian Act we will discover that Slovakian Act includes the GDPR and the Police Directive together. Slovakia chose to enact a completely new legislative Act and reveal the previous legislation. The Act is divided into six parts and 112 articles. The first part of the Act is about the general provisions. This part is the almost the same as the GDPR. We can find here the definition same as in GDPR, the scope of the Act, and the guarantee of the free movement of personal data. Slovak republic guarantees that it will not forbid the transfer of personal data within EU Member states based on the fundamental right protection of natural persons.

The second part of the Act are the general provision for personal data protection of natural persons by processing of data. Here the principles can be found¹⁴ (same as in Article 5 GDPR), the provision about the lawfulness of processing, provision about the consent of the data subject, processing of the special categories of personal data, provision about the rights of the data subject, rights and duties of the controller and processor, security of personal data, assessment of the impact on personal data protection and previous consultation, data protection officer, transfer of the personal data to third countries or to the international organizations.

The third part includes the special provisions of the protection of personal data by processing by several authorities, which applies for the criminal procedures. This part is the implementation of the Police directive. We can find here principles, rights of data subject, rights and duties of the authorities and processors, transfer of the personal data to third countries or to the international organizations.

The fourth part is about the specific situations of the lawfulness data processing, where we can find legal provisions about processing personal data without the consent of the data subject for academic purposes, artistic purposes and literary purpose, unless the processing breaches the right for privacy. We can also find here the lawfulness of processing personal data without the consent for informative purposes of the public by media, by employee. The rules for processing the data of the deceased person, confidentiality rules.

The fifth part stipulates the rules about the Office for Personal Data Protection. It states the rights of the office, codes of conduct, certificate which can be obtained from the certification authority, rules for providing the control by office, and the procedural rules for the proceeding on personal data protection, administrative offences and fines.

The sixth part are the common, transition and final provisions.

Supervising authority in Slovakia based on the GDPR is the Office for Personal Data Protection (Úrad na ochranu osobných údajov)¹⁵. Controlling authority enacted also the methodical guidelines regarding the applicability of the Slovak Act in practice address mostly to controllers. One of the methodic

guidelines¹⁶ deals with the issue when do we apply the Slovakian Act and when is the GDPR applied. Based on the guidelines we differ between a controller who provides the activity which falls within the EU law and in this case GDPR should be applied and the Act is applied only in limited way and only several provisions of part one, part four, five and six should apply on the controller. On the other hand, when there are activities of the controller which do not fall within EU law the Slovak Act should apply primary on that activities. This is based on the recital 16 of GDPR¹⁷ where it is stated that GDPR does not apply to ex. protection of fundamental rights and freedoms.

3 Austria and GDPR

Austria same as Slovak republic belongs to one of the Member states which were able to enact the national legislation before the provided deadline by EU. Austria had even the second place in "the race" of adopting the national legislature, while the first place belongs to Germany. Austria enacted the national law on 31 July 2017, which is about ten months before the given deadline and for four months sooner than Slovakia did. Austrian national Act is called Federal Act concerning the Protection of Personal Data (DSG 2000).

Austrian did not enact a new legislative Act but chose to amend the current legislative Act from the year 1999. Austrian Act consist of five parts and 70 articles. The first articles deal with the general provision such as general right of the data protection, scope of the Act. The first part is all about the implementation of the Regulation and deals with the issues included in GDPR such as right of data subject, special categories of data, special attention is given to processing of images of data subject, deal with the supervisory authority, with the sanction mechanism. Third part of the Act is the implementation of the Directive and includes rules for processing of personal data for purposes of the security police, including the protection of public security by the police, the protection of military facilities by the armed forces, the resolution and prosecution of criminal offences, the enforcement of sentences and the enforcement of precautionary measures involving the deprivation of liberty. The fourth part is dealing with the special penal provisions such as administrative penalties and processing with the intention to make a profit or to cause harm. The last fifth part are the final provisions.

Under Austrian privacy law, the fundamental right to data privacy will still apply in Austria not only to natural persons, but also to legal persons. By contrast, the GDPR and most EU national privacy laws only apply to personal information pertaining to natural persons. The Austrian Act includes also specific regulations on the permissibility of processing personal information contained in photographic or video materials. It regulates the use of CCTV on public and private property, as well as the use of video recording for the purpose of monitoring employees.

Austrian supervisory authority is Austrian Data Protection Authority (Datenschutzbehörde)¹⁸. Austrian authority also enacted methodical guideline. Austria has created also a Data Protection Council which shall comment on questions of fundamental importance for data protection, promote the uniform further development of data protection, and advise the Federal Government on legal policy in the case of projects relevant to data protection.

¹⁴ Principle of lawfulness, fairness and transparency, purpose limitation, data minimization, accuracy, storage limitation, integrity and confidentiality and accountability.

¹⁵ Official web page: <https://dataprotection.gov.sk>

¹⁶ Methodical guidelines available on: https://dataprotection.gov.sk/uouu/sites/default/files/kedy_zakon_kedy_nariadenie.pdf (accessed 24.06.2018)

¹⁷ Recital 16 GDPR: This Regulation does not apply to issues of protection of fundamental rights and freedoms or the free flow of personal data related to activities which fall outside the scope of Union law, such as activities concerning national security. This Regulation does not apply to the processing of personal data by the Member States when carrying out activities in relation to the common foreign and security policy of the Union

¹⁸ Official webpage: <https://www.dsb.gv.at/> (access on 30.06.2018)

4 Slovakia and Austria - duties and margins according to GDPR

In this article the goal was to compare two countries Slovakia and Austria and their approach to GDPR, which will be demonstrated on the GDPR provisions giving at the exemptions and derogations to national legislations.

First group of the provisions of GDPR provides duties to the Member states such as article 36, article 40, article 42, article 54, article 58, article 84 and article 85. The comparison will be done whether both countries complied with the provided duties.

Article 36¹⁹ stipulates the duty of the Member states to include the supervisory authority into the legislative procedure at least by consulting it. Slovak republic did comply with this requirement as far Office for Personal Data Protection included in the legislation process of the new Act of Parliament No. 18/2018 Coll. Austria also complied.

Based on article 42²⁰ the Member states shall encourage the establishing of certification mechanism and of data protection seals and marks. Slovak republic did comply with this article very well and we can find the provisions about the certification already in general articles § 31 where the controllers and processors are encouraged to have certificates to prove their compliance with the technical and organization measures taken for the data protection. More specific provisions we can find in the § 86 where is specified that the certificates are issued by the Office for Personal Data Protection or the certification authority. The certificate demonstrates that the controller or processor is in compliance with the data protection rules and providing sufficient securities. The certificate is valid for three years. Slovak law stipulates in detail the process for obtaining the certificate. Obtaining the certificate is not obligatory, but voluntary. On the other side when the controller already obtained the certification he has a new duty and that is to maintain the standard of protection during the whole validity of the certification and to inform the office about any change. On the official webpage the Office for Personal Data Protection should publish the list of issued certificates. Until today I did not find any certificates on the official webpage. In Austrian Act there are no provisions about the certification at all.

Another article giving a duty for action to the Member states is article 54²¹ according which every Member state needs to establish a supervisory authority and rules and procedures and other conditions and prerequisites of the authority. With this regard the recitals 117 and 121 are useful stating that establishing the supervisory authority is an essential component of the protection and stating that member states should even be able to establish more than one supervisory authority. Again, it was checked whether Slovak republic and Austria did comply with this duty. The answer for Slovak republic is positive. On the other hand, Slovak republic has established on one supervisory authority not more are stated in recital of GDPR. We

can find the whole part five of the Slovak act as a part dealing with the supervisory authority, establishing the organization of the authority, the authority consists of the chairman and vice-chairman. The law stipulates the role and the competencies of the authority. The law stipulates the procedural rules for the inspection of the authority, and the special procedure of the protection of personal data, which aim is to investigate the violation of the rights of data subject in the processing of their personal data or the violation of this law or a special regulation in the sphere of personal data protection and, if it is found, to remedy the deficiencies and, if justified, to impose corrective measures or a fine for breach. The proceeding can be started even *ex officio*, which means no specific application is needed. The time limit 90 days is provided to finish the procedure and to let the authority decide. In case the breach is proved the authority has the competence to order the measures for correction, to cancel the certificate or to order a fine. The answer for Austria is positive also. Austrian Act deal with bodies in the whole part two of the Act. Austria also fulfilled the expectations of EU mentioned in the recital and established more than one supervisory body. Based on Austrian law there are two bodies – Data protection Council and Data Protection Authority. In the law we can find very specific provisions about the establishment of those bodies, composition, power and jurisdiction, procedural rules for the control mechanism.

The sanction system of the GDPR is frequently discussed as far the sanctions are much higher than it used to be according to previous directive. Article 84²² GDPR stipulates another duty to Member states connected with the sanction mechanism and ordering them to lay down the penalties applicable to infringements which shall be effective, proportionate and dissuasive. Slovak republic is again in compliance with this duty and in § 104 and next the sanction mechanism is laid down. The sanction mechanism stipulates that the maximum fine is 20 million Euro or 4% of the gross worldwide turnover for the processor or controller in case of and the lower inn case of serious breaches such as breaching one of the principles of data protection, breaching some of the rights of the data subject, breaching the duties when transferring the data to third country, or breaching the duty of lawful processing of personal data. “Lower” sanction is up to 10 million Euro or 2% of the gross worldwide turnover in case of breaching particular duties of the Act. Austria also complied when included the part four into the national law which stipulates the special penal provisions. Austrian law is referring to the regulation and stipulates only the special provisions based on the examined article.

Another group of GDPR provisions are the provision where the action of the Member states is voluntary and the GDPR gives the Member states options to apply some exceptions if they are willing to. Those provisions are not proving any duties but giving the Member states leeway within the scope of GDPR. Those provision are mostly searched by the processors and controllers and they are specially interested to learn about them. In this article two chosen provisions were examined.

Article 6²³ allows Member states to maintain or introduce more specific provisions to adapt the application of the rules of this Regulation with regard to processing for compliance with points (c) and (e) of paragraph 1. Recital 45 clarifies that the obligation to carry out these types of processing should have a basis in Union or Member state law. Moreover, the obligation in question should be clear and precise and its application should be foreseeable to persons subject to it (Recital 41). In these respects, member states can more precisely determine specific

¹⁹ Article 36 para 4 GDPR: Member States shall consult the supervisory authority during the preparation of a proposal for a legislative measure to be adopted by a national parliament, or of a regulatory measure based on such a legislative measure, which relates to processing.

²⁰ Article 42 GDPR: The Member States, the supervisory authorities, the Board and the Commission shall encourage, in particular at Union level, the establishment of data protection certification mechanisms and of data protection seals and marks, for the purpose of demonstrating compliance with this Regulation of processing operations by controllers and processors. The specific needs of micro, small and medium-sized enterprises shall be taken into account

²¹ Art. 54 GDPR: Each Member State shall provide by law for all of the following: (a) the establishment of each supervisory authority; (b) the qualifications and eligibility conditions required to be appointed as member of each supervisory authority; (c) the rules and procedures for the appointment of the member or members of each supervisory authority; (d) the duration of the term of the member or members of each supervisory authority of no less than four years, except for the first appointment after 24 May 2016, part of which may take place for a shorter period where that is necessary to protect the independence of the supervisory authority by means of a staggered appointment procedure; (e) whether and, if so, for how many terms the member or members of each supervisory authority is eligible for reappointment; (f) the conditions governing the obligations of the member or members and staff of each supervisory authority, prohibitions on actions, occupations and benefits incompatible therewith during and after the term of office and rules governing the cessation of employment.

²² Art. 84 GDPR: Member States shall lay down the rules on other penalties applicable to infringements of this Regulation in particular for infringements which are not subject to administrative fines pursuant to Article 83, and shall take all measures necessary to ensure that they are implemented. Such penalties shall be effective, proportionate and dissuasive

²³ Art. 6 GDPR: Member States may maintain or introduce more specific provisions to adapt the application of the rules of this Regulation with regard to processing for compliance with points (c) and (e) of paragraph 1 by determining more precisely specific requirements for the processing and other measures to ensure lawful and fair processing including for other specific processing situations as provided for in Chapter IX.

requirements for the processing and other measures to ensure lawful and fair processing. In Slovakian Act § 13 deals with the lawfulness of processing data and the usage of the mentioned article is very broad stipulating that legal basis for the processing of personal data pursuant to paragraph 1 (c) and (e) shall be provided in the Act, in a special regulation or in an international treaty to which the Slovak Republic is bound; a separate law must specify the purpose of the processing of personal data, the category of persons concerned and the list of processed personal data or the extent of the processed personal data. Slovakian act did not stipulate any specific rules yet and kept the more precisely usage in very broad way referring on other legislative act of Slovak republic. Austria has those provisions in § 7 and 8 of the Austrian Act DSGVO.

The art. 9 para 4²⁴ GDPR allows national authorities to maintain or introduce further conditions related to special categories of data, including limitations, with regard to the processing of genetic data, biometric data or data concerning health. Based on the recital 53, this should not hamper the free flow of personal data within the Union when those conditions apply to cross-border processing of such data. Recital 51 and 102 are relevant when reading this article, stating that some of the personal data are part of the fundamental rights and freedoms which should be considered as special categories of data. "A set of new rules is laid out in the Regulation for processing personal data under the scientific research exemption. For instance, further use of genetic data for scientific research purposes, without obtaining additional consent will be allowed, if the specific conditions are met."²⁵ Slovak republic already extended the extension from the general prohibition of processing special categories of personal data adding one new legal reason allowing to process the special category of personal data which is connected to some already existing Slovakian law and includes the necessity of processing them for the purpose of social insurance, social welfare insurance of officers and soldiers, the provision of state social benefits, the promotion of social inclusion a natural person with severe disabilities into society, provision of social services, the implementation of measures of social protection of children and social guardianship or for the purpose of providing assistance in material need, or processing is necessary for the purpose of performing duties or the rights of the operator responsible for processing in the field of labor law and in the area of employment, if the operator follows the relevant regulations or an international treaty binding the Slovak Republic. Austrian approach to the given task is slightly different and the Act specifies the different approach. Article 7 of Austrian Act deals also with lawfulness of processing special categories of data for archiving purposes stipulating that if special categories of personal data are to be collected, an important public interest in the research project must exist; furthermore, it must be ensured that the personal data are processed at the premises of the controller ordering the research project only by persons who are subject to a statutory obligation of confidentiality regarding the subject matter of the research project or whose reliability in this respect is credible. The Data Protection Authority shall issue the permit subject to terms and conditions, insofar as this is necessary to safeguard the data subjects' interests which deserve protection. A request be accompanied by a statement signed by the person authorized to exercise rights in respect of the data files from which the personal data are to be collected, stating that this person is making the data files available for the research project. Even in cases where the processing of personal data for scientific research purposes or statistical purposes is permitted in a form which allows the identification of data subjects, the data shall be coded without delay so that the data subjects are no longer identifiable.

²⁴ Article 6 GDPR: Member States may maintain or introduce further conditions, including limitations, with regard to the processing of genetic data, biometric data or data concerning health.

²⁵ Shabani, M., Borry, P.: Rules for processing genetic data for research purposes in view of the new EU General Data Protection Regulation, In: European Journal of Human Genetics (2017)

5 Conclusion

The aim of this article was to introduce approach to GDPR taken by two different countries Slovakia and Austria. Comparing those two countries is much more difficult than comparing Slovakia and Czech Republic which are historically very close countries mostly with very similar approach. Nevertheless, Austria is a federal republic where the organization of the legal system is different than in Slovak republic which is landlocked country. On the other hand, historically Slovakia and Austria had common history in the times of Austro – Hungarian Empire where general legal principles were established²⁶. Therefore, comparative study of those two countries are mostly challenging.

Based on the examination of the approach of those two countries we can conclude that the approach is very similar but not the same. Slovakia enacted completely new Act of Parliament and Austria preferred to keep the current Act and the changes were made by the amendment of the existing legislative Act. Both countries used the same approach where implementing the Regulation and Directive as far both of them implemented those two EU laws in one legislative national piece. Slovakian approach was to enact complete legal rules which included mostly all provisions from GDPR and the directive on the other hand Austrian approach was to enact only the necessary provisions into the national law where for the rest the GDPR applies directly. Austrian approach was more minimalistic which can be observed in the length of the national Act of Parliaments where Austrian Act consist of 71 articles and Slovakian Act consist of 112 articles.

Generally speaking both of them complied with the duties given by GDPR to the Member states with slight irregularities. As mentioned above Slovak republic has established only one supervisory authority which is not a direct breach of the GDPR but based on the recital EU encourages Member states to have more supervisory authorities on the other hand Austria established two of them. In Austrian Act any legal provisions about the certification cannot be found on the other hand Slovakia has enacted detailed provision about the certification.

Lastly, Austrian was the second fastest country in EU which implemented the relevant national legislation. Slovakia did also the implementation on time and belongs to EU countries which prepared the national legislative before GDPR came into force.

To conclude, both of the countries mostly complied with the GDPR rules and took the responsible approach to implementation of GDPR to their national laws. The approach of implementation is different in the mentioned areas.

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Primary Paper Section: A

Secondary Paper Section: AG

INFLUENCE OF CULTURE ON CORRUPTION WITHIN THE OECD COUNTRIES

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The article results from scientific research conducted at Faculty of Commerce, University of Economics in Bratislava in framework of the VEGA project No. 1/0897/17 (responsible researcher prof. Ing. Peter Baláz, PhD.).

Abstract: The paper asks how culture influences corruption within a country. We focus particularly on the effect of cultural dimensions of individualism, long-term orientation and of indulgence on the corruption perception level, on the sample of OECD member states. Using descriptive, correlation and regression analysis we were able to conclude that countries with low level of individualism show high level of corruption. The long term orientation (vs. short term orientation) did not have a significant statistical impact on the corruption level in the reviewed countries. Finally, empirical evidence did not prove that a high level of indulgence is related to a high level of corruption.

Keywords: Corruption, culture, individualism, long term orientation, indulgence

1 Introduction

With the aim to explain specifics in corruption across countries, various factors influencing corruption have been analyzed in the literature such as the level of economic development, income inequality, size of government or culture. Among scholars, there is a group of those who consider culture to have a major influence on political, social and economic behavior (e.g. often cited Moynihan (2010) wrote: "The central conservative truth is that it is culture, not politics, that determines the success of a society. ..."). The first definition of culture is ascribed to Taylor (1889), according to whom: "Culture or Civilization, taken in its wide ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society." Consequently, many scholars have referred to culture as to the "values, attitudes, beliefs, orientations, and underlying assumptions prevalent among people in a society" (Harrison and Huntington, 2000). Hofstede (1994) emphasized that culture is acquired by individuals by means of their membership to a group of people. He used the word culture in the sense of "the collective programming of the mind which distinguishes the members of one category of people from another. The category of people may be a nation, a region or an ethnic group, women or men ... , old or young ... , a social class, a profession or occupation ... , a type of business, a work organization or part of it ... , or even a family."

Keeping in mind that there are multiple approaches to culture definition, it is not necessary for this study to provide an exhausting overview of them. In the following text we concentrate on the approach of institutionalists and particularly new institutional economic theory. Building on our previous work in which we studied inter alia the quality of institutional environment within economies, in this study we focus on informal institutions of culture and corruption with the aim to determine which cultural factors and in what way they influence the level of corruption, thus also the quality of institutional environment within countries. We concentrate on cultural dimensions of long term orientation, indulgence and individualism because research on their impact on corruption is either missing, or it did not provide clear conclusion so far. It enables us to understand in wide context the role of culture and to suggest effective strategies to combat corruption. Our study helps to clarify that it is important to investigate corruption as having negative impact on institutional environment, manifested by increased transaction costs. In the literature review, we provide an overview of explanations for relationships among institutions, institutional environment, culture and corruption. Using this approach, our research methodology is described and hypotheses are established. Finally, the results, conclusions and implications are presented.

2 Literature review

The institutionalists are those who put culture into relation with institutions. Still, they consider culture to be a much broader concept than institutions (Hamilton, 1957: "... culture is a synthesis - or at least an aggregation - of institutions... The function of each is to set a pattern of behaviour and to fix a zone of tolerance for an activity or complement of activities"). Institutions are cultural constructs (both Hamilton and Veblen emphasize the role of habit and customs in institutions). The relationship between culture and institutions in this meaning was explained by Etounga-Manguelle (2000): "Culture is the mother, institutions are the children."

A different approach to the relationship between culture and institutions is taken by the new institutional economics that distinguishes between formal and informal institutions and organizations (Liška, et al. 2011). Formal institutions are those with a legal basis. Informal institutions can be described as elements of culture such as language, customs, traditions, taboos, codes of conduct or social networks. Institutions change over time, they interact with each other and thus form an institutional environment. Corruption is considered to be an informal institution having a negative impact on the institutional environment. With certain simplification, corruption can be understood as misuse of power over somebody else's property or rights aimed at achieving personal benefit. Corruption should cause very high transaction costs in economics. (Okruhlica, 2013). Liška et al. (2011) describe corruption as a non-market but economic transaction that is a result of a rational calculation of economic entities. Even though it is based on the principle of utility, we believe it has intrinsic features of coercion.

The institutional environment is strongly determined by the level of transaction costs of market entities and the whole society. The theory of transaction costs was elaborated by Coase (1937), according to whom transaction costs include "the marketing costs (that is, the costs of using the price mechanism) and the costs of organizing of different entrepreneurs." These costs arise due to existence of so called governance structures established in the economy to govern the flow of transactions, particularly to prevent deliberate contract breach by one of contractual parties. Examples of these costs are information-searching costs, legal advisory, accounting, controlling, or security costs. The contractual parties have limited rationality in the real world, they are risk-neutral and they are capable of opportunistic behavior towards the other party, inter alia corruption behavior (Williamson, 1990).

In the literature, various factors influencing the level of corruption in the society have been studied. In line with the new institutional economics, the causes of corruption have the form of both formal and informal institutions. For example, Fishman and Miguel (2007) studied parking violation behavior of diplomats in the New York City. They found, that legal enforcement reduces violations, however, diplomats from high corruption level countries had significantly more parking violations, and these differences persisted over time. According to Lipset and Lenz (2000), cultural values (such as strong familial orientation) and institutionalized norms (democracy and rule of law) help in explaining different levels of corruption. A strong evidence was found by Treisman (2000) for the proposition that a number of institutional and cultural factors were influencing the level of corruption.

We expect a lower level of transaction costs in an institutional environment both informally and formally mitigating the risk of unethical behavior, such as unilateral contract breach or corruption. Governance structures should be cheaper in this environment. From this reason we believe it is important to investigate the informal institution of corruption.

There were several attempts to quantify culture in order to input it into statistical models and study its impact. Still, the

institutionalists consider attempts to quantify culture for inconclusive. Possibly the best-known measures of culture are those of Hofstede (2002). Originally, he defined and measured the four national cultural dimensions (power distance, individualism, masculinity, uncertainty avoidance) that were later on expanded by the dimensions of long term versus short term orientation and indulgence versus restraint (for more details see Table 2). Hofstede's dimensions have been used in impressive amount of empirical research. Accomplishments and challenges of 180 empirical studies incorporating Hofstede's measures of culture published in top-tier management and applied psychology journals were reviewed by Kirkman, Lowe, and Gibson (2006).

An alternative set of cultural dimensions was identified by Trompenaars and Hampden-Turner (1994). They used 7 dimensions (dilemmas) to explain cultural differences among nations with respect to relationships of individuals to other individuals, to the time and to natural conditions. They also created national indices for each dimension in order to undertake a cross-national comparison. Different approach to the cross-national investigation of human beliefs and values is represented by the World Values Survey consisting of nation-wide representative surveys conducted in 80 countries, including interviews with almost 400,000 respondents. Since 1981, six waves have been conducted. Questions related to social values, attitudes and stereotypes, organizational membership, corruption etc. An analysis of in this way obtained data made by Inglehart and Welzel asserts that there are two major dimensions of culture: traditional values versus secular-rational values and survival values versus self-expression values. "Any source of quantitative information about culture will have its weaknesses. None of the authors ... claim to have perfectly captured culture and, in fact, all recognise the impossibility of doing so. ... Still, the information they provide helps to make culture more understandable and at least opens the possibility of incorporating more cultural information in empirical and theoretical models.... Quantification of culture is still very early in its ... development" (Adkisson, 2014).

Table 1 provides an overview of empirical cross-country studies that tested influence of national cultural dimensions on corruption based on correlation and regression analyses between selected Hofstede's cultural dimension scores and the Corruption Perception Index score.

Table 1: Empirical studies on relation of culture and corruption under review

Author/s (year of publication)	Sample	Data from	Dimensions tested and results
Husted (1999)	36 countries	Hofstede: 1997 CPI: 1996	<u>power distance (+)</u> <u>individualism</u> <u>masculinity (+)</u> <u>uncertainty avoidance (+)</u>
Getz and Volkema (2001)	50 countries	Hofstede: 1997 CPI: 1997	<u>power distance (+)</u> <u>individualism</u> <u>masculinity</u> <u>uncertainty avoidance (+)</u>
Park (2003)	37 countries	Hofstede 1983	<u>power distance (+)</u> <u>individualism</u> <u>masculinity (+)</u> <u>uncertainty avoidance (+)</u>
Davis and Ruhe (2003)	42 countries	Hofstede: 1980 CPI: 2000	<u>power distance (+)</u> <u>individualism (-)</u> <u>masculinity (+)</u> <u>uncertainty avoidance</u>
Robertson and Watson (2004)	not specified	Hofstede: 1997 CPI: 1999, 2000	<u>masculinity (+)</u> <u>uncertainty avoidance (+)</u>
González-	67	2004	<u>power distance (+)</u>

Author/s (year of publication)	Sample	Data from	Dimensions tested and results
Trejo (2007)	countries		<u>individualism (-)</u> <u>masculinity</u> <u>uncertainty avoidance</u>
Murdoch (2009)	65 countries	Hofstede: 2004 CPI: 2007	<u>power distance (+)</u> <u>individualism (-)</u> <u>masculinity</u> <u>uncertainty avoidance</u>

Explanatory Notes: Underlined dimensions are those for which an influence on corruption perception has been proved; (+) positive relation exists, i.e. the higher is the level of the dimension, the higher is the corruption perception; (-) negative relation exists, i.e. the lower is the level of the dimension, the higher is the corruption perception.

Source: Own processing

As shown in the table 2, relevance was supportable for the four original Hofstede's dimensions. Among these dimensions, the power distance is the one with the strongest correlation with corruption. The influence of dimensions of masculinity and uncertainty avoidance on corruption was proven less strongly as for power distance (for the both dimension four studies found that there is significant relation, three studies, however, were not able to prove it). Finally, the least proven is the influence of individualism on corruption. Authors of only three studies under review found that higher individualism in a country is related to lower corruption. Different results of reviewed studies can be explained by several factors:

- Different size of analyzed samples and possibly high heterogeneity of the samples;
- Scores of analyzed variable of CPI may change over the time indicating an increase or decrease of perceived corruption. Cultural dimensions are assumed to change only very slowly;
- The measurement of the CPI is based on personal attitudes;
- Limitations of Hofstede's approach to measure cultural differences among nations. (Hofstede, 2002).

To understand better limitations of Hofstede's approach, we compared the results of presented empirical studies with two cross-national empirical studies that developed cultural dimensions using the World Value Survey. In both studies, these cultural dimensions were related to the CPI in order to investigate their impact on corruption. Lipset and Lenz (2000) used data from the World Values Survey 1990, and the CPI values from 1998. They asserted that countries with high levels of achievement orientation and low access to means, as well as countries with strong familial ties (collectivism by Hofstede), are prone to suffer from corruption. Akbar and Vujčić (2014) based their analyses on the World Values Surveys 1999-2004 and 2005-2009, as well as the CPI for 2003 and 2006. They found that cultures with strong hierarchy and fatalism (power distance by Hofstede) are positively correlated with corruption whereas egalitarian cultures correlate with lower corruption. Thus, the findings of both studies support those presented in table 2.

3 Methods

Being aware of criticism of Hofstede's framework, we still use in our study the most recent quantification of his national cultural dimensions (The Hofstede Centre, 2017a) as a widely accepted study of cultures across nations (see Kirkman, Lowe, and Gibson, 2006). We use culture as an independent or explanatory variable, even though some authors emphasize that, particularly in the long run, it is influenced by other factors such as geography, climate, politics or history.

Table 2 Description of independent variables (IV) and dependent variable (DV)

Variable	Description
Power Distance (IV)	It assesses the distribution of one member's impact on the whole society. It represents the degree to which the members of a society with lower influence accept an uneven distribution of influence in society. In the cultural environment with low value of power distance, people try to reduce the heterogeneity of the impact distribution. The dimension ranges from 0 (low power distance) to 100 (high power distance).
Individualism (IV)	Members of society in individualistic cultures are concerned about their self-interest. In countries with high collectivism the loyalty to all members of a society prevails. The dimension ranges from 0 (Collectivism) to 100 (Individualism).
Masculinity (IV)	This dimension evaluates whether a society is dominated by masculine (ambition, courage, assertiveness, etc.) or feminine (co-operation, modesty and care for the lifestyle quality) patterns of behaviour. The dimension ranges from 0 (Femininity) to 100 (Masculinity).
Uncertainty Avoidance (IV)	Expresses the attitude towards the future, its control and the feeling of anxiety that is associated with uncertainty. Higher values indicate more rigid patterns of behaviour, formal and informal standards. The dimension ranges from 0 (low uncertainty avoidance) to 100 (high uncertainty avoidance).
Long Term Orientation (IV)	A society with a low score respects tradition, custom. It is more averse to social change. On the contrary, a society with higher score is more pragmatic towards the future. A modern education system is being implemented as a form of preparation for the future. The dimension ranges from 0 (short-term orientation) to 100 (long term orientation).
Indulgence (IV)	Indulgent societies are more open and more ready to meet their needs, including the need of having fun. Restraint societies regulate their behaviour by stricter standards and norms. The dimension ranges from 0 (restraint societies) to 100 (indulgent societies).
CPI2016 (DV)	The Corruption Perceptions Index (CPI) developed by the Transparency International quantifies the level of corruption in the monitored countries through subjective evaluation by experts. Although the index is oriented towards the public sector, we assume that the private sector is exposed to a similar level of corruption as an informal institution in a particular institutional environment. Index scores range from 1 to 100 where the higher the score represents the less corruption perception.

Source: Own processing by The Hofstede Centre (2017b), Zorkóciová (2016) and Transparency International (2016a).

As indicated in the previous text, the influence of several cultural dimensions on the level of corruption is accepted by some scholars. However, for the rest of them, the evidence is either missing (long term orientation, indulgence) or is not clear (individualism). Therefore, we propose three hypotheses.

Husted (1999) and González-Trejo (2007) assumed that a higher level of individualism should lead to a lower corruption rate in the country. The same assumption was made by Jha and Panda (2017). To express the value of individualism, they used an index of historical prevalence of infectious diseases and a measure of genetic distance between the populations in a country from that in the United States. They found that more individualistic countries have lower levels of corruption perception. This can be explained by the fact that members of

collectivistic societies are likely to be influenced by other members of the family or society. However, other empirical studies did not prove this relationship. From this reason we made the following hypothesis which we are verifying using the current data on homogeneous sample of OECD member countries:

Hypothesis 1: Countries with low level of individualism show high level of corruption.

The verification of the influence of both the long term orientation and indulgence on corruption has been, so-far, excluded by authors from the analyses due to the limited number of available observations (Getz and Volkema, 2001; Murdoch, 2009) or due to assumption of absence of any relationship between these variables. According to Husted (1999): "Although one might associate a long-term orientation with a lesser likelihood to participate in corrupt transactions, upon examining the individual elements of the two poles, it is difficult to see how one set of values or the other would have any impact on corrupt behaviour. Should stability (short-term orientation) have a different impact on corruption than persistence (long-term orientation)? Values at both ends of this dimension could either foster or reduce corruption." Therefore, we propose the second hypothesis:

Hypothesis 2: The cultural dimension of long term orientation (v. short term orientation) does not have a significant statistical impact on the corruption level in the country.

Hofstede (2015) described a society with a high value of indulgence as the one in which it is important to have friends. Ethical and moral discipline is relaxed and crime rate is high. On the contrary, within restraint nations, strict moral discipline and low crime rate is accompanied by a larger police force. The description of the cultural dimension of indulgence leads us to the third hypothesis:

Hypothesis 3: Countries with high level of indulgence show high level of corruption.

We focused on 35 countries grouped in The Organization for Economic Co-operation and Development (OECD) in order to obtain a more homogenous sample of observations than previous studies. To verify our hypotheses, we used quantitative statistical methods, namely the descriptive, correlation and multiple regression analysis. The results were interpreted in accordance with Pacáková, et al. (2009) and Lukáčik, Lukáčiková, Szomolányi (2011). The estimated linear econometric equation and model testing were calculated in Dell Statistica. The linear multiregional equation with multiple variables is formulated as:

$$\text{CPI2016} = \text{Intercept} + \beta_1 * \text{Power Distance} + \beta_2 * \text{Individualism} + \beta_3 * \text{Masculinity} + \beta_4 * \text{Uncertainty Avoidance} + \beta_5 * \text{Long Term Orientation} + \beta_6 * \text{Indulgence} + \varepsilon$$

4 Results

We produced the descriptive statistics as presented in Table 3. We analysed 35 countries for all variables except for indulgence, for which the observation for Israel is missing. For this dimension, we analyzed only 34 countries. The average value of the CPI in OECD member countries for the year 2016 was at 68.6. This index was included into the model as a dependent variable. Cultural dimensions were used as independent variables. Most of them (except for power distance and long term orientation) produced negative left-skewed asymmetrical distribution of countries (there are more countries with lower values of variables than the average). A negative kurtosis was determined for all variables except for power distance (the set of resulting values has lower kurtosis than the normal distribution).

Table 3: Descriptive statistics

	Mean	Std. Err.	Skewness	Kurtosis	Count (N)
CPI2016	68.63	15.72	-0.56	-0.49	35
Power Distance	46.49	19.82	0.44	0.17	35
Individualism	60.46	19.81	-0.58	-0.46	35
Masculinity	48.51	25.41	-0.03	-0.68	35
Uncertainty Avoidance	67.23	21.10	-0.29	-0.92	35
Long Term Orientation	52.14	21.31	0.39	-0.85	35
Indulgence	52.26	19.56	-0.14	-0.48	34

Source: Own processing on The Hofstede Centre (2017a); Transparency International (2016b).

Table 4 shows a correlation matrix of defined variables at a probability level greater than 90 % ($p < 0.10000$). Using correlation coefficients, we can estimate the degree of dependence between variables. A positive correlation coefficient, which indicates direct proportionality, was calculated for Individualism (medium-strong dependence) and Indulgence (weak dependence). Consequently, countries with higher value of individualism show higher value of CPI, i. e. lower level of perceived corruption. Power distance and Uncertainty avoidance showed an indirect, medium-strong relationship with the CPI. The higher value of these variables indicates more corruption perception in the country. The correlation coefficient was statistically insignificant for the long term orientation. This cultural dimension has been, so far, excluded from empirical studies due to the lack of observations and therefore its impact on culture is poorly understood.

Table 4: Correlation matrix

Correlations (Dataset OECD) <i>Italic correlations are significant at $p < 0.10000$</i>	
	CPI2016
<i>Power Distance</i>	$r = -0.6765$ $N = 35$ $p = 0.000$
<i>Individualism</i>	$r = 0.5560$ $N = 35$ $p = 0.001$
<i>Masculinity</i>	$r = -0.2957$ $N = 35$ $p = 0.085$
<i>Uncertainty Avoidance</i>	$r = -0.6231$ $N = 35$ $p = 0.000$
<i>Long Term Orientation</i>	$r = -0.0742$ $N = 35$ $p = 0.672$
<i>Indulgence</i>	$r = 0.3926$ $N = 34$ $p = 0.022$

Source: Own processing on The Hofstede Centre (2017a); Transparency International (2016b).

Using all Hofstede's dimensions, we have compiled a multiple regression model in Table 5. Hence we were able to achieve a better model specification.

Table 5: Multiple regression linear analysis

Regression Summary for Dependent Variable: CPI2016 (Dataset OECD)				
N=34	R= 0,81321399 R ² = 0,66131699 Adjusted R ² = 0,58605410			
	F(6,27)=8,7868 $p < 0,00002$ Std. Error of estimate: 10,254			
	b	Std. Err. (b)	t(27)	p-value
<i>Intercept</i>	63.12360	19.17797	3.29146	0.002780
<i>Power Distance</i>	-0.35092	0.12893	-2.72189	0.011227
<i>Individualism</i>	0.20054	0.12829	1.56313	0.129668
<i>Masculinity</i>	-0.14182	0.07764	-1.82666	0.078828
<i>Uncertainty Avoidance</i>	-0.06750	0.13065	-0.51664	0.609611
<i>Long Term Orientation</i>	0.18257	0.10212	1.78780	0.085039
<i>Indulgence</i>	0.22842	0.12012	1.90166	0.067936

Source: Own processing on The Hofstede Centre (2017a); Transparency International (2016b).

Based on the coefficient of determination (R²), the model explains 66.13 % of input data. According to F-statistics, the model is statistically significant with 99 % probability ($p < 0.00002$). With at least 90 % probability, the estimations of the intercept and of parameters of power distance, masculinity, long term orientation and indulgence were statistically significant. According to the T-statistics, the statistical significance of these estimations was, however, marginal for almost all of parameters.

If the long term orientation score increases by 10 units, the value of perceived corruption index will grow by 1.8 units. This is reflected in the corruption perception level decrease. Similarly, if the value of indulgence increases by 10 units, the modelled CPI will increase by 2.3 units. The regression model returned results similar to the correlation analysis, but the regression analysis indicated a statistical significance for the long term orientation with 90 % probability. Moreover, contrary to the correlation analysis, individualism and uncertainty avoidance were not estimated with statistical significance when using regression analysis.

The results can be summarized as follows in the table 6.

Table 6: Summary of results

Dimension	Hypothesis*	Corr. Analysis*	Regr. Analysis*	Conclusion
Power Distance		+	+	
Individualism	1(-)	-	0	Accepted
Masculinity		+	+	
Uncertainty Avoidance		+	0	
Long Term Orientation	2(0)	0		Accepted
Indulgence	3(+)	-	-	Rejected

Explanatory Notes: * - indicates an indirect proportionality to corruption (i.e. direct proportionality to CPI), + indicates a direct proportionality to corruption (i.e. indirect proportionality to CPI), 0 indicates statistically insignificant dependence

Source: Own processing

5 Conclusions

The aim of this study was to determine which cultural factors and in what way influence the level of corruption in the economy. Existing literature provides insight on how corruption is influenced by particularly power distance, but also by masculinity and uncertainty avoidance. In our analysis we, therefore, focus on the cultural dimensions of individualism, long term orientation and indulgence.

We accepted hypothesis 1 according to which countries with low level of individualism show high level of corruption. The correlation coefficient proved that medium-strong direct dependence exists between the variables of individualism and CPI.

We also accept the second hypothesis proposing that the cultural dimension of long term orientation (v. short term orientation) does not have a significant statistical impact on the corruption level in the country. Although, on the basis of regression analysis we observed a slight decrease in corruption in countries with higher level of long term orientation, the statistical significance of this estimation was very marginal. Therefore, there is a need for further research in this area based on either different sample of countries, or future data.

The third hypothesis should be rejected. Despite of theoretically grounded expectation that countries with high level of indulgence show high level of corruption the correlation and particularly the regression analyses showed positive correlation between variables of indulgence and CPI. It means that countries with higher level of indulgence are less corrupt.

Results of our analysis lead us to conclusion that the cultural dimensions of individualism and indulgence have impact on corruption perception within the OECD countries. Countries with high level of both individualism and indulgence show low level of corruption. This enables us to suggest that, from a long term perspective, it is possible to face corruption by influencing culture. It is generally assumed that national culture may change only very slowly. For example, Akanji (2017) considers a cultural change for possible, even though difficult. In our opinion, the decisive role in this change should be played by education. This conclusion is in line with Casson (2006) according to whom values and beliefs are memorized by individuals, and are transmitted to the next generation through parenting and education. Moreover, the study of Lv (2017) showed that nations should invest in education and human skills to reap the benefits of lower corruption levels.

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Primary Paper Section: A

Secondary Paper Section: AH, AO

TEACHERS AND ICT TOOLS: TYPOLOGY OF TEACHERS IN TERMS OF THEIR APPROACHES TO AND VIEWS ON MODERN TECHNOLOGIES

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This article was created with the financial support from the project of the "Grant Fund of the Dean" of the Faculty of Education, Palacký University Olomouc, in the framework of the project entitled "Attitudes of Pupils and Teachers toward Educational Content in the Subject of Informatics at Primary and Secondary Schools".

Abstract: Is it possible to categorize teachers by their approach to modern technology? Are there groups of teachers who use modern technology uncritically? These are some of the questions which the submitted paper attempts to find the answer.

The necessary research data were gathered through a research questionnaire, which was distributed to primary and secondary schools' teachers, and included both closed and open questions. On the basis of the assessment of the results it can be stated that according to their answers to the questionnaire items, it is possible to divide the teaching staff into five relatively separate groups, and there is neither a group that would accept ICT tools uncritically (adore) nor another one which would radically refuse (resist) them.

Keywords: ICT tools, teacher competencies, modernisation of education.

1 Introduction

The use of ICT¹ tools in training by the teachers is at present a very much discussed topic, which often oscillates between two 'extremes'. One refers to the uncritical acceptance and involvement of ICT tools in teaching, even in the areas where they could be avoided, while the other group comprises teachers who refuse to use these tools even in those activities and situations which explicitly require them. Uncritical reception or adoration refers to one 'extreme', and refusal or resistance refers to the opposite 'extreme'. A similar categorization can be found, for example, in more than 20 years' old works of E. Rogers, who calls the representatives of the first 'extreme' innovators or enthusiasts and refers to the members of the second "extreme" group as to skeptics or laggards (Rogers, 1995, 261-263). For the sake of completeness, Rogers's taxonomy has a total of 5 degrees (enthusiasts - innovators, early adopters - visionaries, early majority - pragmatists, late majority - conservatives and laggards - sceptics). Innovators share their enthusiasm for news especially with people of the same focus all over the world and their domain is communication. They are not afraid of the risks associated with the acquisition of innovation. They also dispose of considerable resources to cover potential losses from adopting unprofitable innovations. They enjoy trying new things, and they are not afraid of potential failure. As they are often not accepted by their environment, they establish relationships with other innovators. On the contrary, laggards are generally the last ones to adopt innovation and acquire it. They are focused on the past, and prefer traditional values and solutions. Since they are often isolated from their peers, they represent the opposite of the cosmopolitan focus of enthusiasts. Laggards are distrustful of innovation, often accepting innovation only when a new idea or innovation in the same area arises (Rogers, 1995, pp. 261-263).

The process of implementation of ICT tools into the educational process is very complex and complicated. This was the reason why there emerged an effort to make this issue easier to pedagogues and to help them define it as precisely as possible. An idea of how should the technological innovations be introduced in the teaching was presented in 2004 in a research by OECD in a framework of the ACOT (Apple Classrooms of Tomorrow) project. At that time, a so-called *diffusion model of a pedagogue* was published while it quite simply and comprehensibly defines individual stages of the process of development of ICT tools' acquisition for educational purposes from the stage of absolute non-employment to the stage of a

confident employment of the technology for a preparation of study materials, teaching and presentation of information within the teaching (Mandinach & Cline, 2004). This model contains four stages of diffusion in the work of a teacher, and it is a base of many theoretical and empirical treatises even today. *1st stage – Survival* - the first stage is closely connected to the introduction of new qualifying requirements for the performance of pedagogue's profession which, in most cases, requires the need of knowledge of the work with ICT tools (Brdička, 2010). *2nd stage – Mastery* - amidst the rising level of knowledge of the work with ICT tools, the pedagogue enters the stage of mastery in which they is able to control tools at a common user level (communication means, search of information) (Mandinach & Cline, 2004). *3rd stage – Impact* - at this stage, the ICT tools change from the aim of education to the means employed in the teaching process (Brdička, 2010). *4th stage – Innovation* - far from every pedagogue achieve this final stage of achievement of ICT tools. A pedagogue who achieved a stage of innovation is now able to independently restructure the curriculum, educational activities and work methods (Mandinach & Cline, 2004).

However, based on our experience and on the outcomes of the research conducted, the situation among current pedagogical staff is not as clear as claimed by the above mentioned theories. Teachers are frequently rather 'pushed' to the use of innovations, that is to say modern ICT tools, by many external conditions and stimuli. The first stimulus are the pupils themselves, such as the concept of digital natives (Prensky, 2009), who are constantly increasing their interest in ICT tools and thus influencing their teacher's work. As an another external influence we can regard the pressure of firms, which often present new technologies and thus attract teachers' interest in them without the former being constantly prepared or at least informed about the possibilities of a meaningful use of such technologies in education. More external influences could certainly be identified, however, it is necessary to consider internal obstacles and barriers, which are of no less importance, too.

2 ICT tools and teacher competencies

All the presented facts place new demands on teachers who have to be prepared to work with modern ICT tools and create appropriate educational materials for such tuition. This need stems not only from the practice but also from the necessity to accept modern paradigms of teaching and it perceives the importance of student's inner conditions of learning as well as their contact or interaction with the environment. That is why in this modern teaching paradigm new demands are made on a teacher and even though the teachers do not necessarily need to be ICT experts they should be able to make use of them in tuition where their role should be, above all, students' advisor (Jonassen et al., 2003). We can define these demands from the TPCK model (Technological Pedagogical Content Knowledge) by L. Shulman (1986), in Czech – technological-didactic knowledge of content, according to Zounek and Šedřová (2009) or Janík (2005) who was further elaborated by P. Mishra and M. Koehler (Mishra, Koehler, 2006). This model uses three dimensions: (1) pedagogical dimension; (2) content dimension; (3) and technological dimension that all accept the fact that teaching is a complex activity requiring various types of knowledge (understanding, skills and attitudes), "and understanding its principle means to penetrate into the complex net of their inter-relationships" (Šimonová et al., 2010).

According to Brdička (B. Brdička, in Sojka, Rambousek eds., 2009), integration of ICT in the tuition is possible only based on a real modification of teaching processes. Newly outlined content that educates teachers is composed of, according to above given TPCK, four parts. The first one being the earlier mentioned didactic knowledge of content (Pedagogical Content Knowledge – PCK) that stems from the original Schulman's

¹ By ICT tools technical devices such as interactive whiteboards, tablets, computers, etc., but also software such as tutorials, learning websites, e-learning portals, electronic learning materials and e-books are meant.

concept. This concept, according to Mishra and Koehler, contains knowledge how to approach the educational content and organise it in order to be transmitted as effectively as possible. The second part deals with the interconnection of teaching and technologies (Mishra, Koehler, 2006). As a result, technological knowledge of the content is formed there (Technological Content Knowledge – TCK), to be more specific, this knowledge describes which technologies are appropriate for the particular educational content. This means that the principle is not only in the knowledge of the taught subject or issue, but also in the way the subject is adjusted using the ICT. The next part connects the field of didactic knowledge with the technological knowledge (Mishra, Koehler, 2006), which results in a new educational field, so called technical-didactic knowledge (Technological Pedagogical Knowledge – TPK). This field represents not only the knowledge of the existence of various technologies usable in education, but also the knowledge of the fact that these technologies have various tools and possibilities applicable in tuition. This means that it is necessary for the teacher not only to know of the various technologies, but also be familiar with their possibilities and limits that can be brought in the tuition. The last part is an intersection of the three above mentioned fields. Mishra and Koehler (2008) talk about so called technological-didactic knowledge of the content (Technological Pedagogical Content Knowledge – TPACK) made by a new form extending significantly further than its three parts. Technological-didactic knowledge of the content is according to earlier mentioned authors (Mishra, Koehler, 2006, 2008) the foundation of effective education that requires from the teacher, above all, understanding the usage of technologies. *“Only the combination of all necessary knowledge (technological-didactic-subject) makes the teacher a unique and irreplaceable master of their field who is able to help transfer learning towards higher forms in the current world conditions”* (Brdička, 2009).

Once again, we have to state here that the required technical-didactic knowledge is far from being achieved by all teachers, as some teachers do not dispose of various key competencies necessary for a meaningful involvement of ICT tools into training. The reasons for this shall be sought not only in the lack of these tools, but also in some of the internal influences which prevent the necessary competences of teachers in this field from further development.

Therefore, we will try to find an answer to the question mentioned in the title of this article, and to find out how teachers perceive the positive or negative aspects of the use of ICT tools in their teaching. Undoubtedly, it is not possible to expect that all teachers and pedagogues accept and use ICT tools totally uncritically, and, on the other hand, it is certain that the latter are not totally rejected by all teachers either. There may exist barriers which prevent educators from using or involving ICT tools in their teaching. These barriers may be internal (for example fear and unwillingness to use ICT tools, and so on) as well as external (for example little support from school management, lack of ICT tools, and so on).

3 Aim and methodology of the research carried out

The aim of the research carried out by means of quantitative research methods was to find the response to the established research problem of how teachers of primary and secondary schools deal with the rapid development of ICT tools and the need to implement them in education. We also looked at the extent to which teachers are able to transfer this development to teaching, and at the related offer of training which would enable teachers to implement this transfer. Moreover, we tried to identify the main causes which prevent teachers from using ICT in teaching. Finally, we compiled this set of sub-questions into an overall summary of the essence of the research problem, which is: *how do teachers respond to the rapid development of ICT tools, how do they reflect it in their teaching and do they lack support and help for this reflection?*

We also focused on determining whether it would be possible to classify teaching staff according to their answers into separate

groups, which would correspond to their interest or lack of interest in using ICT tools in teaching. In this respect, we followed the above-mentioned taxonomy of E. Rogers (Rogers, 1995, pp. 261-263) operating with five categories, differentiated by the degree of interest and the level of use of ICT tools by a particular teacher in the process of teaching. Our aim was to verify whether this more than 20-year-old taxonomy still reflects the current situation (in terms of number of categories) and whether or not the extremes (innovator versus laggard) have remained in existence. Based on these considerations, we defined the following research assumptions: *is there a group of pedagogical workers who uncritically accept (adore) the use of ICT tools in the teaching which they implement, and/or, on the other hand, a group which fundamentally rejects (resists) such use?*

Our aim was therefore to identify within the framework of the research sample individual groups of respondents who showed the same or similar level of evaluation of the particular questionnaire items, to describe their characteristics, and possibly to correct the negative impact of some groups of respondents on the results of the research survey. The aim was achieved using the method of cluster analysis, which in this case analyzed clusters within the set of respondents to determine whether there were groups of pedagogical staff who showed a similar way of evaluating individual questionnaire items.

4 Methods of the research data collection and processing

As the main means for the data collection (necessary for the realization of the research), the questionnaire was used. The questionnaire belongs among indirect – investigational methods – in the structure of research methods classification. The questionnaire can be characterized as a measuring means which we can research *the people’s opinions on individual phenomena* (Chráška & Kočvarová, 2015). The research phenomena might be (from the point of an individual – respondent) related to either external processes or internal processes. For the needs of the research, the structured questionnaire (Gavora, 2010) was constructed based on the research questions and hypotheses delimited above.

The questionnaire contained closed-end questions while possible responses were offered, semi-closed-end questions with a scale of possible responses (a four-step scale was used), and open-ended questions which enabled the respondents to describe the variant state of observed phenomena. In order to ensure the understandability of individual questions of the questionnaire, the questionnaire itself was provided with an explaining text which delimited individual terms used. In order to discover the size of individual groups of respondents (who responded in the same way), basic descriptive statistics were used as well as their visualization via graphs. Additionally, these results were subjected to an analysis while the level of significance of the responses of the individual groups of respondents was studied. These groups of respondents were divided according to their significant characteristics (sex, age, length of professional experience, etc.). In order to perform this verification, we used parametric Student’s t-test which compares the means of one variable in two groups (Chráška & Kočvarová, 2015).

Eventually, the method of cluster and factor analysis was applied, which ranks among methods aimed at exploring similarities of multidimensional objects, that is to say objects with a larger number of variables, and their classification into groups, or clusters. It is particularly applicable where objects show a natural tendency to group (as it originated as a taxonomic method), but can be applied in other areas, too (Meloun & Miltky, 2006, p. 341). The above mentioned facts were used in the analysis of the obtained research sample, which was consequently divided into groups according to the similarity of answers to individual questionnaire items. Based on this division, it was possible to identify individual groups of respondents, responding to the questions asked similarly or identically. We used statistical system Statistica 11 for all calculations and visualizations (Klímeck, Stříž & Kasal, 2009).

The constructed research questionnaire was distributed among 850 pedagogical workers of basic and secondary schools. In total, 260 pedagogical workers filled-in the constructed questionnaire, therefore, the response rate was 30.6 per cent which might be a proof that the solved issue is topical and contributing. The research sample consisted of members of teaching staff of 35 schools in total while these schools are based in three regions of the Czech Republic (Olomouc region, Moravian-Silesian region and Zlín region) while 8 of them were respondents from pre-primary schools, 165 respondents were from basic schools, and 81 were based in secondary schools, the rest of 6 respondents expressed their affiliation to "other" type of school. The research sample is described in Table 1.

Table 1. Research sample structure

Characteristic	Group	Frequency in %	Overall frequency
Sex	Male	25.4%	260
	Female	74.6%	
Length of professional experience	less than 5 years	13.5%	260
	5-10 years	12.7%	
	10-15 years	13.8%	
	15-20 years	18.1%	
	more than 20 years	41.9%	
Type of school	pre-primary school	3.1%	260
	basic school	63.5%	
	secondary school	33.5%	
	less than 100 pupils	5.4%	
Size of school	100-200 pupils	21.9%	260
	200-500 pupils	46.2%	
	500-1000 pupils	26.5%	

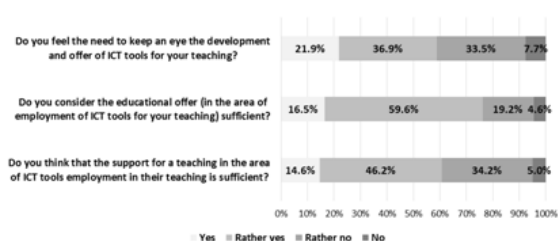
5 Selected results of the research

Hereinafter, some partial results of the research conducted to find out how primary and secondary school teachers deal with the rapid development of ICT tools and the need to implement them in education are stated. The aim of the partial outputs summary is not to provide an exhaustive description of all the results achieved but to familiarize the reader with the overall context of the research conducted. Main focus of the presented research is therefore to be seen in the overall analysis of the teachers' answers processed by cluster and factor analyses, which we applied in order to attempt to extract individual groups of teachers.

5.1 Determination of the perception of ICT by teachers

The first area of study focused on teachers' perception of ICT. Questionnaire items, such as: "Do you feel the need to keep an eye on the development and the offer of ICT tools for your teaching?", "Do you consider the educational offer in the area of ICT tools for your teaching sufficient?" and "Do you think that the support for teaching in the area of ICT tools employment is sufficient?" The purpose of the aforementioned questionnaire items was to find out whether the teachers of the monitored schools are following the current offer of ICT tools designed to support their teaching and are thus aware of current trends in the development and related supply of the former.

We believe that monitoring the development and the supply of ICT tools available for teaching is an important prerequisite for their adequate and meaningful use in the educational process, although this development is sometimes conditioned by the business interests of particular companies rather than by the practical applicability and benefits of these innovations for teaching itself. Nevertheless, the knowledge of the current offer is an important factor which can help teachers to assess the benefits and the necessity of deploying the ICT tools offered for teaching. An overview of the answers to these questions is summarized in graph 1 below.



Graph 1 The level of monitoring the development and supply of ICT tools by the teachers

As shown in Graph 1 above, more than 50% of teachers do monitor the current offer and development of ICT tools available and applicable in their teaching (see the Yes and Rather Yes answers), and only 7.7% of them do not feel such need (see the No answers). Furthermore, it can be observed that an overwhelming majority of teachers - 76.1% in total, consider the educational offer pertaining to ICT usage in teaching to be sufficient (see the Yes and Rather yes answers). Only 4.6% of teachers perceive this offer as being totally inadequate and 19.2% as rather inadequate. Finally, only 14.6% of teachers regard the support which teachers are provided with in the use of ICT tools as sufficient, and another 46.2% claimed that they considered it rather sufficient. Surprisingly, only 5.0% of teachers stated that they perceived the support provided in this area as totally inadequate, and 34.2% characterized it as rather inadequate.

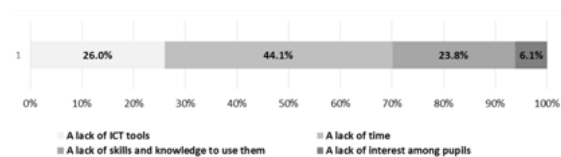
Additionally, we can state that on the basis of the analysis carried out by means of Student's T-Test, the level of significance $p > 0.05$ was reached for only two significant signs (gender and school size) out of four. It is possible to deduce from this result that the group of secondary school teachers with more than 200 pupils shows a higher interest in monitoring the development and the supply of ICT tools. Therefore, it can be stated that *the level of teachers' monitoring the development and the supply of ICT tools is statistically significantly higher with women with a shorter working experience who teach at secondary schools with more than 200 pupils.*

5.2 Determination of the interest in the use of ICT tools by teachers

Further area of study focused on identifying how teachers monitor ICT development, as well as major obstacles to their use. This area was explored using the following questionnaire items: "How do you monitor the development of ICT tools convenient for your teaching?", "How often do you participate in ICT training courses / tutorials / workshops?", and "What do you consider the biggest obstacle to a wider usage of ICT in your teaching?"

The aim of the aforementioned questionnaire items was to find out whether teachers have enough opportunities for further training in the use of ICT tools in their teaching, how they respond to this offer, and whether they use it. Furthermore, we attempted to identify most frequently used information channels and resources aimed at monitoring innovation and development in the field of ICT teaching tools. Finally, several questionnaire items aimed at formulating the overall attitude of teachers to the use of ICT tools in their teaching, including the identification of the main obstacles determining such teaching. Based on the assessment of the data obtained, it can be stated that the most widely used sources with respect to the monitoring of the development and the offer of ICT tools convenient for teaching are the Internet (48.8%) and educational events (25.9%). Only 19.8% of teachers stated that they did not use any information source to monitor the development and supply of ICT tools, which corresponds to the above declared need to monitor such development, as outlined in Figure 1, where more than 40% of respondents stated that they did not feel or rather did not feel such need.

Furthermore, it was possible to conclude that as regards educational events, teachers attend them usually only once a year (50%), while a significant proportion (38.1%) of teachers do not participate in educational events at all. Only a small proportion of teachers, a total of 12.0%, attend educational events focused on the use of ICT in education two or more times per year, a result which is rather surprising. However, with respect to the incoherent concept of Continuing education of pedagogical staff, and the absence of a finalized and binding career system of teachers, such result becomes more understandable.



Graph 2 Identification of obstacles preventing a wider use of ICT tools in teaching

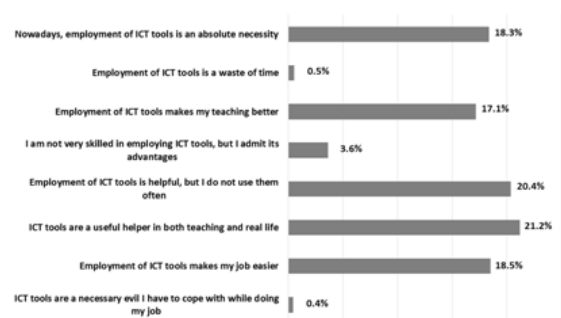
Based on the analysis of the data acquired in the field of identifying the obstacles preventing a wider use of ICT tools in teaching (see graph 2 above), it can be said that the most frequently mentioned obstacle is a lack of time (44.1% of respondents), a lack of suitable ICT tools (26.0% of respondents), and a lack of relevant knowledge and skills (23.8% of respondents). Only 6.1% of respondents claimed that it was also a lack of interest on the side of pupils which prevented a wider use of ICT tools, which, however, can be due to the type or the content of the teaching of the latter.

The aforementioned results were again subjected to an analysis aimed at detecting the possible dependence of the results on the significant signs, i. e. gender, length of practice, type and size of the school, etc., realized via Student's t-test. Since the observed value of $p < 0.05$ was reached in three of the four monitored signs (with the exception of gender), we can state with a relatively high probability with respect to the probability limit that *the frequency of teachers' opinions on the obstacles preventing the use of ICT tools in their teaching is relatively higher for women with a shorter period of practice, who work at pre-schools and primary schools with fewer than 200 pupils.*

5.3 Determination of the attitude of teachers to ICT tools

Final area of study focused on identifying the overall attitude of teachers to ICT tools. The questionnaire item used for this purpose was formulated as it follows, that is to say "How would you characterize your relationship / attitude to ICT tools?"

The use of ICT tools in education is, according to some authors, a significant impulse for the development of both pedagogical practice and theory (eg Zounek, 2015, Brdička, 2012, Jonnasen, 2003, Mishra & Koehler, 2006). However, the question is whether this need is perceived in practice at all, whether teachers feel this need equally, and whether ICT are perceived by teachers positively as a helper to their difficult work. A summary of respondents' answers is apparent from Graph 3 below.



Graph 3 Overall attitude of teachers to ICT tools

Based on the results presented in the graph, it can be stated that only 0.9% of teachers declared rejection of the use of ICT tools in teaching (0.5% of respondents described the use of ICT tools as an unnecessary waste of time, and 0.4% of respondents characterized ICT tools as necessary evil). Majority of teachers, 56.8%, hold the opposite view, and they welcome the use of ICT tools in their teaching (18.5% of respondents said that ICT tools make it easier for them to work, 21.2% of respondents claimed that ICT tools are a suitable tool for teaching, and 17.1% of respondents believe that the use of ICT tools improves teaching). Obviously, only a small part of teachers utterly refuse the use of ICT tools in teaching, and the question remains what exactly discourages these teachers from using the latter.

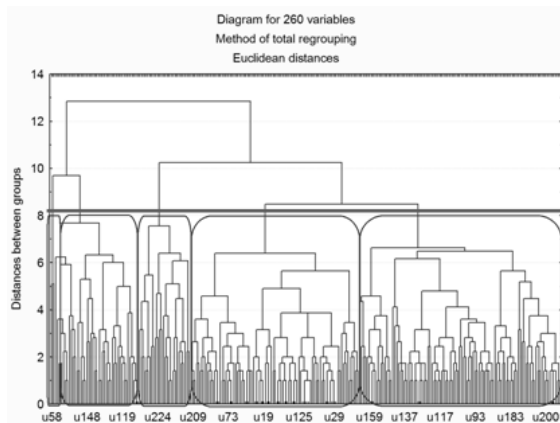
These results were also subjected to an analysis aimed at detecting the possible dependence of the results on the significant signs (gender, length of practice, type and size of the school). Student's t-test was applied. Since the observed value of $p > 0.05$ is reached for all four signs monitored, it is possible to say with high probability that *the relationship and attitude of teachers to the use of ICT tools in teaching is identical for men and women, including the length of practice, and type and size of the school.*

Overall, it is possible to summarize the results of the aforementioned analyzes and their outcomes by concluding that ICT tools are not neglected or on a large scale refused by teachers. However, for the sake of objectivity, it is necessary to emphasize that it is not to be expected that all teachers and educators accept and use ICT tools uncritically, and, on the other hand, it is equally impossible to expect total rejection of ICT tools by all teachers either. For this reason, a further analysis was carried out using multidimensional statistical methods, which aimed to identify and describe individual groups of respondents, responding to the questions asked similarly or identically.

6 Adoration or resistance – what is reality?

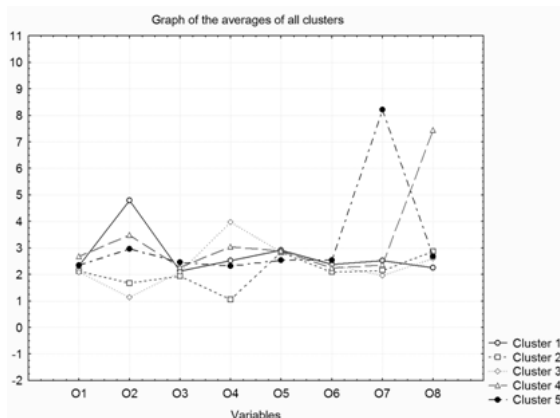
To be able to answer the question raised in the title of the chapter, another statistical evaluation was carried out, using the statistical method of cluster analysis (Pošík, 2008, p. 17). This method is applicable where a set of objects (affirmations, respondents, etc.) can be divided into several relatively homogeneous groups, which would, for example, facilitate further analysis. Based on the aforementioned facts and on the outputs of the research, there was a presumption that there was practically no group of teachers who would deliberately refuse to use ICT tools in education and who thus responded to all questionnaire items with a low score rate.

Consequently, our aim was to identify individual groups of respondents in the research sample who showed the same or similar level of evaluation of the individual questionnaire items, to describe their characteristics, and possibly to correct the negative impact of some groups of respondents on the results of the research survey. This was achieved using cluster analysis, which in this case analyzed clusters in the set of respondents to determine whether there were groups of teachers who showed similar way of evaluating individual questionnaire items. The result of this analysis is represented by Graph 4.



Graph 4 Cluster analysis of evaluation of individual questionnaire questions by teachers

As illustrates Graph 4, it was possible to classify teachers according to the similarity of their evaluation of the individual questionnaire items into 5 relatively independent groups, differentiated according to the distance of the connection at the level around the value of 8. However, none of these groups showed neither higher nor lower rate of evaluation of individual questionnaire items. Therefore it was not possible to identify a cluster of possible "opponents" of using ICT tools in education. To prove with certainty that there is no teacher group that clearly rejects all activities related to the implementation of ICT tools in education, we used the k-diameter method, which aimed to identify and describe the characteristics of individual groups of respondents. For this reason, we performed a further k-diameter cluster analysis, which divided the surveyed sample into 5 groups, as shown in Graph 5.



Graph 5 Classification of the respondents based on similar rating of questionnaire items

As is evident from Chart 5, our assumption was confirmed that the group of respondents is subdivided into five relatively separate groups according to the assessment of individual questionnaire items. Furthermore, it is noticeable from the graph that none of the respondents' groups showed a significantly higher or lower rating in all questionnaire items than other groups. Although there does exist one group (indicated in the graph as Cluster 2), which has lower scores in most items, however, in some items (Q2 - "Do you feel the need to follow the development and supply of ICT tools for your teaching?" and/or Q5 - "What are the most common obstacles to the use of ICT tools in your teaching?"), this group provides higher rating than another group. More obvious are significant differences in the evaluation of the items between different groups of respondents. The biggest differences are in the approach to these facts: Q2 - "Do you need to monitor the development and supply of ICT tools for your teaching?"; Q4 - "How often do you attend courses / tutorials / workshops which focus on innovation in ICT field for your teaching?"; Q7 - "What do you consider the

biggest obstacle to the wider use of ICT tools in your teaching"? On the basis of the aforementioned facts, it is possible to specify the determined research assumption and to state that according to the rating of the questionnaire items, it is possible to classify the teachers into five relatively separate groups, where there is no such group which would uncritically accept (adore) ICT tools or, on the other hand, a group which would totally reject (resist) such use.

To ultimately confirm the research assumption, the method of factor analysis (Blahuš, 1985, p. 172) was applied, with the following parameters: main components, rotation - Varimax normalized, high load factor > 0.7. The method was used to validate or refute the research assumption that it is possible, according to the rating of the questionnaire items, to classify the teachers into five relatively separate groups. Table 2 shows the percentage of variance explained by each extraction factor.

Table 2 Factor analysis of individual questionnaire items rating; Eigenvalues and variance percentage explained by factors

Factor	Eigenvalues: Number of variables – 260 Extraction: Main components; Rotation: Varimax normal			
	Eigenvalue	Total percentage variance	Cumulative eigenvalue	Cumulative variance percentage
1	1.837290	22.96613	1.837290	22.96613
2	1.205841	15.07301	3.043131	38.03914
3	1.098699	13.73374	4.141831	51.77288
4	1.062508	12.04385	5.204339	63.81673
5	1.001260	11.45325	6.205599	75.26999

In total, 5 factors (factors representing 5 identified groups of teachers) explained 75.27% of the variance. By number of eigenvalues greater than 1, it was possible to extract 5 factors again and calculate the factor charge values of the individual criteria, as shown in Table 3.

Table 3 Factor analysis of individual questionnaire items rating

Area	Factor charges Rotation: Varimax Standardized; Extraction: Main Components, (Labeled loads are > 0.700000)				
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
	O1	-0.02364	0.33895	-0.42576	0.55138
O2	0.03619	0.04291	0.01679	0.01996	0.99617
O3	0.75984	0.21091	-0.02492	0.16806	-0.03088
O4	0.28057	-0.19671	-0.01446	0.76436	0.00696
O5	-0.60603	0.10984	0.31247	0.46668	0.01494
O6	0.81940	0.02648	0.14447	0.15152	0.08857
O7	0.14184	0.90948	0.05295	-0.05584	0.04210
O8	-0.02006	-0.06644	-0.88797	0.04444	-0.02351

It can be seen from Table 3 that the extracted factors follow from the responses to the questionnaire items for every particular group of teachers. Based on this finding, we can say that the variance of the questionnaire scores can be explained by 5 factors which represent the 5 groups of teachers having been set by us. As this classification corresponds to the established research assumption, the latter can thus be accepted. It turned out that more than 20 years old taxonomy of E. Rogers, which operated with five categories, differentiated by the level of interest and level of use of ICT tools by teachers in teaching, can still be considered valid even today.

7 Summary and discussion of the results

However, in connection with the presented results, one interesting fact has to be pointed out concerning a group of pedagogical staff with practical experience of up to 10 years. This group has surprisingly lower usage rates for some analyzes than the group comprising pedagogical staff with more than 10 years of experience. Although these results were not statistically significant, it is necessary to reflect on this fact. One explanation could lie in the assumption that this group of workers perceives the use of ICT tools as self-evident and natural in their teaching and therefore ICT tools use is not regarded as something "new". This conclusion is supported by the fact that these members of pedagogical staff underwent their undergraduate training at a time when ICT tools and their use in the educational process had already become and were an integral part of their education. That

is why the use of such tools is natural to them. However, the whole issue can be seen from a different point of view related to the length of teaching experience. From this perspective, it can be stated that pedagogues with shorter work experience will spend more time and energy on dealing with discipline and organization matters. Consequently, they will not have left enough time and/or energy to incorporate ICT tools to a larger extent. Of course, this is just an assumption which would have to be supported by relevant statistical analysis.

This problem relates to the "new" role of the teacher in the educational process, based on the consistent use of modern ICT tools in the educational process. The aforementioned results clearly point to the fact that teachers regard teaching supported by modern ICT tools as necessary, beneficial, effective, more motivating, developing more components of the pupil's personality, all in a more attractive form. The question is whether this applies to all schools where these tools are used. It is impossible to take a clear, unequivocal stance toward this issue, as a significant group of schools, the teachers of which had undergone extensive training and many workshops focused not only on the operation of ICT tools, but also on the creation of suitable didactic materials in the form of electronic teaching materials (see the project Modern Teacher, www.moderni-ucitel.upol.cz), was involved. Our effort was to develop the so-called "digital wisdom" in the context of the above-mentioned facts for a group of teachers, who could then better understand the thinking of pupils - "digital natives" (Prensky, 2009). Such massive and targeted teacher training is not common at schools. That is why there might exist schools where ICT tools serve "only" for a static projection of non-didactic content. Teachers who implement such teaching do not have the necessary competencies to prepare and implement the lessons, where modern ICT would represent an integral part of interaction between teacher, subject matter, and student.

8 Conclusion

The research carried out in the form of quantitative research methods *did not prove the existence of a clearly identifiable group of pedagogical staff who would uncritically accept and use modern ICT tools in teaching. At the same time, the existence of a group which would clearly reject ICT tools was not proved either.* Based on the results, it is possible to distinguish relatively separate groups of members of pedagogical staff according to the degree of their evaluation and usability of ICT tools in teaching. However, this distinction or classification is not supported by the overall approach to these tools, but only by some aspects of it. The identification of these aspects shall be the subject of further research realized by us.

Last but not least, the above-described research pointed to additional interesting facts. First of all, we can say that over 50% of the teaching staff monitor the current supply and development of ICT tools for their teaching and only 7.7% of them do not feel the need. Furthermore, it emerged that the most frequently used source of information necessary for monitoring the development and the offer of new ICT tools is the Internet (48.8% of respondents) followed by educational events (25.9% of respondents). The vast majority of teaching staff - 76.1% in total, perceive the current offer of ICT tools as sufficient whereas only 4.6% of pedagogical staff perceive this offer as being totally inadequate, and 19.2% as rather inadequate. It can also be noted that 0.9% of pedagogues claimed that they totally reject the use of ICT tools in teaching, while a much larger proportion of teaching staff, a total of 56.8%, hold the opposite view and welcome the use of ICT tools in their teaching.

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Primary Paper Section: A

Secondary Paper Section: AM, IN

VERIFYING THE DEVELOPMENT OF THE ARGUMENTATION ABILITIES OF TEACHING STUDENTS

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Abstract: Part of the basic skill-set for graduates of teaching programmes should be the ability to think critically. One of its main components is the ability to argue. The subject of interest in developing this ability is for future teachers to achieve transferable ability applicable in practice. The partial objective of the large-scale experiment was to verify the development of argumentative skills through targeted training. The intervention was carried out in the summer academic semester 2015/2016, for 13 weeks on three selected subjects of study. The selection group consisted of three equal groups of students in pre-university preparation for the teaching profession at Prešov University in Prešov (control group – n = 21, experimental group 1 – n = 21, experimental group 2 – n = 20). The core measure was the Logical Thinking and Argumentation Test and the Quality Score Indicator of the ability to argue. The focused development of the selected component brought positive findings and practical recommendations.

Keywords: Ability to argue, level of logical thinking and argumentational thinking and argumentational abilities, ante and post measurement of ability to argue.

1 Introduction

We encounter the issue of arguments and argumentation every day. Few people know that argumentation is subject to strict rules of formal and informal logic, i.e. a good argument has a certain structure, that it is necessary to know the deductive and inductive reasoning based on which we can construct relevant arguments, and so on. Very little attention is paid to the development of quality argumentation in educational practice in Slovak schools. There are several reasons, but one of the most serious is that in undergraduate preparation for the teaching profession there are no modules to give a socio-scientific basis focusing on a thorough knowledge of philosophical, pedagogical thinking and the foundations of modern logic are lacking. Students in the undergraduate training for the teaching profession should have the skills to know how to think well and should be able to teach this skill to their pupils for reasons such as eliminating manipulation, defending one's own project with relevant arguments, and so on. Unfortunately, the teaching system as well as the analysis of the information sheets of modules of study of selected Slovak teacher training programs do not suggest that such a kind of discourse is part of the results of the education of the graduates of the given grades of Slovak universities (except for rare cases). The ability to argue is necessary for the needs of personal and social life. Effective argumentation is essential when planning and designing activities, advocating proposals, complex problem solving, and so on.

A partial aim of the research was to determine the level of the abilities of teaching students to argue and to determine if there is a statistically significant difference in the ability to argue before and after the targeted intervention. The inspirational source of preparation, planning and creation of activities related to the development of argumentation skills in the education of teaching students has been primarily foreign resources (e.g. Cottrell, 2005, 2011; Walton, 1998, 2013 and others).

2 Starting point in formulating the problem

The problem of argumentation was encountered even in ancient times through the beginnings of communication theories and classical rhetoric associated with the Sophists, the dialogic method of Socrates, the work of Quintilian, and so on. (Kudláčová, 2009; Kominarec and Kominarec, 2015). According to the authors, the argument (currently considered one of the most important components of critical thinking) is the basis of communication in classical rhetoric. This method of

argumentation from the period of Ancient times is, to a certain extent, accepted up to the present time, particularly in the sense of justifying facts, confirming the truth of the communicator's expression, Paul, Elder and Bartell (2003) consider the argument to be one of the key components of creating a critical judgement based on norms derived from the roots of ancient Greece. Lai (2011) found that a number of leading experts (Ennis, 1985; Facione, 1990; Paul, 1992; Halpern, 1998; Watson and Glaser, 1990 and others.) consider analysis of arguments as one of the pillars of the critical thinking process. West, Toplak and Sanovich (2008) also emphasize the ability to evaluate evidence and arguments to be an essential element of critical thinking. Schmoker and Graff (2011), Ferencová (2017) consider argumentation to be the basic skill necessary for our success as citizens, students and workers.

Foreign literature presents a large amount of knowledge on the issue of argumentation (e.g. Eemeren, Grootendorst and Henkemans, 1996; Mason, 1998, 2001; Yeh, 2002; Kuhn and Udell, 2003; Davies, 2008; Cottrell, 2011 and others). Walton (1998) in his dialogue theory has suggested seven different types of dialogues about arguments that depend on whether the aim is convincing, negotiating, gleaning information, sharing, asking, expressing emotions, or a combination thereof. The author notes that it is most important for students to be aware of strategies and goals why the given approach was chosen. This reflective activity is highlighted by several scientists (Brown, 1997; Yanklowitz, 2013 and others).

In Slovakia, the issue of argumentation is the focus of the Slovak Debate Association (SDA), which since 1999 has been devoted to the systematic development of debates (SDA, 1999). Its main goal is to teach young people to think critically – to distinguish quality arguments from inferior ones, facts from opinions, and so on; and other skills - teamwork, learning, finding solutions, research skills, and so on.

As indicated above, the ability to argue is an essential element of critical thinking and should be developed in a future teacher. As a result, the question arises as to whether the students in the teaching process can argue and whether this ability can be developed by targeted training. In designing a development program for the selected component, we were inspired by Cottrell's (2011) recommendations that offer critical thinking skills structured to help students build this ability from basic understanding to applying techniques and strategies and other works mentioned above.

3 Measuring the experiment

The development of students' argumentation abilities was part of an extensive intervention program for the development of critical thinking in teachers. The partial objective of the experiment was to verify whether targeted training would increase the indicator of ability to argue. A proper experiment – single-factor parallel groups – was used to verify the aim.

The operational definition of the variable *ability to argue* (a defined variable in the position of the dependent variable): systematically, intentionally (13 weeks), within the three selected subjects (3 hours a week), the development of the selected skill specially trained for this purpose by a trained teacher.

Two means were used to measure the starting and final values of this variable:

- The Logical Thinking and Argumentation Test (TLMAS), the tasks of which were created by the SCIO company (2015, a society focussed on the development of critical thinking in the Czech Republic). The tasks in the logical and argumentation part tested the basic skills and abilities that a

student needs for successful college studies. The sub-tests in the logical and argumentation sections included 18 tasks (each subtest had 9 tasks). The role of the respondent was to use the rules of formal and informal logic. The time limit was set to approximately 30 minutes. In testing the students, all the author's recommendations were followed.

- *Indicator of quality of ability to argue* was used for three starting and final tests in all groups included in the experiment. This ability was evaluated in every subject using worksheets with study text and a statement where the task of the subject was to analyse the statement and determine: 1) the first specific detail and two relevant comments to go with it; 2) the second specific detail and to relevant comments to go with it; 3) the conclusion of the argument (on the basis of proofs of whether the argument is true or not) – 7 points total for the worksheet.

In characterising the individual groups of subjects included in the experiment, the basic statistical characteristics were used (Kerlinger, 1972): number (*N*), relative number (%), mean (*M*), standard deviation (*SD*), minimum and maximum value. The differences between groups in terms of the ante measurements were performed using one-way ANOVA. The differences between the ante and post measurements were found using the t-test of comparing means.

The basic group consisted of students of teaching at the Faculty of Human and Natural Sciences, the Philosophical Faculty and the Faculty of Sport at Prešov University in Prešov. We initially selected (Švec, 1998) 17 groups of students (*N* = 365) and tested the subject's initial levels of argumentation at the beginning of the winter semester of the academic year 2015/2016. For the needs of the experiment, we selected three (in terms of ante measurement) balanced classes of students. We randomly assigned experimental conditions to the selected groups (experimental group 1 / EG1 / - *n* = 21 students; experimental group 2 / next EG2 / - *n* = 20 students; control group / next CG / - *n* = 21 students).

4 Results of the experiment and discussion

In this part we present selected components related to the experimental verification of development of the ability to argue in selected groups of the teacher training programme at Prešov University in Prešov.

4.1 Equivalence of the experimental groups in the ante measurement

One of the conditions for implementing the right experiment is the matter of choosing equivalent groups (Kerlinger, 1972). Experimental groups took the TLMAS test, which is a commonly used tool for finding the general requirements needed for university study. It contained two subtests - Logical Thinking (9 Tasks) and Argumentation Skills (9 Tasks). The subject's job was to investigate the statement and assess the adequacy or validity of its assertions. For each correctly performed task, the student was awarded 1 point. Table 1 shows the descriptive statistics for TLMAS test scores achieved in individual groups.

Table 1 *Descriptive statistics of ante measurement of groups using the TLMAS test*

Groups	Gross score				
	Number (n)	Average (M)	SD	min	max
Cotnrol group	21	7,76	2,89	4,00	14,00
Experimental group 1	21	7,71	2,88	2,00	13,00
Experimental group 2	20	7,40	3,33	3,00	14,00
Total	62	7,62	2,99	2,00	14,00

Legend: *SD* – standard deviation; *min* – minimum value; *max* – maximum value

One-way ANOVA found that there are statistically significant differences between the individual groups (KS, ES1, ES2) in the average gross TLMAS score before application of the intervention programme. Table 2 shows the results of the one-way ANOVA.

Table 2 *Equivalence of groups on the basis of the results achieved in the TLMAS test*

Sum of Squares	d.f.	Mean Square	F	<i>p</i> – value
1,573	2	0,786	0,085	0,919

Legend: *df* – degree of freedom (*d.f.*); *F* = statistical criterion; *Sig* = *p* – probability of mistaken rejection of the null hypothesis

On the basis of results of one-way ANOVA we can state that between the individual groups there was no statistically significant difference in average gross score achieved in the TLMAS test in the ante situation (*p* > 0.05). This confirms the equivalence of the groups.

4.2 Results in the ante and post measurements

The aim of the experiment was to find if the intervention with the teaching students increased their ability to argue. The following tables present the results of the t-test comparing means in the ante and post measurements.

Table 3 presents ante and post measurements of the ability of students to argue achieved in the TLMAS test.

Table 3 *T-test comparing means achieved in TLMAS in ante and post measurements*

Gross Score TLMAS	<i>N</i>	<i>M</i>	<i>SD</i>	Difference <i>M</i>	Difference <i>SD</i>	<i>t</i>	<i>p</i>
ante control group	21	7,76	2,89				
post control group	21	7,33	3,08	0,42	2,71	0,72	0,477
ante experimental group 1	21	7,71	2,88				
post experimental group 1	21	9,66	3,32	-1,95	1,82	-4,89	0,000
ante experimental group 2	20	7,40	3,33				
post experimental group 2	20	10,10	3,41	-2,70	3,09	-3,89	0,001

Key: *N* – number; *M* – average; *SD* – standard deviation; *t* – result of t-test; *p* – value

In the t-test used (table 3) it was shown that the targeted training in ES 1 (*p* = 0.000) and ES 2 (*p* = 0.001) increased the logical and argumentation ability with a level of significance *p* < 0.001 compared to the control group (*p* = 0.477), where the traditional form of education took place i.e. without specific training in argumentation ability.

The ability of the subject to argue was monitored in three ante and three post measurements using the quality indicator of the argument evaluated according to predetermined criteria. Specific findings are presented in Table 4.

Table 4 *T-test comparing achieved means of ability to argue*

Measure ment	<i>N</i>	<i>M</i>	<i>SD</i>	Difference <i>M</i>	Difference <i>SD</i>	<i>t</i>	<i>p</i>
CG ante 1	21	2,33	1,31				
CG post 1	21	2,47	1,32	-0,14	0,72	-0,900	0,379
CG ante 2	21	2,38	1,28				
CG post 2	21	2,52	1,24	-0,14	0,79	-0,826	0,419
CG ante 3	21	2,14	1,01				
CG post 3	21	2,42	1,24	-0,28	0,95	-1,369	0,186

EG1 ante 1	21	2,66	1,79				
EG1 post 1	21	4,33	1,35	-1,66	1,15	-6,614	0,000
EG1 ante 2	21	2,42	1,53				
EG1 post 2	21	4,61	1,39	-2,19	1,07	-9,312	0,000
EG1 ante 3	21	2,19	1,28				
EG1 post 3	21	4,85	1,35	-2,66	1,06	-11,47	0,000
EG2 ante 1	20	2,55	1,73				
EG2 post 1	20	4,50	1,70	-1,95	1,19	-7,322	0,000
EG2 ante 2	20	2,20	1,28				
EG2 post 2	20	4,65	1,49	-2,45	1,27	-8,585	0,000
EG2 ante 3	20	2,40	1,50				
EG2 post 3	20	4,55	1,63	-2,15	1,18	-8,134	0,000

Key: CG – control group; EG – experimental group; N – number; M – average; SD – standard deviation; t – result of t-test; p-value

The same statistical test, showed that intervention increased the ability to argue (Table 4) in both experimental groups ($p < 0.001$) in contrast to the control group, where the teaching was traditionally conducted. In that group there were no significant differences between ante and post-measurements ($p = 0.164$).

It must be noted that although we have achieved positive results in the monitored component, the whole process of preparation for the given type of teaching was very challenging and the beginnings were very difficult. The biggest barrier is that the students were mostly not used to working in depth (except for some individuals), as evidenced by the level of analytical thinking of several groups of university students (Kosturková, 2016). Other barriers may also be those identified by Cottrell (2011): school culture, lack of desire of the educator to work in depth, limited feedback or lack of feedback, time limitation, limited availability of resources, and so on. From this it is possible to infer that there are two basic types of obstacles to the development of the ability to argue: internal and external

Students in the experimental groups have gone through a variety of argumentation techniques throughout the duration of the experiment. In the beginning, easier methods were used such as, for example, T-schemes, Venn diagrams, constructive disagreements, but also harder ones, such as creating an argumentation line, identifying and analysing logical errors in political debate, preparing and implementing a Karl Popper style debate. A source of inspiration can also be various argumentation tasks created using the SCIO (2015) tests, the argument assessment task based on the Critical Thinking Criteria (Watson and Glaser, 1990). We consider an interesting method to be essay writing following the Schaffer model (1995). Its simplified argumentation scheme has an exact order: the statement, specific details, supporting evidence, comments and commentary, more comments followed by commentary. If the educators can handle the basic paragraph (e.g. 4 sentences), they should add additional specific details and always use the ratio of two comments per detail. Later students add a final judgment. Nemčok et al. (2014) point out that each argument must have a statement, analysis (explanation) of the argument, proof and summary of the argument. One of the students' outputs was the preparation and implementation of a debate on a chosen topic. Recommended literature in the preparation was mainly information from foreign experts (e.g. Warburton, 1996; Cottrell, 2005; Cottrell, 2011; Walton 1998 and 2013). Part of the seminars of selected study subjects included examples and recommendations on how to construct arguments (for example, according to experts from the University of Plymouth, 2009, etc.).

5 Conclusion

In the environment of Slovak universities and colleges preparing future teachers, we record a significant deficit of empirical studies focusing on the issue of argumentation as an important component of critical thinking. Particularly in teacher study programs, we consider it important to develop this competence in order for future teachers to acquire this transferable skill, which they will also be able to apply in school education. This ability can help the individual evaluate products, services, and resist media manipulation. Several pieces of foreign research and the results of our experiment have shown that through targeted training it is possible to acquire a number of argumentation techniques and strategies to develop the ability to argue relevantly. In general, graduates of a given level of education are expected to have developed critical thinking – the argumentation, analytical skills required at national and international level as the competencies of the future as defined, for example, by World Economic Forum (2018).

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Primary Paper Section: A

Secondary Paper Section: AM

SIGNIFICANCE OF INNOVATION IN SLOVAK REGIONS – ISSUES AND CHALLENGES

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This paper was supported by the Slovak Ministry of Education's Scientific grant agency VEGA: "The impact rate assessment of clusters on the development of regions in Slovak Republic". Project registration number: [Reg. No.: 1/0953/16]

Abstract: Innovation is an important improvement and development element in all areas of economic and social life, business environment as well as regional processes. By means of analysis, comparative analysis methods followed by logical deduction the main goal of this paper is to determine the priorities of Slovak Republic's innovation strategy and policy based on analysis of the status of Slovakia and its regions in the area of innovation within the European Union context. Slovak regional and innovation policies are acting as a main synergic issue coming out of EU innovation and regional policies interaction. Their parallel collaboration and positive effects have significant fallouts on regional development and limiting the regional discrepancies in Slovak regions.

Keywords: regional competitiveness enhancement, regional innovation strategy, technology and innovation, regional discrepancies.

1 Introduction and Theoretical Background

The role of innovation is to turn research results into new and better services and products in order to remain competitive on global market and improve the quality of life of Europe's citizens. Innovation is made possible by research and education. The EU would require at least one million more researchers in the next decade to reach the target of investing 3% of its GDP in R&D by 2020 (Okřelická et al, 2015). The Innovation Union has proposed measures to complete the European Research Area. This means more coherence between European and national research policies, and removing obstacles to researchers' mobility. In education, the Commission supports projects to develop new curricula addressing innovation skills gaps. Cohesion policy also focuses on research and innovation. In more developed regions, at least 80% of the European Regional Development Fund (ERDF) resources are allocated to innovation, with the priorities being a low-carbon economy and competitive SMEs (Dubravská et al, 2015). EU regional policy aims at reducing disparities among levels of regional development and mitigating the slowing of less developed regions under Articles 158 and 160 of the Treaty on European Communities. One of the basic principles of the EU's functioning is the principle of solidarity, in terms of which economically stronger countries contributes to the weaker ones. A similar situation should be transferred from the European level to the national (Fojtíková, 2016; Ivanova, Masarova, 2018; Čihelková, Hnát, 2008).

In 2011, the EU 2020 Territorial Agenda (Towards an Inclusive, Smart and Sustainable Europe of Diverse Regions) was adopted, building on the objectives of Europe 2020 Strategy and as a key development factor the territorial perspectives are to be implemented. In addition to identifying the most important territorial challenges for Europe, it also sets territorial development priorities, measures for their implementation (Varadzin, 2016; Malec, Abraham, 2016). The strategy serves as a guideline for regional development, supports the integration of territorial approach into different sectoral policies at different levels of government, and links the principles of territorial cohesion with the Europe 2020 objectives (Zadrázilová, 2016; Machková, Sato, 2017). Priorities include support for polycentric and balanced territorial development; promoting integrated development in cities, rural and specific regions; promoting integrated development in cities, rural and specific regions; ensuring the global competitiveness of regions, based on a strong local economy; improving the territorial connectivity for individuals, communities and businesses; and finally managing and interlinking the environmental, landscape and cultural values of regions (Havierníková 2016; Vojtovič et al, 2016).

When understanding the relationship of innovation, space and agglomeration effects, there is a clear significance of knowledge-based entities concentration as the innovation carriers for the development of regions and formation of a competitive environment. In this context, we consider it necessary to explain the term of an innovative milieu (environment) that represents an incubator for innovation, while the innovation factor is not considered to be the enterprise by itself but an innovative environment resulting from interaction among businesses, institutions and labor. Its functional framework consists of various stakeholders (firms, research institutes, educational institutions, local or regional institutions being independent from decision-making processes), physical (endogenously available resources and infrastructure), non-material (know-how) and institutional (organizational management, institutions with decision making competencies) elements. An important starting point for mutual co-operation is the interaction form and learning culture, which is shaped in time and, depending on the changing behavior of actors it generates new solutions (Hamilton, Wepster, 2009; Drulák, Druláková, 2014). The actors through information exchange and the "learning" process reduce the uncertainties that arise from the permanent transformation of technological paradigms (Prno, 2008). Another understanding is provided by Buček (2006), who emphasizes the meaning of so-called external specific image, i.e., thick network of (informal) social relations within a territorial unit that stimulates innovation capabilities through synergic and collective learning processes. The formation of an innovative environment depends mainly on the socio-economic characteristics of regions (internal environment that determines the character and strategic behavior of entities) and external conditions (created by government through innovation and regional policy) (Mura, Orlikova, 2016; Rumpel et al, 2008).

Innovative systems are a reflection of innovative environment. The highlight on spatial dimension is contained in the definition. The innovative systems are generally composed of a geographically defined, administratively supported arrangement of innovative networks (companies) and institutions that respond regularly and strongly to each other to increase the innovative outcomes efficiency of individual companies in the region (Rehák, 2006). The part of innovative systems can be elements (institutions, participants) and relations that interact with each other in the process of production and diffusion as well as by using the new, economically beneficial knowledge. According to other authors (Ručinská, 2008; Taušer et al, 2015; Taušer, Čajka, 2014; Lipkova, Braga, 2016), as innovative systems elements are considered to be the entities of manufacturing (knowledge-based companies, industry clusters, etc.) and scientific (educational and research institutions working with the business environment in order to transfer new knowledge and technologies to business environment) sectors as well as the network of supporting institutions (governmental, counseling and innovation centers, chambers of commerce, financial bodies, industrial parks, agencies that help transfer the knowledge of science and research into practice, etc.).

Individual actors influence the innovative processes and collaboration being necessary for creation and operation of an innovative environment. Collaboration takes place in a number of ways. It is a support for innovative networks and cooperation, provision of knowledge and information for businesses to reduce uncertainty in their economic activities, a support for incentives structure that will ensure the profitability of innovation in long run and so on (Skokan 2004; Brakman, 2006). Innovative systems can be at three hierarchical levels. Firstly, it is a national level formed by a network of public and private sector institutions in the field of research, education, industry and others, whose activities and interactions initiate, support, modify and disseminate new technologies, and their activity determines the innovative performance of national companies (Balaz, 2010). Secondly, it is a regional level where the actors are influencing innovation behavior and an innovation environment at regional

and local level, taking into account regional specificities, links and interrelationships (Vojtovic, 2016). And finally, it's a sectoral level.

Regional systems have an important role in regional development, whereby a strong system is considered as the one having the interconnection linkage between knowledge production sources (universities, research institutions), intermediaries (public and private innovation services) and firms (Bucek, 2006).

2 Problem Formulation and Research Methodology

This paper will discuss how issues such as aggregate innovation index, the innovation strategy and the innovation policy of Slovak Republic; missing valid model for explaining innovative processes in Slovak regions; regional discrepancies; and finally the importance of innovation and its support in region are affecting the process where innovation is supposed to be the pillar of regional development in Slovakia.

By means of analysis, comparative analysis methods followed by logical deduction the main goal of this paper is to determine the priorities of Slovak Republic's innovation strategy and policy based on analysis of the status of Slovakia and its regions in the area of innovation within the European Union context. The purpose is to figure out the scenario how innovation as a crucial pillar of regional development in Slovakia is affecting the execution of Slovak regional and innovation practices implementation processes in order to enhance and reinforce the sustainable economic growth and to reduce the fallouts of deepening the regional discrepancies process in Slovak Republic.

3 Findings and Discussion

To deal with the issue of significance of innovation in Slovak regions aspects such as the aggregate innovation index, the innovation strategy and the innovation policy of Slovak Republic must be discussed. The current situation in Slovakia points out to the insufficient regional innovation structure and the prevailing weak pro-innovative culture. Scientific research capacities are concentrated mainly in the western part of Slovakia, where they form spatial groupings along the axis of Bratislava-Trnava-Piestany and Trenčín-Ilava-Žilina, then in Banská Bystrica, Zvolen, Prievidza, Nitra, Košice and Poprad. In the regions of southern and eastern Slovakia there is an absence of scientific research entities and centers. In all regions there is a persisting problem of poor science-research infrastructure with low linkage on education system and practice. Support centers are represented by a network of business innovation centers focusing on technology transfer, support for the development of innovative companies, building an innovative database on science, research and practice links, building contacts with scientific research institutions and relevant government and public authorities. Furthermore, there are Regional advisory and information centers whose role is to improve the conditions for the development of small and medium-sized enterprises, to promote socio-economic development and integration into European economic structures. The system is complemented by business incubators, first contact centers and a network of regional development agencies (Ministry of Economy SR, 2018 modified). An important role is played by SARIO - Slovak Agency for Investment and Trade Development in Bratislava within its regional offices.

According to the aggregate innovation index, Slovak regions can be classified into three categories (Buček, 2006). The first category consists of regions with companies with a high share of funding being invested in research and innovation activities and regions having a significant position within the country. In recent years, the region of Bratislava has been approaching this category, with the background of scientific and research institutions and the concentration of population with university education and the above average socio-economic status. The persistent problem is the insufficient intensity of cooperation

among the scientific and research and business environment. The Bratislava region is generally considered to be highly attractive in terms of foreign investments location and conditions for the emergence and diffusion of innovation. The second category includes the districts of Trnava, Nitra, Trenčín, Žilina, Banská Bystrica, Zvolen, Košice, Prešov and Humenné. Regional city district locations have a more favorable innovative environment for the development of a knowledge-based economy. The third group is represented by the rural regions of southern and eastern Slovakia with the absence of capacities and infrastructure for innovation development and innovative environment building. Innovation strategy and innovation policy of Slovak Republic create the conditions for establishment, functioning and development of innovative structures, innovative enterprises, cooperation and partnership of science and research institutions, educational institutions, enterprises and acquiring new markets in a sustainable environment, in order to secure effective contribution to society (Ministry of Economy SR, 2018). An innovation policy requires a differentiated approach that takes into account the regional needs and regional specificities.

The Innovation strategy of the SR for 2014-2020 (Ministry of Economy SR, 2018), based on the EU Innovation Strategy, is focused on priorities such as high-quality infrastructure and efficient system for innovation development (infrastructure is a necessary condition for stimulating and expanding of the third-generation innovation); high-quality human resources (highly educated and professional human resources are a prerequisite for innovative private sector activities, particularly in the area of SMEs); efficient tools for innovation (innovation should be an integral part of as many business activities as possible). We argue it is necessary to stimulate the emergence of non-financial instruments and interconnected programs at national and regional level.

The objectives of Innovation Policy of SR for 2014-2020 are aspects as follows: it is necessary to increase the competitiveness of entrepreneurial entities in compliance with the principles of sustainable development; development of employment - to increase the professional level and labor force flexibility; and at last it is the issue of regional development. In the future, innovation can be considered as one of the main tools for knowledge economy development, ensuring the high economic growth of SR in order to reach the level of the most advanced EU economies. Meeting the goals and priorities of Slovak Republic's Innovation Strategy by 2020 it will create the conditions for the positive development of innovation processes with economic and social projections, increasing the share of innovation in GDP formation from the current 8% to 25%, increasing the share of innovative enterprises from 13% to 50%, increasing the share of university and academic research on the so called business innovation from 1% to 5% and increasing competitiveness of SR in global economy environment (Ministry of Economy SR, 2018).

To meet these priorities can be achieved by stimulating in the field of science and research so that universities, Slovak Academy of Science and other development capacities, including SMEs, can actively be engaged in global R&D and participate in global innovative environment development in Slovak Republic. Innovation support for 2014-2020 is part of the Cohesion Policy programming documents on national level - Research and development and Competitiveness and economic growth. This direction in the field of innovation development will lead to the development of a knowledge-based economy, the growth of competitiveness and the improvement of current 47th ranking position of Slovak Republic within the World Economic Forum in 2016. The main strategic role how to maintain the competitiveness of Slovak Republic is the support and development of innovation and infrastructure.

Another major problem in terms of the significance of innovation in Slovak regions is that there is no universally valid model for explaining innovative processes in Slovak regions. Typology of regions in terms of innovation potential / assumptions based on socio-economic, geographic and

institutional criteria is needed to define certain problems in innovative processes for each type. Firstly, it is necessary to identify types of problematic regions and tools to support innovation. Based on the typology of regions and their innovation specificities, needs and options, it is then appropriate to choose a way to explore regional innovation, appropriate ways and indicators how to measure innovation (inputs, outputs, efficiency, potential).

The next step is the particular measurement of regional innovation. Regarding the fourth generation of indicators it is the most comprehensive, system-based approach to innovation. They measure not only the current state but also the process, development and, dynamics. Indicators of the fourth generation are to be understood as follows. The first element is knowledge – it is not about individual but composite indicators that denote investment being put in this area on one hand and performance on the other hand. Next, there are networks – they are composite indicators of formal networking based on contracts, agreements, strategic partnerships, intellectual property, licenses, as well as informal cooperation and knowledge exchange such as working relations among individuals within clusters. Finally, there are the conditions for innovation – economic demand, public policy environment, infrastructure conditions, social attitudes, cultural factors. System dynamics indicators describe the characteristics of innovation system and its dynamics, even with a view to forecasting wider economic developments (balanced scorecards, mapping of technological development, monitoring of demand changes, monitoring of global innovation frameworks, technological options, etc.) (Rehák, 2006; Ručinská, 2008; Ministry of Economy SR, 2018).

Measuring and evaluating the regional innovation potential, with innovative potential we understand the ability not only to create but also to use innovation (not only scientifically, but also broad social, not only in corporate environment but also institutional, organizational innovation, social innovation) in local conditions using local potential, requires a very complex and systemic approach. It is a dynamic process, not a static variable. Particularly challenging is the understanding and exploration / quantification / analysis of the process – the nature and depth – of relations among regional actors in the area of origin, dissemination and application of innovation. Research requires a quantitative and qualitative approach and information from a wide range of subjects. From the point of view of the areas of scientific research, we propose a multidimensional approach – to study not only the economic but also the geographical, demographic and social dimension of the origin, spread and application of innovation in regions.

One of the most serious significances of innovation in Slovak regions is to deal with the issue of regional discrepancies. The regional policy of Slovak Republic deals with large regional differences and prepares strategies, tools and programs for their mitigation. Slovakia is characterized by enormous regional disparities – the differences between regions. Large regional differentiation is given geographically, historically, culturally, economically, by ethnic, religious, ancient cultural and administrative centers. It is affected by external cultural influences, deliberate state interferences in regions (especially before 1989), and urbanization and industrialization level. Large differences are also in the geography of population, for example, north and east of Slovakia is typical for high population dynamics and on the contrary the south and southwest are territories with the opposite trend. Large differences are also in the educational level, in economic performance and also in social sphere. To remove and eliminate those discrepancies the European Cohesion Policy Instruments (Structural Funds) and the European Fund for Rural Development are currently being used in particular. Other tools are government grants and support to foreign and domestic investors for new investment within production, especially in regions with high unemployment rate.

The latest statistical data confirm that in Slovakia there is still the continuing phenomenon of rich, respectively, richer West and poor East. Within the western Slovakia, the "golden"

triangle Bratislava – Nitra – Trnava is also often mentioned. This corresponds to the current pan-European development concept called "Red Octopus". The settlement structure of Slovakia is characterized by a high degree of fragmentation (more than 2900), of which small (up to 1000 inhabitants) make up 67% and live in there 16% of population. Altogether 44% of population lives in rural settlements. On the other hand there are settlement centers that play the role of growth poles. These are bigger and bigger towns (over 50,000 inhabitants), where almost 25% of Slovaks live (Ministry of Economy SR, 2018). These centers support linkages among regions and ensure the transfer of growth effects between them. The Slovak advantage is a favorable position for inclusion in natural cross-border agglomerations. In the southwest of SR, it is the area of Vienna – Bratislava – Győr, in the north it is Silesia – Ostrava – Zilina – Martin, in the east – Košice – Prešov, with the connection to the west part of Ukraine and northeast of Hungary.

Within the Slovak Republic, the West-East and North-South gradient of development is manifested. This gradient of socio-economic development has a strong economic core, which is made up of the Bratislava region and its neighboring regions. Economic prosperity and directional investments are increasingly exacerbating the differences between this area and the economic performance of eastern and southern Slovakia. Growing disparities were most pronounced in the number of 9 profit-oriented organizations per 1000 inhabitants, labor productivity in industry and construction and GDP per capita. The development of these economic indicators has also been reflected in socio-economic sphere through relatively large disparities in unemployment rate and the number of completed apartments per 1000 inhabitants. The only economic indicator for balancing regional disparities is the number of traders per 1000 inhabitants (Eurostat Press Office, 2018).

To overcome the innovative regional disparities, it will be necessary to create a national innovation system with regional innovation structures (incubators, innovation centers, counseling centers and other elements) to bring innovation activities and support activities as close as possible to entrepreneurs and SMEs in particular. The innovation potential, the innovation climate and the activity of individual regions of SR with the exception of Bratislava city and Bratislava region are below average and substandard.

Problem areas that require a priority solution are of the following nature. These are issues like the low innovation climate in Slovak economy; the continuing resilience of existing structures and funding for science, research and innovation; insufficient attention paid to scientific and innovative education at all levels, both in the public and private sectors; insufficient intensity of international cooperation and low involvement of Slovak subjects and experts in shaping the European Research Area; insufficient presentation of significant international institutions of science, research and innovation in SR (European Commission, 2017; Ministry of Economy SR, 2018). Issues such as insufficiently developed infrastructure for science, research and innovation and the implementation of support programs at regional level are also addressed; the absence of a management system and coordination at regional level; low share of innovative enterprises in the total number of existing or emerging business entities.

If we assess the competitiveness of individual regions of Slovak Republic in terms of conditions for the development of science, research and innovation, then the regions can be divided into several basic groups, emphasizing that there is concentration of science and research and innovation within the centers of innovation, especially in regional district cities. These innovation centers should play an important role in the future in networking and clustering, which functioning can greatly influence the economic and social environment of regions, their attractiveness and competitiveness. Employment, education and business environment must become the main priority areas in relation to research, development, innovation – the knowledge economy.

The last discussed area of significance of innovation in Slovak regions is to determine the importance of innovation and its support in region, where the regional innovation strategies of individual regions of SR appear here as a supporting and implementation tool. The Regional Innovation Strategy puts innovation into focus as the main development factor of region's economy. The highest added value is hidden in products that are built on the use of R&D results, high-tech, modern technologies, or practices. It does not necessarily mean product innovation, but also processes and marketing practices. Innovation is therefore an important tool for increasing the competitiveness of companies. Competitiveness enhancement with comparison to a foreign country produces increased revenue from an enterprise perspective, and it primarily contributes to improving the economic situation of enterprises and has a secondary impact on the regional economy. Most regional companies are aware of the need to innovate their products, processes, or marketing practices, but in many cases they encounter difficulties in obtaining resources, inadequate supply from research institutions, or poor skill structure of human resources in the region. These shortcomings are to be neutralized by a comprehensive regional innovation strategy to develop innovation policy principles and to create a functional regional innovation support infrastructure. It is based on the assumption that the managed development of innovation in the region must be formed from the top of the regional authority.

An example of the implementation process in Slovak Republic is the development and implementation of a regional innovation strategy in the Trenčín region. The main objective of this project is to build a comprehensive innovation capacity of the region, which will result in an increasing performance of regional economy. The project aims to create an environment that fosters regional innovation potential, cooperation among existing institutions and organizations. It creates a strategic development framework that will enable businesses to introduce further innovations and apply R&D to business environment. A regional innovation strategy work out is only the first step to start the development of Trenčín region on the basis of innovation. However, it should be emphasized that this is a very important step for the development of new development projects funded by European structural policy tools. The strategy determines the direction for the next programming period and creates the prerequisites for further progress in the region.

4 Conclusion and Further Implications

As conclusion we can say that the new approach to support innovation in Slovakia will help to ease the major challenges facing the Slovak innovation system, and at the same time, will mobilize innovation in all the relevant sectors through significantly stronger participation of all relevant partners at governmental and regional levels to support the development of Slovak regions. In this paper we have shown how innovation policies are acting as a main synergic issue coming out of EU innovation and regional policies interaction. Their parallel collaboration and positive effects have significant fallouts on regional development and limiting the regional discrepancies in Slovak regions. Finally we can summarize that innovation is a very difficult subject for public policy; it is at once a pervasive and elusive subject. It is pervasive since it entails both government and private investment; it is pervasive since it permeates all areas of public policy, from tax to labor, from telecoms to energy, from competition to industrial policy, from education to intellectual property, from immigration to health and agriculture, from supply-side to demand-side policies; and also, because it requires actions at the global, EU, national, regional and local levels.

Regarding the further vision associated with this kind of research as the follow up issues that will be necessary to be taken into consideration and be assessed are the areas such as the linkage of Innovation Union and cluster policies / clusters development in terms of technology advance and their impact on EU creative industries development; and Strategy 2020 assessment regarding its impact on EU economy competitiveness enhancement versus

the US economy in terms of the TTIP agreement (Transatlantic Trade and Investment Partnership). Regarding this context the next research will be also geared to assessing the impact of EU innovation strategy and EU Regional policy on Slovak industry policy and Slovak innovation agenda; as well as the fallout of EU Innovation policy on EU Energy policy along with implications on Slovak energy security.

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Primary Paper Section: A

Secondary Paper Section: AH, AE

REFLECTION OF THE DEGREE OF INTERNATIONALIZATION IN THE ABSORPTION CAPACITY OF THE CZECH REGIONAL BUSINESS ENVIRONMENT

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The paper was processed under the SGS grant - Internationalization of regional business environment.

Abstract: The aim of the paper is to find out how the degree of internationalization is reflected in the intensity of the foreign presence in the Czech regional business environment. The absorption capability is illustrated for six selected regions, in a series of thirteen years. The extent to which the regions can benefit from their degree of internationalization demonstrates the built-in transfer intensity indicator. Indicator values reflect how the region can benefit from productivity gains from the presence of foreign firms. The calculations performed show that all regions achieved positive average growth coefficient values, i.e. that the whole group of regions was able to absorb the technological growth opportunities brought by the analyzed foreign companies. From the trend's point of view, the Hradec Králové region is most successful in finding the potential in localization from foreign firms, and conversely, the smallest values have been identified in the Carlsbad region.

Keywords: Absorb capacity, business environment, foreign direct investment, internationalization, host region, productivity

1 Introduction

Foreign Direct Investment (FDI) creates a range of effects for the host region. However, the professional public has been, repeatedly, divided in their opinions on this type of foreign capital. There is no single view regarding FDI. One reason is that the impacts and effects of FDI are difficult to measure in the host region. Another major problem is that the impact of FDI is difficult to quantify, not only on the host economy's business environment, but it is also difficult to simultaneously evaluate whether and how much the local business environment receives and draws on the advantage of locating a strong foreign investor.

Although the Czech Republic is considered to be a successful recipient of foreign direct investment and the Czech business environment is, to some extent, internationalized, the question offered is whether the Czech business environment can fully exploit this potential.

Can the Czech business environment fully absorb the spillover effects to take on technology, know-how and human capital management from successful foreign companies? The emergence and absorption of these benefits are conditioned by the flexibility of domestic firms, banks, governments and the overall situation in the local business environment, which are then shaped by a system of institutional conditions, including, but not limited to, investment incentives.

Utilizing the potential offered by FDI localization of multinational companies is subject to many factors, especially the size of the host market and the level of competition there, the absorption capability of domestic firms, the adaptability of workers, the institutional environment and other factors. (Szent-Ivanyi and Vigvári, 2012)

This paper deals with the determination of the absorption capacity of domestic companies. The six selected Czech regions illustrate to what extent the Czech local business environment can benefit from the presence of foreign companies. In addition, to what extent there is technology transfer and to what extent the presence of foreign firms can be seen in terms of productivity growth.

2 Mutual position of local firms and FDI

Evaluating the business environment at a lower regional level is very difficult, especially due to complicated data collection, as some types of information are only reported at the national level. The second problem in assessing the regional business

environment is clear from the macroeconomic concept of the competitiveness of the states, which cannot be fully applied to the regional level. Camagni (2009) argues that some laws that apply in international trade, do not work at a lower than national level. Unlike the state level, exchange rate differences, and changes in price and wage ratios at regional level either do not exist or do not work. On the other hand, the shift of production factors (labor, capital) between regions can pose a real threat to the regions.

Individual authors assessing the business environment at a lower regional level explore different aspects of regional competitiveness. However, there is a uniform agreement on the perception of productivity as a key indicator of the competitiveness of the regions. Kitson et al. (2008) discusses looking at productivity from an economic and regional point of view. They realize the extent of this concept however perceive productivity as an important indicator of regional competitiveness. This is confirmed by Gardiner B. et al. (2004), who analyzed productivity in the European regions, in terms of the effectiveness of the workforce.

In the original neoclassical models, such as the Sollow Growth Model, foreign investment is considered to be one of the capital resources, but they do not pay more attention to the effects (Srholec, 2014). The theory of endogenous growth, unlike Sollow's Model, is embedded in the production function of external effects on knowledge and technological change. For example, Romer's (1986) Model explores "learning by doing," whereon, knowledge is a public good, when the author assumes that it cannot be kept secret. Creating knowledge in one business eventually spills over into the whole economy, creating the spillover effect.

According to Lucas (1988), the dynamics of economic development is linked to the supply of human capital. In this context, Lucas mentions the effect of the migration of skilled workers, because a sufficient number of qualified employees is an important localization factor for companies producing high added value goods.

Fagerberg (1987) a Verspagen (1991) criticize theoretical approaches, which are based on production functions and their modifications. They consider them to be too formalized. These authors interpret economic growth a result of technological absorption capability and the size of the technological gap. Technological absorption capacity is considered a key factor in the reduction of the technological gap between the investor's country of origin – FDI provider and FDI recipient. For, with significant technological gaps, FDI can function as "cathedrals" in the desert. In this case, they are large production plants, using relatively advanced technologies (cathedral), with a low number of links to the host region (desert). Successful dissemination of knowledge (spillover effect) can be considered to be regions without the dominance of these individual actors (cathedral), respectively regions with a dense network of links between entities.

In case of a significant technological gap, there is no positive spillover effect. Due to the size of the technological gap, the isolation of FDI will cause workers to disseminate their knowledge and experiences, which can be caused by a fundamental separation of production and conceptual processes, when the branch is fully subordinated to the headquarters in the parent economy. Massey (2007) sees a solution in providing a varied structure of job functions at all skill levels. But there is another question on whether there is a correlation between the qualification structure and the employers' requirements in the host labor market.

The technology gap is closely related to domestic firms' absorption capacity. Szent-Ivanyi and Vigvári, (2012) talk about

the technological competence of companies in the host market; whether and to what extent the local business environment is able to absorb foreign technology. This technological competence can be measured, for example, by the emergence of subcontracting chains or the innovative activity of domestic firms.

Absorption capacity is defined as the ability to acquire knowledge created by someone else and to modify it for their own business needs (Narula and Marin 2005). It is also considered as another determinant of indirect FDI effects (Narula, 2017). Absorption capacity expresses the overall level of the region (Xu, 2000), as well as the technological level of a given territory, infrastructure, cultural and social capital, financial institutions and other institutional factors affecting the business environment on a given market (Griffiths and Sapsford, 2004). But the key attribute is the level of human capital, because, on the one hand, the FDI inflow creates the potential for technological transfer to the domestic business environment. On the other hand, the level of human capital in the local labor market determines, how much and what structure of foreign companies can be attracted to the region and logically, to what extent are capable domestic companies, respectively, home business environment to absorb (absorb) technology transfer (Fifeková, 2008).

3 Methodology

E_{FDI} is the number of FDI employees who have gained investment incentives in particular regions. E are employed people, according to Czech Statistical Office classification and statistics (Czech Statistical Office, 2018). As noted above, the size of the gap is one of the major determinants of spillover effects, along with FP.

In order for the FP region to grow its productivity and grow economically, it must, first of all, prove its high openness abroad, i.e. to be able to attract a sufficient number of foreign companies with high productivity that are willing to create as many new jobs in the region. Second, the region must be able to exploit the intensity as much as possible. It is, therefore, important to monitor the level, and the capacity of the region to use FP. It would be interesting to look at the extent to which, ceteris paribus, the region from the average FP unit can win productivity growth. The average FP unit is the average FDI productivity per FDI worker in the given year. Such an intensity indicator can be described "indicator of the intensity of use of the foreign presence in the region under survey," or otherwise known as the intensity transfer (IT).

To monitor the region's capacity to intensively exploit and effectively absorb the FDI technological possibilities, it is possible to examine the shift in productivity in the surveyed region only as a function of the technologically advanced country from which the FDI came (country productivity) and in what proportion they invested (the number of jobs). It can be said that if the region has achieved relatively high productivity growth, with the participation of a small number of foreign firms, with a small number of jobs created by them in the region, this region was, in other cases not considering factors, ceteris paribus, more successful in the intensity of transfer of the technological level of foreign companies to the region (in the absorption of this level). To monitor this ability to "absorb," a technological level can serve, for example, as the equation for an indicator in which the productivity of the region will be read in the given year. The weighted average productivity of foreign firms will be in the denominator, where the weights will be represented by the individual shares of employees of these companies, again for the year under review.

The constructed IT indicator can be calculated by the following relationship (2):

$$IT_n = \frac{AP_{Li}^{reg}}{\sum (AP_{Li}^{FDI} FP_i^{reg}) / \sum FP_i^{reg}} * 100 \quad (2)$$

Where AP_{Li}^{reg} is the productivity of the region in the given year n. AP_{Li}^{FDI} is the productivity of foreign companies of the given country (OECD, 2017) (expressed as the FDI producer's country of origin) in the year n. FP_i^{reg} is the share of employees of foreign companies in the given country, in the surveyed region of year n.

For a given IT indicator, the higher the value, the more the region is able to absorb the experience and possibilities of technological growth of companies from abroad.

To assess the overall capacity of the region to absorb the technological potential offered during the monitored period, i.e. the evaluation of the monitored trend, it is possible to use the indicator of the average IT growth factor or the modified IT indicator (IT_{kn}). In this case, in the numerator of the formula, instead of the annual productivity of the region, the year-on-year change in the region's productivity (i.e. the absolute annual increase in productivity) - see the equation (3):

$$IT_{kn} = \frac{\Delta AP_{Li}^{reg}}{\sum (AP_{Li}^{FDI} FP_i^{reg}) / \sum FP_i^{reg}} \quad (3)$$

is the year-on-year change in productivity of the surveyed region.

The built-in IT indicator works with relative transmission capability (absorption) technological levels in the region. The indicator evaluates the degree of recovery – intensity – opportunities to take over the technological level of foreign firms by individual regions (regions). For the best region's economic development, leading to the region's productivity growth, the ideal state is the high level of both extensive and intensive growth.

It is necessary to point out again that the given indicator has several assumptions that are necessary for interpretation. The main two are mainly:

- 1) It does not take into account other factors of productivity growth (i.e. growth factors, which can be caused, for example, by the growth of the technological advancement of Czech companies without foreign influence or external factors of economic growth – growth or decline of macroeconomic indicators in the country, changes in institutional conditions,
- 2) Abstracts from interaction on productivity growth between regions. That is, one region is the technological "locomotive" of the other region or vice versa.

FDI effects are examined in a sample of six regions of the Czech Republic. Respectively, impacts of FDI effects are identified within the business environment of the Pilsen, Carlsbad, Ústí nad Labem, Liberec, Hradec Králové and Pardubice regions (at NUTS 3 level). The common characteristics of these regions their border positions and the neighboring of regions.

It is difficult to identify the effects of all FDI because of the lack of relevant data, but it is possible to rely on CzechInvest's resources, which files projects from foreign investors – applications for investment incentives. The main source of data was statistics issued by the CzechInvest on investment incentives provisions (CzechInvest, 2018). A secondary source are the financial statements and annual reports of foreign companies that have received a promise of investment incentives (Ministry of Justice, 2017). From the CzechInvest evidence (2018), a list of FDIs were obtained, including information on regional location, investor's country of origin, promises of the number of newly created jobs and other information. This information was subsequently extended by data on the number of employees obtained from the annual reports provided by the analyzed company for each year of the analyzed period. The calculations were made between 2002-2014; long enough to track the trend.

4 Calculation of the transfer intensity of a foreign presence

In this chapter, attention is focused on the calculations and evaluation of the RRTG development in the selected group of regions. In terms of countries of origin, FDI investors in the analyzed regions are dominated by Germany and the United Kingdom (UK). Investors from these countries were represented in all regions. The development of labor productivity during the monitored period is shown in Table 1.

Regions	2002	2003	2004	2005	2006	2007	2008
Pilsen	14.72	16.13	17.56	17.48	19.62	20.63	20.15
Carlsbad	13.28	13.57	14.5	14.59	15.5	17.17	16.76
Ústí nad Labem	14.39	15.71	16.73	17.75	19.04	20.54	20.47
Liberec	14.36	14.17	14.84	16.57	17.88	18.58	19.18
Hradec Králové	14.21	15	16.97	17.04	18.1	19.96	20.57
Pardubice	14.84	15.56	16.46	16.94	18.82	20.13	20.53
Regions	2009	2010	2011	2012	2013	2014	Mean
Pilsen	21.4	20.75	21.2	21	21.84	24.24	19.75
Carlsbad	17.72	17.42	17.55	17.88	18.38	18.25	16.35
Ústí nad Labem	21.99	20.99	21.1	21.88	22.09	21.81	19.58
Liberec	19.28	19.42	19.82	21.5	21.59	21.75	18.38
Hradec Králové	20.73	20.96	20.91	21.02	21.79	23.86	19.32
Pardubice	20.57	20.66	21.33	20.5	20.46	20.57	19.03

Tab. 1: Developments of labor productivity in the surveyed regions

Source: Own processing based on data from the Czech Statistical Office

The table shows that at the beginning of the monitored period, the Ústí nad Labem region was ranked third in the region's survey of productivity. But, during the increasing inflow of foreign investment with an investment incentive, it maintained a leading position, along with the Pilsen region. This fact clearly confirms how vital it is for a region with economic and social problems to be able to offer investors the right conditions for doing business, for example, in the form of investment incentives.

4.1 Transfer intensity for the Pilsen region

The values of the transfer intensity for the Pilsen region are given in tab. 2. The dynamics of this indicator's development is then graphically illustrated in figure 1:

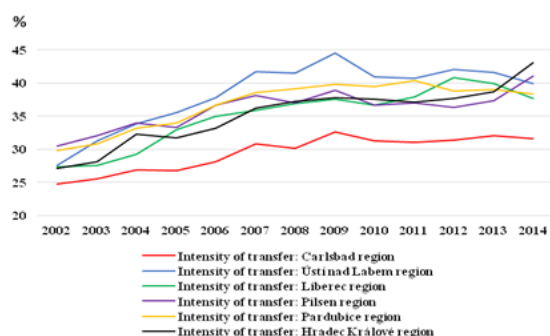


Figure 1: Comparison of the intensity of the transfer in the surveyed regions

Source: own processing based on own calculations and data from OECD, CZSO and annual FDI analysis

The Pilsen region is expected (given its strategic position, it enjoys spillovers from well-developed Bavaria, due to its short distance, above-average level of infrastructure with Bavaria and long-term cooperation between entrepreneurial environments)

the intensity of the transfer, relative to the other regions over the whole monitored period, is relatively high. It reaches thirty or more percentages over the entire period. However, the dynamics of IT growth is average or below average. This result is given by the relatively higher economic base of the Pilsen region, relative to other regions compared.

Year	IT annual productivity change (%) for Pilsen region	Growth coefficient of Pilsen region	IT annual productivity change (%) for Carlsbad region	Growth coefficient Carlsbad region
2002	0	-	0	-
2003	3	1.052	1	1.034
2004	3	1.059	2	1.052
2005	0	0.98	0	0.997
2006	4	1.102	2	1.049
2007	2	1.039	3	1.094
2008	-1	0.969	-1	0.977
2009	2	1.054	2	1.084
2010	-1	0.942	-1	0.96
2011	1	1.008	0	0.991
2012	0	0.981	1	1.012
2013	1	1.028	1	1.021
2014	4	1.101	0	0.986
Geographical mean		1.025		1.021

Table 2: Transfer intensity indicator for the Pilsen and Carlsbad regions

Source: own processing based on own calculations and data from OECD, CZSO and annual FDI analysis

In order to exclude the influence of the overall starting level of the region's economic maturity, it is appropriate to evaluate the development trend of the surveyed indicator on the basis of its year-on-year changes, to work with a year-on-year change in productivity in the region, measured by an appropriate trend indicator. Such indicators can also be considered, in this case, to be annual growth factors for IT. From these, the average growth factor can be determined (IT_{kn}).¹ The average growth rate of IT in the Pilsen region was positive in the period under review of 1,025. It can be said that the Pilsen region managed to maintain an increasing rate in the ability to absorb the technological level of the foreign companies during the mentioned period, at ceteris paribus. However, this growth rate was below average over the other regions surveyed.

4.2 Transfer intensity for the Carlsbad region

The transfer rate values for the Carlsbad region are listed in Table 2. The dynamics of the development of this indicator is then graphically illustrated in Figure 1.

During the whole period, the region reached relatively low levels of foreign presence utilization, the worst of the monitored regions. The unfavorable position of the region is caused by low foreign presence and also from the low ability of the region to use the opportunity. The region is not capable of extensive or intense growth, using of foreign presence in the region. This conclusion further underlines the weaknesses of the labor market, and emphasizes the non-use of its potential and the comparative advantage of the region (economic diversity, convenient geographic position, low cost of work nearby Germany).

A very similar, not entirely positive, conclusion can also be reached about the indicator of the transfer intensity, in the year-

¹ geometric mean annual growth coefficients of IT

on-year changes in productivity growth, see Table 2. Relative comparisons for the region are no longer negative, as in the case of absolute values of productivity. It is confirmed that the low productivity level region can absorb the technological gap, although smaller than the region, with a higher economic level (due to insufficient use of the region's comparative advantage, less economic experience and the ability of business entities to work with opportunities from abroad), however, the effect on productivity (i.e. its growth) is relatively higher due to a lower productivity starting base.

4.3. Transfer intensity for the Ústí nad Labem region

In spite of its negative media image and socio-economic problems, the Ústí region managed to attract a relatively broad spectrum of foreign companies in the period under review, which created a relatively high share of jobs in the region. In addition, the region is able to use the FP quite intensively, according to the results of the IT indicator. It is very positive that the indicator has managed to grow, in the crisis period, to one of the highest values among the surveyed regions (44%) and has since kept its value above the 40% - see Figure 1.

If the values at the end of the reference period were not in a downturn, compared to other regions (loss of growth dynamics between 2010 and 2014), the region would be a clear leader among the surveyed regions. This final statement also confirms and better describes the development of the transfer intensity calculated using year-on-year productivity changes, see Figure 2. The high level of the IT indicator, given the low level of the educational structure in the region, is provided, above all, by the quality regional policy and the mutual consistency between domestic and foreign firms.



Figure 2: IT indicator - annual productivity changes for the Ústí nad Labem region

Source: own processing based on own calculations from OECD, CZSO and CzechInvest data

The IT figures (year-on-year productivity changes in the region) clearly show that at the end of the reporting period, the region was unable to take advantage of the opportunities for growth. There may be several reasons for this: external factors, change of IP priorities, reduction of regional activity and others.

4.4 Transfer intensity for the Liberec region

The values of the transfer intensity for the Liberec region are again shown in Table 3 and Figure 1.

Looking at this data, it can be concluded that in comparison with the other regions in the monitored set of regions, the Liberec region's transfer intensity was at a low level during the whole monitored period.

Year	IT year-on-year productivity change (%) for Ústí nad Labem region	Growth coefficient Ústí nad Labem region	IT year-on-year productivity change (%) for the Liberec region	Growth coefficient Liberec region
2002	0	-	0	-
2003	3	1.131	-0.4	1.012
2004	2	1.08	1.32	1.058
2005	2	1.052	3.44	1.129

2006	3	1.064	2.56	1.061
2007	3	1.104	1.35	1.026
2008	0	0.995	1.15	1.026
2009	3	1.071	0.19	1.018
2010	-2	0.92	0.26	0.978
2011	0	0.994	0.77	1.034
2012	1	1.031	3.19	1.076
2013	0	0.99	0.17	0.977
2014	-1	0.959	0.28	0.944
Geometric mean		1.031		1.027

Table 3: Transfer intensity indicator for Ústí nad Labem and Liberec region

Source: own processing based on own calculations and data from OECD, CZSO and annual FDI analyzes

The region, however, cannot use a relative high level of internationalization (measured by high level of FP), interest from foreign companies. This fact is reflected in the business environment, with low cooperation between domestic firms in the region and incoming foreign companies. Foreign firms are not fully involved in the business life of the region, or they mainly orient their supply-chain chains outwardly and domestic businesses are only subcontracted to a lesser extent. The ability of domestic enterprises to engage in the production networks of foreign firms is related to their absorption capacity - the ability to absorb technology transfer. The constructed IT indicator quantifies, given the simplified assumptions set out above, how far the regional business environment is capable of absorbing technology transfer, respectively. It is a simplified relative indicator of absorption capacity.

Very similar conclusions and evidence on the productivity growth's fluctuating rate, due to the low intensity of the use of the foreign firms' presence is documented in Figure 3, which refers to the intensity of FP use, related to the year-on-year change in productivity.

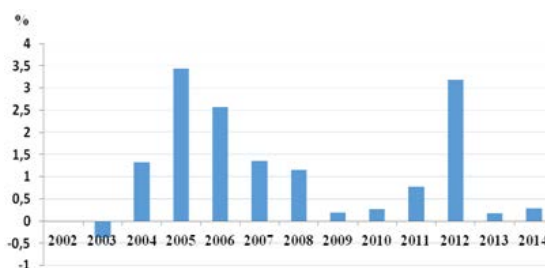


Figure 3: IT indicator - Year-on-year productivity changes for the Liberec region

Source: own processing based on own calculations from OECD, CZSO and CzechInvest data

As the region recorded a modest but steady productivity growth throughout the period, the values of the indicator for the whole period after 2003 are positive, but they are relatively low compared to the other regions. The value of this indicator never exceeded 35% over the whole surveyed period. Growth in regional productivity must be pulled higher than the other regions by domestic economic operators.

4.5 Transfer intensity for Hradec Králové region

Figure 1 shows a very positive finding for the Hradec Králové region, whose transfer intensity indicator value remained constant or increasing throughout the monitored period. This suggests that there is an increasing absorption capacity of the business environment in the Hradec Králové region, that is, the growing ability of the participating economic entities to take advantage of opportunities to absorb the benefits from abroad.

Due to the fact that a large number of foreign companies did not operate in the region (it is indicated from the low level of FP), it can be said that the region managed to attract, mainly to the region, companies with a high degree of consistency of trade relations and a high degree of subcontracting between foreign companies and domestic enterprises. The high dynamics of the increase in the rate of foreign participation utilization in the region also confirms the values of the modified IT indicator, which are presented in Table 4.

Year	IT year-on-year productivity change (%) for the Hradec Králové region	Growth coefficient Hradec Králové region	IT year-on-year productivity change (%) for the Pardubice region	Coefficient of growth of the Pardubice region
2002	0	-	0	-
2003	1	1.036	1.4	1.035
2004	4	1.15	1.8	1.076
2005	0	0.983	1	1.024
2006	2	1.048	3.7	1.079
2007	3	1.088	2.5	1.054
2008	1	1.029	0.8	1.012
2009	0	1.017	0.1	1.019
2010	0	0.99	0.2	0.992
2011	0	0.99	1.3	1.019
2012	0	1.015	-1.6	0.963
2013	1	1.027	-0.1	1.007
2014	4	1.112	0.2	0.98
Geometrical mean		1.039		1.021

Table 4: Transfer intensity indicator for Hradec Králové region and Pardubice region

Source: own processing based on own calculations and data from OECD. CZSO and annual FDI analyzes

4.6 Transfer intensity for the Pardubice region

The Pardubice region recorded the most stable level in the surveyed indicator. The region managed to improve or maintain its ability to absorb benefits from abroad (by 2011) at a steady pace in the period under review. The negative thing is that this trend has fallen since 2012 and the region has never reached an IT level of more than 40%. The regional business environment can absorb 40% of each foreign capital unit. The development is again clearly shown in Figure 1.

Due to the location of the region, the indicator's small value can also be attributed to a lesser degree of experience with domestic subjects cooperating with foreign companies, particularly regarding border regions. This experience can be expected, at least, to a lesser extent.

Stability in the indicator's development and low growth dynamics will further enhance and confirm the view of IT values computed over the YoY changes in productivity - see table 4.

The comparison between that Pardubice Region and Hradec Králové region is also interesting. While the Hradec Králové region had the best IT indicator, compared to all regions, the Pardubice Region was at the back of the comparison.

5 Conclusion

The built-in IT indicator illustrates the degree of internationalization of the business environment examined (thanks to the incorporation of the degree of foreign presence) and reflects the degree of absorption capacity of the business environment, to receive and exploit this degree of internationalization, and to what extent the impact of foreign companies is reflected in productivity growth.

The calculations performed showed that all regions achieved positive average IT growth factor values, i.e. that the whole group of regions was able to absorb, to a greater or lesser extent, the technological growth opportunities brought to them by the

analyzed foreign companies in the region. The highest values of the indicator, in the relative conception of the studied regions, reached the Ústí nad Labem region, where significant fluctuations in values were recorded. An outstanding development trend has been identified in the Hradec Králové region, which has been able to maintain a constant or rising value throughout the period. This indicates the increasing absorption capacity of the business environment in the Hradec Králové region.

In the Hradec Králové region, the productivity growth is mainly caused by the intensity of the use of a relatively small number of companies from abroad in the region. These companies employ a relatively small proportion of employees. The highest value of the indicator, in the relative concept among the studied regions, was reached by the Hradec Králové region. The Carlsbad region has the lowest value. In the Carlsbad region, both the absolute IT indicator value and the relativized (modified) value of the indicator were low. The Ústí nad Labem region also achieved a relatively high IT value (the average IT growth factor was 1.031). The Pardubice region achieved a surprisingly low value (average growth coefficient - 1.021), which illustrates relatively constant development without significant growth tendencies in the absorption capacity of the business environment. All regions then achieved positive average IT growth factor values. It can be said that all regions are able to use the technological growth opportunities more intensively, which could bring to foreign companies in the region. This result is probably due to the region's growing experience, in terms of cooperating abroad and the penetrating foreign companies. This claim also corresponds to rising FP values.

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Primary Paper Section: A

Secondary Paper Section: AH

CONCEPT OF WORKING WITH MISTAKES IN THE EDUCATIONAL PROCESS

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Abstract: This paper discusses modification of teaching strategies used in the educational process. In their work the authors focus on development of the students' metacognitive skills in the educational process and mainly underpin strategies that work with mistakes commonly made during the learning process and the course of instruction.

Keywords: metacognition, mistakes, strategy, mental map, misconception.

1 Introduction

Teaching strategies in the educational process represent key aspects of contemporary education. They must be in the centre of attention because they encourage increasing the effectiveness of the educational process.

In the first place, teachers should find out *how* their students learn, *how* do they remember information, *how* do they plan their studying, retrieve information from their memory and *how* do they decide, think and use individual cognition processes.

The contemporary education system could be mainly criticized for focusing on educational outputs and not on the process that takes place during acquisition of knowledge. Students are not led to systematically study from one class to another. There is not enough room for repetition of topics; the teachers concentrate on identifying mistakes with no follow up on these during further instruction.

The contemporary education system increasingly prioritizes use of ready-made information before the time-consuming process of individual retrieving and working with information by the students. The existing teaching and learning environment in our education system is far from corresponding to current needs and is a total mismatch to the educational requirements of the near future. Slovakia scores behind other European countries in international testing and lags behind in the use of innovative trends in pedagogical practice.

We believe that the structure of the educational process should systematically keep the brains of students busy. In spite of recent developments in the field of education and the use of modern didactical concepts of education, many students continue to struggle when selecting suitable learning strategies. As Schraw (1998) describes, individual strategies based on the enhancement of students' metacognition allows for compensating of deficits in general intelligence.

Many students do not have full-fledged learning/study strategies. As a result, they do not know how to study efficiently; are unable to solve problems presented in education; do not complete tasks; and have bad study plans. However, there are also students who have mastered a wide spectrum of learning strategies that allow them to effectively study and successfully plan their educational activities. The fact is that individual teaching strategies are always influenced by the students' attitudes combined with their metacognitive disposition. This opens room for active intervention by a teacher. It is up to the teacher to use the widest spectrum of effective teaching strategies in their classes. Students will then be able to choose from a broad spectrum of presented strategies that are the most suitable from the point of view of the subject or topic of study.

It is quite unfortunate to think that within today's educational reality memorizing and transmissive teaching will prepare the students for the modern world. There is an overload of information in our societies. If we want the pupils and students

to succeed in the future we need to encourage them in critical thinking and adequate responses to emerging situations.

We believe that development of critical thinking in students has an essential impact on their learning process since it is primarily a *system* (focusing one's attention on logical connections, organization/structuring of information); metacognition (improvement of one's own thinking method); questioning; natural curiosity; working with mistakes; development of higher intellectual operations and activity. Summarization of scientific perspectives on critical thinking has led us to conclude that critical thinking actually means deliberating about information (to understand it, to make conclusions) with a certain intention (to achieve a result, solve a problem, complete a task, achieve a set goal).

2 Mistakes in educational process

Even small children are told that making mistakes is a bad thing. Over the years, everybody comes to the conclusion that only knowing the correct answer leads to good grades, success and right-life decisions. On the other hand, making mistakes represents a natural part of human life, since erring motivates humans to do things differently, better, more successfully. It is of paramount importance that both students and teachers in the educational process understand the principal difference between a goal to *learn something* and to *perform*.

Many students see mistakes as a threat to their self-image; thus they tend to focus only on those activities they have mastered well so that they are sure not to make mistakes, to work hard or even to think when performing these tasks. Students, teachers or parents interpret a mistake as if they acknowledged a lower level of competency. In all educational activities there is too much focus on evaluation of performance but little attention is paid to further development of knowledge and competencies of the students. Often, students are forced to hide their mistakes rather than cope with them, acknowledge them; to understand why they have happened and how to work with them.

Working with mistakes represents an integral part of each and every learning and teaching process. Mistake identification and its interpretation should be the baseline assessment technique as well as self-assessment technique. Our educational environment continues to see examining a mistake as mostly a negative thing. Čáp (1997) notes that making mistakes is a regular occurrence at the beginning of every learning process. The teachers must refrain from perceiving mistakes made by the students as a sign of their incapability, personal traits or lack of motivation. The teachers must be able to work with these mistakes and use them for the benefit of both the teacher and the students.

The recommendation of Helus (2001) can be seen accordingly. He suggests that an educational system needs to cease focusing on negative assessments. The author believes that pointing to students' mistakes can lower their self-assessment. Instead, attention should be paid to identifying a mistake at the beginning of the educational process so that it does not get anchored.

Making mistakes is a regular event at the beginning of almost each learning and teaching process. The teachers should be able to work with students' mistakes and use them for improvement of the further course of instruction. Identifying mistakes in natural sciences (mathematics, physics, and biology) or languages is easy but to identify, analyse and interpret incorrect thinking or judgement is a relatively demanding exercise. Moreover, teachers can also err, for instance in students' assessment, when they do not precisely follow the pedagogical norms or are not sure if the performance of their student is correct or not. In such instances, the space for so-called *creative mistakes* opens when the teacher should let the students explain their thinking or the procedure they have used. Then they should

discuss things that are not clear, interpret them, and concentrate on questioning and thorough analysis of the discussed matter.

Mistakes always open a new perspective on problem solving and tasks and offer new experience that both the teacher and students can utilize in planning further steps. Mistakes should be primarily seen as indicators of gaps in the learning process. By no means should students be punished for their mistakes, neither through assessment or verbally – it would only cause them to be afraid of potential intimidation. When a student actively tries to identify mistakes and corrects them, he or she gathers new knowledge for further studies.

2.1 The concept of working with mistakes education

Didactics of education is closely linked to working with mistakes. A goal-oriented didactical approach focused on goal achievement offers detailed specification of performance requirements that makes identification of mistakes easy. With a didactical approach focused on activities, there are usually no or few performance requirements, which makes the identification and analysis of mistakes more of a comprehensive exercise (V. Kosíková, 2011, p. 139)

Each mistake needs to be identified and corrected at the very beginning of the learning process. If a student internalizes an incorrect meaning and then reuses it, reversing and correcting such an *established* (rooted mistake) becomes a long term, not always successful process. Thus, teachers need to use feedback and monitoring of their students during the educational process. Each student reacts differently to information about a mistake and its correction at the beginning vs. the end of the learning process. At the beginning of the learning process, concepts do not yet have a stable position and their mutual positions/interconnections are only being identified and explained. At this stage, a possible mistake is not deeply rooted, which makes it easier to eliminate it. In the course of learning students continuously work with new concepts; practice and repeat acquired knowledge; thus a wrong piece of information may become a part of an established and reinforced knowledge structure.

Four basic steps need to be considered in working with mistakes: mistake identification; mistake classification (looking for causes, accidental mistake vs. not understanding of a subject, assessment of its gravity); mistake explanation; and interpretation and mistake correction. In traditional schooling, the more mistakes a student makes, the worse grade he or she gets. This reinforces a stereotype: mistake = failure (and subsequent reprimand). When students invest all their thinking into their failures and wrongdoings they have no room to think how to fix things. As a result, they repeat the mistake since they do not know what to do in a situation where the mistake has already happened. It is wrong when teachers punish their students for their mistakes since it only brings fear and efforts to avoid similar failure. This organization of teaching, focused on mistakes, can only result in further erring and failing. A proper focus on correcting mistakes, however, allows understanding mistakes as integral part of the learning process that can be used to the benefit of an individual student and all students.

Analysing mistakes always leads to a profound experience that enables students to better remember new knowledge. Every teacher should always use mistakes as a learning tool. The teachers should encourage their students to identify mistakes on their own, try to explain why they made them and interpret the subject matter in such a way that they avoid making mistakes in the future. That requires an explanation of mutual relations among things and logical connections. Mistakes in the learning process should be welcomed for their high information value about the real level of students' knowledge. The saying *learning from mistakes* is not purposeless. This approach to instruction also supports trust, cooperation and joy from the work between students and teachers.

Traditional instruction is literally fighting mistakes. They are always identified as *unwanted events* that result in a lower score in written exams and potential mockery from classmates. The teachers are upset when students make mistakes and often they take it as a personal failure. Students involuntarily end up in a situation when they would rather do nothing than make a mistake; notwithstanding when the same mistakes repeat over again or teachers are afraid of making a mistake in front of their students. Teachers tend to be more focused on identification of mistakes and their correction and not their cause and thorough elimination. The community of parents also believes that mistakes are essentially unwanted phenomena.

A mistake, nevertheless, is a much more complex attribute that activates and encourages independent thinking in students. We should therefore focus on identifying causes of mistakes, not the mistakes themselves as this will support progress of both students and teachers. It is of no help to a student if a teacher only corrects his/her mistake and pays no more attention to the matter. Mistakes must not deter or scare the students; they should be perceived as a useful experience. If a student errs and feels bad about it, or is even afraid, the teacher should offer encouragement and admit he/she sometimes makes mistakes, while always trying to identify the cause leading to that mistake. It is actually appropriate when a teacher thinks aloud and analyses the causes of a mistake. The students then see possible ways of working through mistakes. Whenever a mistake occurs, it is a teaching opportunity because mistakes support and develop a search for alternative solutions, divergent thinking and creativity.

Slavík (1999) differentiates between a normative and creative mistake. A normative mistake is a certain deviation from standardized performance that is considered to be correct. A creative mistake represents a rigid perspective on each and every idea of a student that contravenes his/her requested performance. Humanities use analysis, correction and assessment of incorrect performance by students as a tool allowing for comprehensive assessment of the knowledge system of individual students.

3 Mental mapping

Illustrating knowledge through visual systems is a technique used in education from the ancient times. Since 1972 it has been used as a tool for examining significant changes. In 1965 it was a German pedagogue, Richter, was the first one in the European geopolitical context to examine how the subject of teaching is structured. Graphic organizing of concepts and their mutual connection is nowadays most often connected with J. D. Novak (1998).

We primarily believe that each educational activity should first and foremost contribute to and facilitate organizing of the students' thinking; namely structuring of the concepts the student uses. Individual knowledge of human beings is based on a strong semantic network connecting individual concepts into patulous mental concepts. These concepts are created through connecting individual concepts (a concept represents an idea about its content) with those already existing in the network with new concepts.

Graphic organizing of concepts and their relations into a visual form is called mental mapping. When working with a map, the process of map creation is much more important than the final mental map since working on the mental map enhances key competencies including: problem solving, learning (ability to define main idea and prioritize other ideas), social competence, and personal and communication competence.

Mental maps can be used in almost all subjects and all stages of a class. They can serve as learning motivation; an innovative way of evaluating teaching performance or as review when a study area is completed. Mental maps can be analysed from various perspectives. When a mental map is created, the student is an active participant in the instruction. Moreover, the student can contribute with an important personal perspective into the

structure of a text. Mental mapping can be used in all areas of instruction, though it is important to differentiate among different types of maps. There is not a map that would be universally applicable for all teaching materials.

3.1 Preconceptions and misconceptions

Conceptual learning – no doubt – is a challenging exercise. Contemporary education builds on the knowledge of cognitive psychology that pays long-term attention, for instance, to the formation and correct understanding of concepts in children. The concepts are units of individual mental structure, thus identification of results in conceptual learning has not yet been clarified. Identification of the internal knowledge system of a child – his/her understanding – is a challenge. Most frequently, the literature uses the terms *concept*, *student's understanding*, *student's idea*, *naive theory*, and *misconception*. The very last concept is used to define a student's incorrect understanding of a subject or its incorrect interpretation.

A human being is subject to various external influences from the early stages of life (culture, religion, economy, and social influence), endogenous influences (individual predispositions) and personal experiences. Information *collected* in this way in combination with knowledge, represent the personal internal knowledge system. This system can vary from person to person in terms of flexibility, structuralism and scope. The structure of an internal knowledge system represents its important component. It consists of association bonds among individual pre-concepts. The way the system is formed and semantic networks are established significantly unveils how we learn the content of individual concepts, how do we apply concepts in real life, and how we modify new concepts based on the preconceptions.

The form of understanding of any subject may change and develop over time. In this context, by understanding of a subject we mean the process prior to facilitation of the content of a specific subject in the educational process (preconceptions and working with them) during facilitation (the student first acquires new knowledge on concepts and their mutual relations), during facilitation (the student acquires new knowledge on concepts and their interconnections) and afterwards (reconstruction of previous knowledge, enrichment of an internal knowledge system by new generalizations, interconnections and concepts).

Richter (1998, p. 48) identified the main factors that impact a student's understanding of the subject: the authors of a textbook (low level of comprehensibility, text difficulty, uninteresting tasks), the students (low attention span during instruction, wrong teaching method), the authors of the curricula (wrong choice of subject area, ignoring links among subjects, wrong structure of the subject), the teacher (unstructured explanation, incomprehensible vocabulary and insufficient analysis of concepts, unpopular topic, reproduction of the subject).

In the words of Pupalá (2001, p.145), preconception is the first, unsorted idea created by a human cognitive activity; while a human being adjusts the world so that it is meaningful; preconceptions are coherent explanatory systems. Children develop their internal knowledge system from knowledge and information stored in long-term memory. It is a particularly rigid system since it builds on stable platforms of the child's cognitive processes. Some pieces of information stay there for the length of life, even if they are not necessarily true. Modifying an internal knowledge system of a child is therefore a very challenging and long-term process since the knowledge must be confronted with facts that prove it wrong.

There are many determinants behind creation of misconceptions, including personal experiences of each student, emotions added to specific information, mistakes in texts or textbooks, shortcomings of the home environment or prejudices and stereotypes.

We understand misconception as a wrong idea, incompatible with the current level of accepted scientific knowledge. It is obvious we need to identify students' preconceptions and misconceptions prior to instruction of a new topic. Teachers should be aware of this fact and deal with it. Moreover, they can use the students' preconceptions and possible misconceptions as a motivational factor during instruction. Motivated students can then, through individual pedagogic situations, work with their ideas, modify them and compare them with others. Students thus become the main creators and systemisers of their own internal knowledge system.

As stated above, determinants in developing misconceptions include mistakes in the text, in the school environment, mistakes in the textbooks, including factual inaccuracies and overly simplifying or incorrect explanations and interpretation of concepts when logical links among individual pieces of knowledge disappear. Often, students are presented only with summary tables or theorems they need to learn without understanding or deeper analysis. The number of topics for instruction is increasing but the length of a class and academic year remains unchanged. Subject areas are not challenging for their content but for missing associations, logical interconnections and links among individual topics. Students do not think about the subject, they just passively reproduce readymade knowledge, often in the same words their teacher had used in the class.

4 Empirical part

The empirical part of this paper is primarily based on psychopedagogical, meta-cognitive and neuro-scientific knowledge and perspectives on the process of instruction. There are only a handful of experts in Slovakia who systematically deal with those aspects of education who work with mistakes for the sake of developing metacognition within students. This paper is a contribution to implementation of metacognitive learning strategies into the educational process which will enable every student to further develop his or her current level of metacognition.

Metacognition is a concept that gradually has found its way into the awareness of teachers and psychologists and at much slower pace also to the lay public. Contemporary education pays attention to the metacognitive processes mainly in text comprehension. However, there is a need to gather more empirical data for implementation of metacognitive strategies and theories into curricula, teaching and instruction.

4.1 Research goal

The study aims to *create and verify a self-correction tool based on metacognitive formulations for working with a mistake*. The research problem identifies the level of impact of the self-correction sheet on the level of knowledge and competence of the students when working with mistakes.

The research problem and goal leads to the following hypothesis:

H1: *Use of a self-correction sheet will improve study outputs of the students in developing a corrected conceptual map.*

4.2 Research methods

The following tools were used for the purpose of the research: A *self-correction sheet* designed by the research team: it is a set of questions based on metacognitive formulations that work with a mistake. The self-correction sheet contains 24 questions in three basic subscales divided into the following categories: map construction, map content, and personal preferences. The categories contain the following items: map construction (time, map design, hierarchy, concepts, relations among the concepts); content of the map (study reference materials, notes from a class, substantive information on the subject, random mistakes, serious mistakes, careless mistakes); and personal preferences (stress,

learning style, subject repetition, interpretation of a mistake, work satisfaction, analysis with the students, fatigue, acknowledgement of identified mistakes, final map of concepts). The strategy for developing the self-correction sheet was relatively challenging since the sheet is based on metacognitive formulations while it was also important to consider age-related specificities of the students.

The applied research method was *experiment* – in order to apply and verify the effectiveness of the self-correction sheet based on metacognitive formulations in eliminating mistakes in the experimental group. The results of the students in the experimental group were compared with the results of the control group that did not have the self-correction sheet available during its class.

Test of conceptual mapping – the method of logical synthesis and analysis was used for evaluating individual conceptual maps of the students in the experimental group and in the control group. The evaluation criteria for collected data allowed us to score and sort the data into several areas. The criteria included: the frequency of concepts on the map; key words of the subject area; number of hierarchies on the map; meaningfulness of the conceptual map; and final visualisation of the conceptual map. The test of conceptual mapping and selected criteria were also applied during the post test. In both cases, the students constructed conceptual maps at their own discretion, having the opportunity to choose any type of a map: circle map, bridge map, flow map, bubble map, brace map, multi-flow map, tree map, double bubble map. Students in both the control and experimental group created non-structured maps since they had only received the central concept (a word), not a fixed list of concepts.

4.3 Sample characteristics

We expect that both levels of elementary education strive to fully enhance cognitive functions of the students. A child becomes a student at the secondary school level, being an adolescent, at the age when his/her attitudes to life, society, school and personal challenges change.

Our research focuses on secondary school/secondary grammar school students. There are multiple reasons behind this choice: first, we expect that secondary (grammar) school students have had found their study style and know which style fits them best and they use the most. Furthermore, we believe that older students have a more stable structure of knowledge; therefore their conceptual maps will contain more concepts, mutual connections, inter-subject links and hierarchies.

Our research population was a group of secondary school students and secondary grammar school students. The research sample was selected from among secondary grammar school students in Nitra. The research sample consisted of two classes, with representation of boys and girls. The total number of subjects in the sample was 60 students in two classes at the second grade of a four year secondary grammar school. The students were assigned to a control and experimental group by classes. To preserve the authenticity of the research, we did not mix the groups and the students were assigned to groups within a class. Thus, they studied from the same textbooks, with the same teacher and the same curriculum. The experiment was carried out once a complete subject area was covered.

Table 1: Research participants

Class	Total	Girls	Boys
2A	30	20	10
2B	30	19	11

4.4 Results

The chosen research method, considering the research goal – *to create and verify an self-correction tool based on metacognitive*

formulations for the sake of working with mistakes - was an *experiment*.

Based on a pre-test the students were divided into two groups: one group (class) was a control group and the other group (class) was a experimental group. The aim was to compare classes with very similar educational outputs, including the average score in written tests (no significant difference) or final score at the study certificate from the *history class*. The classes were similar, thus the overall output evaluation is comparable. Scoring of conceptual maps also did not find any significant differences in the quality of conceptual maps in individual groups either.

At the beginning of the experiment knowledge in selected area – *Slovaks in the Austro-Hungarian Empire* in both groups was only the knowledge acquired at elementary school. Therefore, we decided to repeat the topic through free associations. During instruction of the subject, a wide array of didactic methods was applied in both groups. The research team worked on diverse tasks with the students, discussed various issues, worked with textbooks, identified different locations on maps, worked with history articles, combined information with documentary films and power point presentations.

Individual students were observed during educational process for the needs of the self-correction sheet – how they think, type of connections they make in history subject, where the biggest gaps are, how they remember the curriculum more easily, why they cannot link some pieces of information together. Upon the completion of the topic, we asked them to do a pre-test of conceptual mapping.

After scoring and evaluating conceptual maps in both groups we identified students' mistakes, returned the conceptual maps to them, while in the experimental group the students also received the self-correction sheets to correct the identified mistakes. We were interested to find out if the criteria values or the final values in the conceptual maps would change more significantly with the self-correction sheet based on metacognitive formulations. The research then experimentally verified if the self-correction sheet designed to enhance students' metacognition improved their study outputs when outlining a corrected conceptual map when implemented into the educational process.

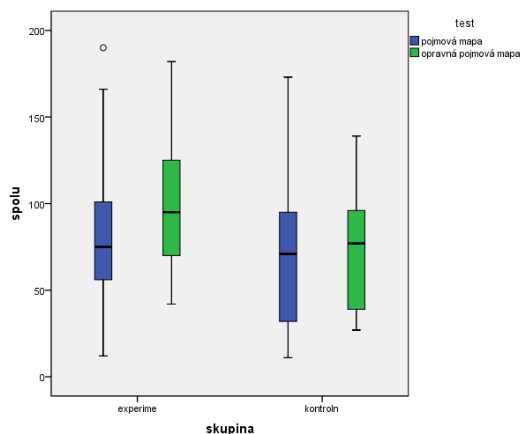
The next part of the study describes statistical findings. Hypothesis No. 1 (H1): *We expect the use of the self-correction sheet to improve the study outputs of the students when designing corrected conceptual maps* was developed into a statistical hypothesis that is to be statistically tested (using tests for mean values). The following assessment criteria were used as frequency indicators: frequency of concepts, number of hierarchies and total.

Partial hypotheses were chosen in order to find out and confirm similarities between the experimental group and control group. Both groups must have had a comparable score at the beginning of the testing otherwise the results would not be objective.

- H_{1.1}: Total post-testing score in the test group is different.
- H_{1.2}: Total pre-testing and post-testing score in the experimental group is different.
- H_{1.3}: Total pre-testing score in the experimental group and control group is the same.

The following boxplot demonstrates total score distribution (i.e. total number of points) for the conceptual map and corrected conceptual map in both experimental and control groups. Testing criterion "Total" is a quantitative representation of the success rate in testing.

Graph 1: Total score distribution



The quantitative variable (Total) in both experimental and control groups was compared through non-parametric Wilcoxon signed-rank test. Since there were 30 observations in each group, when the normality presumption was not met, we used the non-parametric Wilcoxon test against the Student's t-test. Prerequisites for means testing must be checked prior to testing and comparison itself. The following tables show test outputs for both groups.

Table 2: Normality test - Control group pre-test

Normality test				
Control group		Shapiro-Wilk		
Pre-test		Statistic	Df	Sig.
Total		0.938	30	0.079

Table 3: Normality test - Control group post-test

Normality test				
Control group		Shapiro-Wilk		
Post-test		Statistic	Df	Sig.
Total		0.938	30	0.079

Table 4: Normality test - Experimental group pre-test

Normality test				
Experimental group		Shapiro-Wilk		
Pre-test		Statistic	Df	Sig.
Total		0.961	30	0.335

Table 5: Normality test - Experimental group post-test

Normality tests				
Experimental group		Shapiro-Wilk		
Post-test		Statistic	Df	Sig.
Total		0.928	23	0.042

Individual calculations lead us to conclude that the normality assumption is met in six cases and violated also in six cases (see Table 6).

Table 6: Normality assumption - summary

Experimental / Group	Score	Normality assumption
Pre-test – Control group	Total	Yes
Post-test – Control group	Total	No
Pre-test – Experimental group	Total	Yes
Post-test – Experimental group	Total	Yes

Testing of the above statistical hypothesis at the level 0.05 (i.e. with 95% confidence) brought the following results described in the following explanations. Pre-test and post-test scores in relation to the control group needed to be compared for the sake of this paper. At the individual level, it is important to compare a student's results in pre-test and post-test. This makes individual

progress in pre-test and post-test equally important to measuring and statistical processing of the results of the whole group.

The quantitative variable (Total) indicates that post-test results in the control group and experimental group differ. Since a non-parametric test was used it is not possible to conclude if the result of the experimental group was better than in the control group. The average score in the experimental group was 101 while it was 76 in the control group; i.e. the average result shows the results in the experimental group should be better than the results in the control group. This hypothesis would have been confirmed if the sample size was bigger.

Pre-test in the control and experimental group was not different. Such an outcome was predictable since the conceptual maps of both groups were the same on average. As already described, we worked with two comparable groups (classes) with almost identical educational outputs in the *history* subject.

Pre-test and post-test results in the experimental group are different. The total post-test score is higher than the total pre-test score. The students in the experimental group corrected identified mistakes, thus achieving a better score. Their corrected conceptual maps contained more concepts with a higher level of meaningfulness.

The Pre-test and post-test score is different in the control group. The average post-test score was also a little higher than the average pre-test score. A potential explanation is the short time period between both tests.

The use of the self-correction sheet improved study outputs of the students when making corrected conceptual maps. There were significant differences in pre-test and post-test results in the experimental group. Individual improvement of each student in individual scoring criteria is an important result for the sake of design and verification of a self-correction sheet. The results show that all students in the experimental group demonstrated positive changes in most of the followed factors. This self-correction sheet, based on metacognitive formulations, was designed and experimentally tested in the educational environment. Since it is a certain type of a generic questionnaire not specifically bound to a selected topic or subject, it can be used with any course (subject). We would also recommend testing of the self-correction sheet with a larger research sample when students cover a more extensive thematic area. The contemporary education system does not focus only on acquiring knowledge but primarily on its quality, which potentially can be modified through enhanced metacognition in working with mistakes.

4.5 Conclusion

From the beginning of 20th century our school system has faced a long-standing problem – overloaded curricula and an encyclopaedia-like didactic approach. Fast technological, social and cultural changes in a globalized world unavoidably lead to adaptation by people to social developments and living conditions.

A metacognitive approach to educational practice does not only focus on performance but also on students' personal and social development. Taken from a metacognitive perspective, teachers often complicate the students' learning process, albeit unconsciously, rather than making it easier. Teachers must be informed about the ways learning and teaching mechanisms function and how to increase the learning effectiveness of their students.

We attempted to explore this area more profoundly, trying to explore students' capacity to work with mistakes and enhance their metacognitive capacities by doing so. Metacognition helps students to become active designers of their learning process and the constructors of their internal knowledge system. Metacognition of the students appears to have improved through

their work with mistakes when using a self-correction sheet in the educational process.

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Primary Paper Section: A

Secondary Paper Section: AM

RISK ASSESSMENT AND THE PREDICTION OF BREAKTHROUGH WAVE DURING A DAM ACCIDENT

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Abstract: With the use of modern methods of accumulated information analysis about the accidents on ground dams, it is possible to make the predictions concerning the probability of emergency occurrence and to calculate the possible consequences. The main reasons of subsoil dam destruction are the problems with ground bases or the lack of hydraulic structure capacity. The forecasting of a breakthrough wave expansion as the result of an accident was carried out using the example of the Nepokoevsky reservoir hydraulic structures in the Krasnopartizansky district of the Saratov region. In the event of a catchment structure destruction, the threat of the pressure front destruction is created, followed by the development of propane, through which the water front, spreading in the lower part of a hydraulic unit, forms a breakthrough wave and, thus, the territory flooding takes place. In order to predict a breakthrough wave and the flooding characteristics of the terrain during the break of hydraulic unit facilities, the "Volna" program (version 2.0) was used. In accordance with the classification of the Russian GTS Register, the level of dam safety is assessed as normal one, and the risk of a GTS accident occurrence probability is assessed as acceptable (permissible). According to the calculation results, the maximum flooding width will be 39.48 m on the right bank, the maximum depth of flooding will make 1.22 m at the distance of 0.95 km from the site of the hydraulic unit, the maximum speed of the wave will be 2.16 m/s at the distance of 11 km from the hydraulic unit site. At the distance of more than 23 km from the hydraulic unit site, the parameters of a breakthrough wave are within the permissible values, which do not cause destructive effect and any consequences of a negative nature.

Key words: forecast, dam, hydrotechnical structures, estimation, risk, breakthrough wave.

1 Introduction

According to statistics, the accidents and the damage of hydraulic structures on ground dams occur quite often. The causes of such accidents are various factors that could have arisen during design and construction stage or in the process of exploitation. The accurate causes of an accident, as a rule, are set after the emergence of an emergency. However, using the modern methods of different, already accumulated information analysis about the accidents that occurred, it is possible to make the forecasts concerning the probability of emergency occurrence and to calculate the possible consequences.

The main reasons of subsoil dam destruction are the problems with basement soils, or the lack of hydraulic structure capacity. The problems with basement soils are manifested when a reservoir is filled for the first time. An insufficient capacity is characteristic mainly for small-scale irrigation dams (Orlova S.S. 2016).

The lack of capacity is the result of a flood flow incorrect calculation, at which the water flow through a spillway and a drain is higher than the calculated values, and the structures can not cope with it; the malfunctioning condition of culverts during the passage of high water; dam accidents located upstream (O.V. Mikheeva, S.S. Orlova. 2014). Thus, water flows through the dam crest and its destruction takes place.

The most dangerous consequenced of a dam accident is the

breakthrough of the pressure front and the emergence of a breakthrough wave, which can lead to huge economic losses, environmental disasters and social consequences spreading in the tail-water of a hydraulic unit (F.K. Abdrazakov, T.A. Pankova, S.S. Orlova, and Sirota V.T. 2017).

An assessment of risk and possible consequences as the result of an accident was carried out using the example of the Nepokoevsky reservoir hydraulic structures in the Krasnopartizansky district of the Saratov region.

Nepokoevskoe reservoir is built on the dry land (the Nepoevsky vale), located on the right bank, the first terrace above the floodplain, in the upper reaches of the Bolshoy Uzen river. The dam is located 2.2 km from the mouth of the Nepoevsky vale beam (the confluence point in the Bolshoy Uzen river) and 2.4 km to the southeast of the village Podshibalovka. The reservoir is intended for the accumulation of the Volga water during the inter-irrigation period, coming through the water outlet of the main canal central branch (VMK-2) of the Saratov irrigation-watering canal named after E.E. Alekseevsky (SIWC) to the beam Nepokoevsky vale, the feeding of the Bolshoy Uzen river in order to cover the water deficit during the summer vegetation period when water is collected for irrigation and water supply.

The facility has been operated for 33 years. There were no emergency situations during the operation. The solidity class of hydraulic structures is the IIIrd one. Dangerous stored wastes are absent. By the degree of danger, the GTS refers to the third class, the safety level is normal.

The structure of the hydraulic unit includes (at present):

- earth structure made of heavy loams with layer-by-layer compacting, the length along the crest of 2,074 m; the crest is suitable for traffic, its width makes 10 m and it has an asphalt surface; the mark of the crest makes 100.90 m, the maximum height makes 25.9 m, the maximum pressure on the structure makes 24.05 m;
- a spillway construction of a closed type - a bottom outlet, regulated by deep gates; an entrance threshold mark makes 78.80 m, an output mark makes 77.30 m; the maximum culvert capacity with FRL (98.05 m) is 81 m³/s, with HWL (98.60 m) of 82.5 m³/s.

The purpose of the study is to assess the risk of its occurrence on the basis of the forecasted scenarios for the development of a hydrodynamic accident and to predict the propagation of a breakthrough wave as the result of a hydrodynamic accident on a ground dam.

2 Methodology

2.1 The prediction of accident development scenarios

The forecasting of a breakthrough wave, and an accident risk assessment was carried out on the basis of possible scenarios for a hydrodynamic accident development.

The list and the probability of scenarios for the development of hydraulic structure accident on a dam are determined on the basis of possible causes and the nature of GTS dangerous damage analysis that can cause emergency situations and hydrodynamic accidents (Kuznetsov D.V. 2016).

2.2 Accident risk assessment

The assessment of an accident risk level at the hydraulic unit is carried out by the analysis of the factor cumulative influence which reflect the degree of danger and the degree of vulnerability for a GTS (Korenovsky A.M., Baklanova D.V. 2016). At the same time, the degree of danger determining the characterization of the processes occurring on GTS and in the zone of their influence, and representing the threat to life, or to

the living conditions of people, facility and environment, is expressed by the hazard factor of an accident λ . The degree of vulnerability that determines the ability of GTS to lose its ability to perform specified operational functions as the result of negative impacts is expressed by the vulnerability coefficient ν . The assessment of GTS accident risk also includes the comparison of the results obtained with the acceptable level of a GTS accident risk, regulated by existing regulatory documents (Methodical recommendations for the assessment of accident risk at hydrotechnical structures of the water facilities and industry (Text) // 2nd edition, revised and supplemented, M. "DAR/VODGEO", 2009.).

The complex characteristic of the object is the assessment of the total risk, which allows to perform a comparative assessment of a situation from the perspective of possible losses for existing or projected facilities. The risk assessment is based on the results of hazard factor monitoring and analysis, most significant for a given structure and its operating conditions (F.K. Abdrazakov, T.A. Pankova, V.A. Shcherbakov. 2016).

Hazard indicators are divided into 4 groups: 1) the excess of the natural loads and impacts taken by the design substantiation of GTS structure; 2) the substantiation and the compliance of design solutions with modern regulatory requirements; 3) the compliance with GTS structure project, the technologies of erection and operating conditions; 4) possible consequences and damage in the case of an accident on GTS.

At that, each group of indicators is analyzed for main vulnerabilities with an expert analysis. Vulnerability indicators are also subdivided into 4 main groups: 1) the state of a facility according to visual and instrumental observations, the compliance of the main parameters with the maximum permissible values (GTS safety criteria); 2) the state of environment in GTS influence zone (according to monitoring data); 3) the organization of GTS operation, the compliance with the norms and requirements for safe operation; 4) the readiness of a facility for the localization and the elimination of emergency situations.

The risk assessment of an accident is performed on the basis of an expert analysis of an accident hazard level and the level of GTS vulnerability. In order to assess an accident risk level, a risk factor is calculated based on the principle of these events intersection, i.e.:

$$r_a = \lambda \cdot \nu$$

where: λ - the hazard factor for GTS; ν - the coefficient of GTS vulnerability.

The physical meaning of the coefficient r_a is that it represents a hazardous effect measure (dose) on a given GTS with an established degree of vulnerability. The level of GTS safety is assessed by the value of the risk factor r_a in accordance with the data given in Table 13 of the "Methodology" (Methodical recommendations for the assessment of accident risk at hydrotechnical structures of the water facilities and industry (Text) // 2nd edition, revised and supplemented, M. "DAR/VODGEO", 2009.).

The ranges of the coefficient r_a in Table 13 «Methods...» (Methodical recommendations for the assessment of accident risk at hydrotechnical structures of the water facilities and industry (Text) // 2nd edition, revised and supplemented, M. "DAR/VODGEO", 2009.) are assigned in such a way as to link practically the characteristics of an accident risk with the qualitative characteristics of safety level regulated by the "Administrative Regulations for the implementation of the state function by Rosvodresursy, Rostekhnadzor and Rostransnadzor concerning the state registration of hydrotechnical structures and the maintenance of the Russian Register of Hydraulic

Engineering facilities», approved by the order No. 117/66 of the Ministry of Natural Resources and the Ministry of Transport of Russia on April 27, 2009.

The determination of the accident risk factor r_a makes it possible to estimate the probability (the frequency) of P_a (GTS) accident occurrence in accordance with the following formula:

$$P_a(\text{ГТС}) = 0,5 \operatorname{erfc} \left[\beta \cdot \frac{\ln(r_a/r_k)}{\ln(r_{\text{доп}}/r_k)} \right]$$

where r_k is the catastrophic value of the risk factor ($r_k = 1$); $r_{\text{доп}}$ - the permissible value of the risk factor, above which the normal level of GTS safety is not ensured ($r_{\text{доп}} = 0,15$); β - the probability ratio, depending on GTS class (Table 14 "Techniques ...") (12); $\operatorname{erfc} x$ - probability function.

2.3 The prediction of a breakthrough wave in an accident

During the first phase of a hydrodynamic accident, a dam breakthrough takes place, which is the process of propane development, through which an uncontrolled flow of water from the upper water of the reservoir rushes to the tail water (F.K. Abdrazakov, T.A. Pankova, S.S. Orlova, V.T. Sirota. 2017). The flow of water, rushing into the passage, forms a breakthrough wave, which has a significant speed of movement and a great destructive power. Thus, a breakthrough wave in a hydrodynamic accident is associated with the emergence of an emergency situation associated with the flow of water at considerable speeds.

The main parameters of a breakthrough wave leading to catastrophic consequences include: the height and the depth of propane, the speed of the water flow, the temperature of water and the time of wave existence. The physical essence of a breakthrough wave is the unsteady movement of water flow, in which the main parameters change in time (Orlova S.S., Abdrazakov F.K., Pankova T.A. 2016; Orlova S.S., Abdrazakov F.K., Pankova T.A. 2018).

An unsteady motion is the most general form of motion, in relation to which the steady motion is a particular case of an unsteady motion. An unsteady motion actually goes to a steady one if there is a long section in the watercourse, close to the prismatic one, i.e. an unsteady motion on a part of this area practically turns into a steady one. A steady motion can be changed into an unsteady one if any cause causes the change of time consumption in one of reach sites, and consequently, the level and other parameters of the mode.

A dam destruction and the breakthrough of the pressure front lead to terrain flooding. The zone of flooding is formed gradually, as a wave passes along a river bed. Following the front of a breakthrough wave, its height begins to increase intensively, and after a certain period of time it reaches a maximum value exceeding the edges of the river banks, and thus a floodplain flooding begins (Ivashchenko I.N., Ivashchenko K.I. 2016). When the water level across the entire width of the flow ceases to rise, a more or less prolonged period of water movement takes place, close to the steady one. The final phase of the territory flood zone development is the decline of water levels. The result of a wave breakthrough, is the heavy deformation of a riverbed, and the floodplain remains excessively moistened for some time.

In order to predict a breakthrough wave and the flooding characteristics of the terrain during a hydraulic unit facility destruction, the "Volna" program (version 2.0) was used. The program allows you to assess the consequences of a hydrodynamic accident. The parameters of the terrain flooding are determined - the maximum depth of flooding, the width of flooding and the current speed; the arrival time of a front, a crest and a tail of a breakthrough wave, the maximum water flow in a

site, a wave height (the exceed of water level above the level of a domestic flow) and the maximum mark of flooding.

Considering that during the entire period of hydraulic structure operation, the water levels in a reservoir were significantly lower than the design levels, and they have been declining steadily during the last years; the feeding of a reservoir from the water outlet of the second branch of the main canal (VMK-2) of the Saratov irrigation-watering canal named after E.E. Alekseevsky has not been carried out for a long time, and the maximum

volume of spring flood of the Bolshoy Uzen river makes 2 million m³ (based on long-term observations), the maximum volume of water recorded in the reservoir is taken for the entire period of operation (19.0 million m³) to predict a breakthrough wave.

The initial data on a hydraulic unit are presented in Table 1.

Table 1 Initial data on a hydraulic unit

Hydraulic unit site characteristics	Parameter	Un. of meas.	Value
1. Reservoir volume	W _B	mln. m ³	19
2. Dam reservoir depth	H _B	m	16,45
3. Reservoir mirror area	S _B	mln. m ²	2,37
4. Reservoir width near a dam	B _B	m	2074
5. River depth in the downstream of a hydraulic unit	H ₆₀	m	0,5
6. The river width in the downstream of a hydraulic unit	B ₆₀	m	6
7. Flow velocity in the downstream of a hydraulic unit	V ₆₀	m/s	0,2
8. Reservoir depth at a dam at the time of HU destruction	H _p	m	8,6
9. The degree of hydraulic unit destruction	E _p		0,02
10. The breach threshold height	p	m	7
11. Reservoir water reduction mark	Z _B	m	91,45

3 Results

3.1 Scenario prediction results concerning the development of a GTS accident

The works on the object survey were carried out in May 2017. For the last 5 years, the reservoir was not used for its intended purpose (water was not taken for irrigation and water supply, there are no fish farms). Since 2011, the reservoir has been shut off from the water outlet of the main canal (VMK-2) second branch of the Saratov irrigation and watering canal named after E.E. Alekseevsky.

Analyzing the current state of hydraulic structure parameters of the Nepokoevsky reservoir and the design data of the structural elements presented by the operational service of the hydraulic unit, the following conclusions can be drawn:

1. There were no emergencies during 33 years of operation of the Nepokoevsky reservoir, and no significant damage was observed in the elements of the structures. During the entire period of the reservoir operation, ongoing repair works were carried out, including the overhaul of the bridge crane, the manufacturing of the repair shutter, the elimination of partial damages on the upper and the lower slopes, etc.
2. During the entire period of the hydraulic structure operation, the water horizons in the reservoir were significantly lower than the design levels (according to the design, the NWL mark is 98.05 m, which corresponds to a total water volume of 48.8 million m³) in 2013-2017. The maximum volume of water was 7.5 million m³, which corresponds to the water level of 86.5 m, and for the whole period of the reservoir operation the maximum volume of water in it was 19.4 million m³ with the pressure of 16.45 m, which corresponds to the water level of 91.45 m.

3. The free capacity of the reservoir makes 29.8 million m³ and is capable of accumulating the floods with 0.5% of supply. Taking into account the foregoing and comparing the pressures acting on the dam in both cases (16.45 m and 23.6 m), it can be concluded that the values of the breakthrough wave parameters and, accordingly, the damages in the case of the dam possible destruction in the current operating conditions will be much lower, than at design parameters.
4. However, a partial or a complete destruction of the hydraulic unit will result in the loss of the reservoir capacity in the upper tail and, accordingly, the reservoir will not be able to perform its functions under current operating conditions.

The potential sources of danger for the GTS of the Nepoevsky reservoir may be the following ones:

- the manifestations of structural defects in hydraulic structures during long-term operation due to the aging of materials and the changes of their properties under the influence of external factors;
- the operation of the GTS does not comply with the requirements of the existing norms and rules for the provision of their reliability and safety;
- the lack of timely repairs of structures;
- the lack or an insufficient volume of measures to ensure the readiness of the facility to the localization and the elimination of emergency situations.

In accordance with the design features of the GTS of the Nepoevsky reservoir, several scenarios for the development of accidents can be predicted if it is operated in the project mode (Table 2).

Table 2 Scenarios for the development of possible reservoir accidents

Scenario №	Prerequisites and stages of an accident development on GTS
1	A spillway damage, creating the threat of waterfront destruction with propane and a flood zone development.
2	The damage of individual elements of the spillway structure, the failure of hydromechanical equipment, leading to the need for emergency reduction of pressure on the GTS and accompanied by the discharge of water.
3	An increased filtration through the body and the base of the dam with the dam body materials aging and the change of their properties under the influence of external factors, the appearance of local places on the bottom slope of concentrated water filtration, the slumping or the collapse of the dam lower slope, the development of a breakthrough and a breakthrough wave with further destruction of the dam.
4	A terrorist act, man-made and natural disasters creating the threat of the pressure front destruction with the formation of a closing gap and a flood zone.

The analysis of the list of 4 predicted scenarios for the development of GTS accident shows:

Taking into account the greatest depth (pressure) of water in the dam upper water dam during the development of a hydrodynamic accident under the scenario No. 1, this scenario may lead to the most severe consequences, due to the damage and the destruction of spillway structure elements in the case of the operation service unavailability to the elimination of the above-mentioned causes of a possible GTS accident.

The most likely scenario is the scenario №2, when the damage of individual elements of a spillway structure or the failure of hydromechanical equipment leads to the need of the GTS pressure emergency decrease, and the discharge of water into the downstream through the bottom outlet, which will lead to the river water level increase.

The scenario № 3, associated with the filtration of water through the dam body is unlikely in the interfaces of GTS elements and by the contact with the dam base. Many years of operation and

visual observations confirm the absence of filtration and the removal of soil.

The likelihood of scenario # 4 implementation is difficult to assess. A terrorist act is unlikely due to the absence of any serious reasons for its commission and a high risk of an act performance. Technogenic and natural disasters are also unlikely because there are no sources in the immediate vicinity of the reservoir that can cause them.

3.2 Results of an accident risk assessment

The value of the coefficient β for class III facilities, corresponding to the permissible probability of an accident P_a (GTS), equal to $3 \cdot 10^{-3}$ 1/year, makes $\beta=1.95$ (SP 58.13330.2012).

Tables 3 and 4 present the results of an integrated expert assessment of an accident hazard and the vulnerability of the Nepokoevsky reservoir GTS for scenario 1 (with the most severe consequences).

Table 3 Integral assessment of an accident risk level

Item №	Hazard indicator	Hazard level	Code	Distinctive features on the basis of which the degree (the level) of hazard is determined according to the hazard indicator in question
1	The danger of natural load exceeding	No danger	0	The loads and impacts were reduced during the past period of operation, taken at the design basis of the dam construction at the Nepokoevsky Reservoir. The water level in the water storage did not exceed 91.45 m, which is much lower than the mark of NWL making 98,05 m.
2	Substantiation and the compliance of design solutions with modern regulatory requirements	Small danger	1	The project has no significant deviations from the current regulatory requirements (SP 58.13330.2012) for all estimated factors. However, it should be noted that there are no surface marks necessary for carrying out field observations at the dam, which does not meet the requirements of SP 39.13330.2012 for Class III facilities.
3	The compliance with structure design, the conditions of its operation, the properties of the construction and foundation materials	No danger	0	The structures of the dam correspond to the project taking into account the repair work carried out during the operation (the elimination of local damage to dam slopes, the bridge crane overhaul, the manufacturing and the installation of the repair shutter). The deviations from the project in USL markers and the volumes of the reservoir are caused by the changed operation regulations.
4	Possible consequences and the damage in the event of an accident	Small danger	1	In the case of the pressure front destruction at the GTS of the Nepokoevsky water reservoir with the existing marks of its filling, the damage from the hydrodynamic accident to the population and the enterprises in the area adjacent to the reservoir will be up to 100 thousand rubles. By the spread of a breakthrough wave (does not go beyond the limits of one district), the scale of the emergency situation in the case of an accident on the GTS (in accordance with the classification approved by RF Government Resolution No. 304 issued on May 21, 2007 (The resolution of RF Government No. 304 "On the Classification of Emergencies of Natural and Technogenic Character" issued on May 21, 2007)) is classified as a local emergency.

The integral code of hazard indicators in accordance with the data of Table 3 makes 0101.

The hazard ratio $\lambda=0,125$.

Table 4 Integral assessment of vulnerability

Item №	Vulnerability indicator	Vulnerability level	Code	Distinctive features on the basis of which the degree (the level) of hazard is determined according to the vulnerability index
1	The state of the dam according to visual and instrumental observations	Small	1	According to the observations and the surveys in general, the structures are in a working order, but there are chips in the concrete lining of the dam and the gates of the spillway are not closed tightly; there is no exceeding of the monitored PDZ indicators.
2	The state of the environment in the zone of hydraulic structure influence	Absent	0	The reservoir does not influence the state of environment and the living conditions of the population area where the hydraulic unit is located.
3	Organization of the dam operation (compliance with safe operation requirements)	Small	1	The organization of operation has minor deviations from the current regulatory requirements concerning GTS security: there is no KIA on the dam, which does not meet the requirements of SP 39.13330.2012 (14) for the construction of the IIIrd class structure. Round-the-clock duty is not provided.
4	An object readiness for the localization and the liquidation of emergencies	Small	1	There are minor deviations from the requirements for an object completion to the localization and the elimination of emergencies: the stock of building materials is stored not on a site but on the basis

Item №	Vulnerability indicator	Vulnerability level	Code	Distinctive features on the basis of which the degree (the level) of hazard is determined according to the vulnerability index
				of the operating organization, there is no local warning system (LWS) about an accident.

According to the data of the Table 4, the integrated vulnerability code of the dam is 1011, which determines the vulnerability factor $v = 0,2833$.

In accordance with the received hazard factors λ and the vulnerability v the accident risk factor for the dam is

$$r_a = 0,125 \cdot 0,2833 = 0,0354$$

and an accident occurrence probability makes:

$$P_a(\Gamma TC) = 0,5 \cdot \operatorname{erfc} \left[1,95 \cdot \frac{\ln(0,0354/1)}{\ln(0,15/1)} \right] = 5,5 \cdot 10^{-4} \text{ 1/year}$$

Similarly, the result of the integrated expert assessment calculation concerning the hazard and the vulnerability of GTS accident of the Nepoevsky reservoir is provided according to scenarios 2-4.

The integral hazard code is estimated as 1021, which corresponds to the hazard ratio $\lambda = 0.125$ For Scenario 2 (the most likely accident), where the maximum consequence may be an unscheduled operation of the reservoir with maximum project costs, which will not cause a significant hydrodynamic accident and territory flooding.

At that the vulnerability code for the dam makes 1021, which determines the vulnerability factor $v = 0.3833$. In accordance with the received hazard factors λ and the vulnerability v , the accident risk factor for the dam is

$$r_a = 0,125 \cdot 0,3833 = 0,0479$$

and an accident occurrence probability makes:

$$P_a(\Gamma TC) = 0,5 \cdot \operatorname{erfc} \left[1,95 \cdot \frac{\ln(0,0479/1)}{\ln(0,15/1)} \right] = 1,6 \cdot 10^{-3} \text{ 1/год}$$

Given that scenario 3 and scenario 4 are unlikely, then the hazard factor λ and the vulnerability factor v will be equal. The integral hazard code is estimated as 0001 for them, which corresponds to the hazard ratio $\lambda = 0.0625$. At that, the vulnerability code of the dam is 0010, which determines the vulnerability factor $v = 0.1$. In accordance with the received hazard factors λ and the vulnerability v , the accident risk factor for the dam is

$$r_a = 0,0625 \cdot 0,1 = 0,00625$$

and an accident occurrence probability makes:

$$P_a(\Gamma TC) = 0,5 \cdot \operatorname{erfc} \left[1,95 \cdot \frac{\ln(0,00625/1)}{\ln(0,15/1)} \right] = 0,75 \cdot 10^{-6} \text{ 1/год}$$

3.3 Breakthrough wave calculation results

The report on the work in the program "Wave" (version 2.0) is presented in Table 5 and in the form of calculated sites (Figures 1-7), by which it is possible to determine the parameters of a breakthrough wave and a territory flooding: wave height, flow depth, the movement velocity and the time of different peculiar wave point arrival (front, crest, tail) to the calculated sites located on the river below the hydraulic unit, as well as the duration of a wave passage through these sections and the time of its fall.

Table 5 Report on the work in the program "Wave", version 2.0

Breakthrough parameters	Site №									
			0 st.	1 st.	2 st.	3 st.	4 st.	5 st.	6 st.	7 st.
Site removal from a hydraulic unit	Lci	km	0	0,95	6,4	8,5	11	15,7	19,3	23
Maximum water flow in the site	Qi	t.m ³ /s	0,01	0	0,01	0,01	0,01	0,01	0	0,01
Maximum flow velocity	Vi	m/s	2,27	1,83	2,36	1,81	2,16	1,35	1,97	1,18
Wave height	Hri	m	0,9	0,62	0,55	0,35	0,46	0,17	0,33	0,14
Maximum depth of flooding	Hi	m	1,4	1,12	1,05	0,85	0,96	0,87	0,63	0,64
Maximum mark of flooding	Zi	m	76,4	73,12	68,55	67,85	65,46	64,17	63,73	63,24
Time of wave front approach	Tφi	min	0	9,07	61,52	80,17	104,93	151,45	195,54	236,35
Time of wave crest approach	Tri	min	0	32,19	316,08	417,74	546,66	732,26	940,93	1089,5
Time of wave tail approach	Txi	min	12962,3	13041,4	13495,6	13670,6	13878,9	14270,6	14570,6	14878,9
Flooding time	Tзr	min	12962,3	13032,4	13434,1	13590,4	13774,0	14119,2	14375,1	14642,6
Maximum width of flooding along the left bank		m	16,81	22,42	27,58	35,92	28,1	25,25	38,59	30,42
Maximum width of flooding along the right bank		m	16,81	10,87	14,56	17,09	17,32	27	36,21	39,48



Figure 1: Site №1 – the removal from hydraulic unit makes 0,95 km.

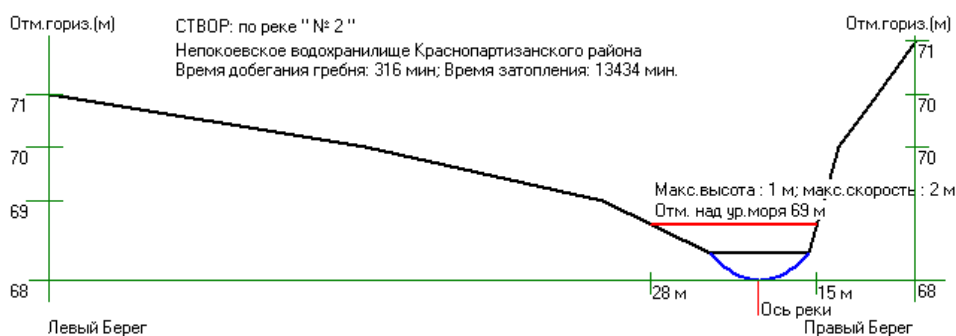


Figure 2: Site №2 – the removal from hydraulic unit makes 6,4 km.

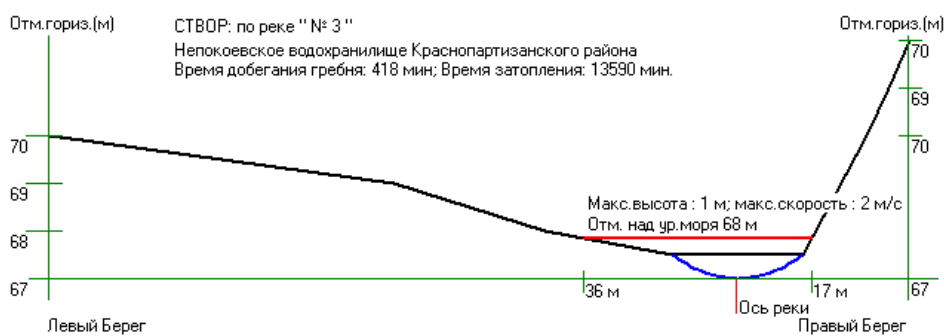


Figure 3: Site №3 – the removal from hydraulic unit makes 8,5 km.

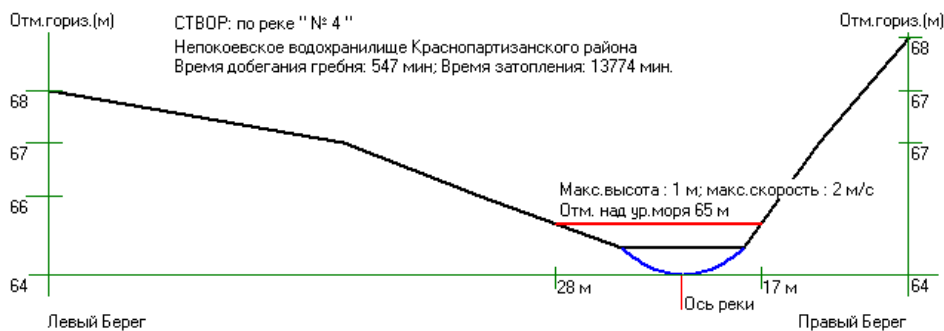


Figure 4: Site №4 – the removal from hydraulic unit makes 11 km.



Figure 5: Site №5 – the removal from hydraulic unit makes 15,7 km.

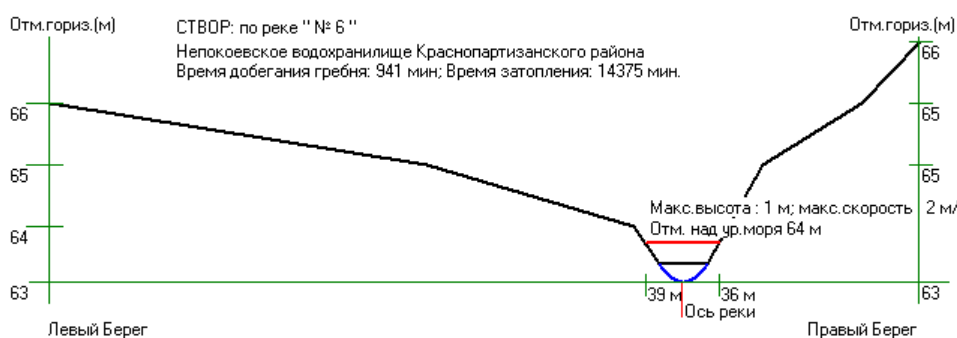


Figure 6: Site №6 – the removal from hydraulic unit makes 19,3 km.

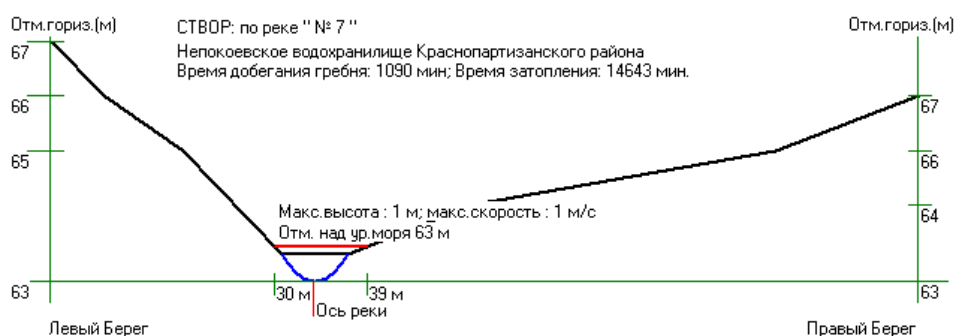


Figure 7: Site №7 – the removal from hydraulic unit makes 23 km.

Отметка горизонтальная (м) - Horizontal mark (m) / СТВОР: по реке "№7" - SITE: along the river "№ 7" / Непокоевское водохранилище Краснопартизанского района - Непокоевское Reservoir of the Krasnopartizansky District / Время добегаия гребня: 1090 мин.; Время затопления: 14643 мин. - Crest run time: 1090 minutes; Time of flooding: 14643 min. / Максимальная высота: 1 м.; максимальная скорость: 1 м/с - Maximum height: 1 m; maximum speed: 1 m/s / Ось реки - The river axis / Левый/правый берег - Left / right bank

4 Discussion

During the assessment of a dam hydrodynamic accident risk, it is necessary to predict the accident scenarios correctly taking into account all possible situations. Based on the results of risk assessment, the most likely scenario should be taken. The calculation of a breakthrough wave is carried out according to the scenario with the most severe consequences. When a breakthrough wave passes through the river floodplain, the water that leaves the banks sweeps away any obstacles and destroys

the buildings and the structures that are on its way. Therefore, the parameters of a breakthrough wave dynamic interaction with structures are determined during calculation, and the parameters of its propagation in the floodplain regions are calculated (V.Ya. Zharnitsky, E.V. 2016).

Taking into account that the breakthrough wave is the main damaging factor at the hydrodynamic accident on the hydraulic structures, it is necessary to determine its parameters to assess the consequences in the zone of the area catastrophic flooding: the wave height, the depth of the stream, the speed of movement and the time of reaching the calculated sites, located on the river below the hydraulic unit, by various characteristic points of the wave (front, crest , tail) as well as the duration of the wave passage through these sections and the time of its decline.

5 Summary

In the event of spillway structure individual element damage, the failure of hydromechanical equipment, the maximum consequence may be an unscheduled drainage of the reservoir

with maximum costs, which will not cause a significant hydrodynamic accident and territory flooding (the most likely scenario). In the case of the spillway destruction, the threat of the pressure front destruction is created, followed by the formation of a closing gap and the territory flooding, i.e. the most severe consequences (the most difficult scenario).

In accordance with the classification of GTS Russian Register, the level of dam safety is estimated as normal, corresponding to the accident risk factor within the established limits, namely, $r_a < 0,15$; according to the classification of risk level (Table 16, "Methods ..." (12)), the risk of GTS accident occurrence probability is assessed as an acceptable (permissible) one, since the obtained probability values for the accidents on pressure GTS (Class III) are less than $3 \cdot 10^{-3}$ 1/year.

According to the calculation results, the maximum flooding width will be 39.48 m on the right bank, the maximum depth of flooding will be 1.22 m at the distance of 0.95 km from a hydraulic unit site, the maximum speed of the wave is 2.16 m/s at the distance of 11 km from the hydraulic unit site. At a distance of more than 23 km from the hydraulic unit site, the parameters of the breakthrough wave are within the permissible values, which do not cause a destructive effect and any consequences of a negative nature.

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Primary Paper Section: A

Secondary Paper Section: AQ

THE INFLUENCE OF VERTICAL AND TEAM LEADERSHIP ON STARTUP PERFORMANCE

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Abstract: One of the most common causes of extinction of startups is the inability of the founder to create a functional startup team. Startups are therefore considered the ideal context for studying both vertical and team leadership. Within the framework of vertical leadership, it is necessary to examine the quality of the startup founder's ability to formulate an original and attractive vision, to inspire co-workers to achieve it, to encourage them in crisis situations and also to develop their competence. The essence of team leadership is the creation of a cohesive team, whose members support each other, have divided roles, responsibilities and authorities. Based on a research sample of 76 Slovak startups, there was investigated the founder's tasks in the startup and the quality of teamwork in the startup team.

Keywords: startup, vertical leadership, team, team leadership

1 Introduction

Purpose of leadership is to unite heterogeneous group in concern of achieving common goal, therefore startup must work as a team. Team work is one of conditions for leadership and leadership is one of conditions for team work. Startup without a leader who creates and communicates vision, inspires and trains employees, exists on a market without an aim (Zäch, Baldegger, 2017). Despite this, there exist very few empirical researches explaining leadership in startups. Most of the knowledge about this issue has a hypothetical nature. Most of authors state that in startups there exist vertical leadership based on ideas and decisions of single person (leader) and team leadership, which involves members of their team into decision making.

2. 1 Vertical leadership in startup

Vertical leadership is based on nominated leader. Person on a higher level of hierarchy is formally appointed to influence actions of people on lower levels (Ensley, Hmieleski, Pearce, 2006). This type of leadership allows to clearly distinguish the role of a leader from role of followers (Pearce, 2004). This concept dominates in literature of leadership. According to Klotz et al. (2014) researches usually concentrate on role of founder (leader) in development of new business. Baum, Locke and Kirkpatrick (1998) found out that „inspiration and vision of founder are driving force of any startup“. Similarly, in accordance with Timmons and Spinelli (2008) it is fundamental for success of startup that founder is a strong leader.

Vertical leadership is perceptible in startups especially in early phases of life cycle. It is usually an individual with leading or visionary abilities who identifies business opportunities and establishes a new business. Even though startups are usually established by team of people, there is appointed a single formal leader amongst members of the team (Ensley, Hmieleski, Pearce, 2006). Demonstration of perseverance and steadiness, reliability and honesty (Timmons, Spinelli, 2008) are most significant attributes of beginning business appreciated by investors. Baum, Locke and Kirkpatrick (1998) state that „the role of a leader as founder of startup is to create a vision of new business and influence others (investors, employees, partners and customers) to buy his dreams“. According to Bryant (2004) „leaders in starting business must interest their employees in a way that startup could succeed in realisation of innovative and unexplored business objective and subsequently compete with running competitive business“. Zäch and Baldegger (2014) claim that startups have often very flat organisational structure with low number of hierarchy levels and have mostly just one level of leadership, which is occupied by founder and leader in one person. Similarly, Vendetti (2010) contributes, that startups have very simple organisational structure with powers centralised at the top of hierarchy. According to Timmons and Spinelli (2008) in successful starting businesses, democracy and groundless

equality in division of design making power do not work and thus it is more appropriate to clearly determine a leader, who possesses top powers and responsibilities.

In startup almost all strategic and tactical decisions are made by founder and are mostly based on their intuition (Vendetti, 2010). Behaviour of leaders (founders) has bigger, more direct impact on performance of startup in comparison with bigger and running businesses. This is confirmed by KetsDeVries and Miller (1986), who believe that „individual characteristics and behaviour of leaders influence development and long term sustainability of startup“. Equally, according to Hambrick and Mason (1984) „startups are often perceived as image of its top management“. Timmons and Spinelli (2008) actually claim, that „even in startups with big potential of growth, leaders are more important than technology“.

2.2 Team leadership in startup

According to Timmons and Spinelli (2008) success of startup is influenced not only by strong leadership of founder but it is also important to build a team whose members have skills, talents and ability to work as a team that complement each other. Klotz et al. (2014) state that most of new businesses are established and led by teams, not individuals. Pearce (2004) defines team leadership as „current, lasting and mutual influencing of people and processes within a team, which is characteristic for its serial formation of official and nonofficial leaders“. In practical application of common leadership, every member of a team is competent to influence actions of other team members and thus it cannot be clearly distinguished who is a leader and who is follower (Pearce, 2004). Gronn (2002) describes this approach as „distributed“ leadership. Pearce, Conger and Locke (2008) talk about „common“ leadership. Senge and Covey about „distributed“ leadership. Koccolowski (2010) contributes with term „collective“ leadership. In literature, the most commonly appearing term is team leadership. Timmons and Spinelli (2008) state that startups with high growth potential are mostly built and led by a team, moreover successful startups with high growth potential are more often founded by team of founders than unsuccessful startups with high growth potential which are often founded by individuals. Manz and Sims (1993) warn, that „teams that are highly efficient do not have structure of formal leadership.“ According to Koccolowski (2010) power of decision making also responsibility in conditions of team leadership are evenly distributed on all team members. Team responsibility is thus based on cooperation of collective. Pearce and Sims (2002) found out that „application of team leadership allows businesses to achieve better results in comparison with vertical leadership“.

With growth of startup it is not possible for one leader to cover all functions and to carry all responsibility, no matter how capable he is. Founder of startup should learn to delegate tasks and competences. Borza (2015) states that many good ideas will not turn into successful products, because the startup founder is not capable and willing to share an idea, delegate competences and create a team. Practise has showed so far, that startup projects with more people participating on them have bigger chance to succeed on a market, compare to those who start to establish business on their own (Dupař, Porubanová, Richnák, 2017).

Researches identify inability of founder to create quality team and work within the team as one of the most common causes of startup failure (CB Insider). Professionals agree that „vertical leadership is very effective in managing dramatic changes“, which was also confirmed by researches (Dunphy, Stace, 1993). Real leadership involves aspects of vertical as well as team leadership. Both types of leadership are considered an important condition of successful startup and also startups are considered an ideal context for their studies.

Leader and team are considered an important condition for startup existence, but dynamics of their development is not known in small and quickly changing startup and impact on its performance, which would be confirmed by quantitative evidence. Equally, common functioning of leader and team on business performance is not known, which could deepen knowledge of their synergic impacts.

3 Aim, research sample and work methodology

Based on literature studies it is possible to assume that key condition of viable and successful startup is effective team. Objects of research are startup teams and its structure in cycle of business idea. The aim of the paper is to find out how it develops, what is the content of vertical and team leadership in individual phases of business idea development. The hypothesis is that quality (developed, visionary, creative and hardworking) team is fundamental and central assumption for success of startup. Hypothesis would be confirmed by existence and tightness of relationship between vertical and team leadership and efficiency of startup.

Phases of startup development are recorded on *scale of business idea development (business cycle)*: 1 - idea/concept/research 2 – product development, 3 – product prototype/testing, 4 – first incomes, 5 - growing incomes. Quality of a leader, team work and quality of relationships in a team are measured on a following scale: 1 – *minimal*, 2 – *low* 3 – *sufficient (however it could be better)*, 4 – *satisfying (but there are still some reserves)*, 5 – *brilliant*. Performance of startup is measured in number of users, number of customers (paying users) and incomes.

Quality of vertical leadership is assessed via four variables which are quality of leader such as creator of an original vision, their ability to inspire, encourage and develop competencies of their co-workers. Quality of team leadership and relationships within the team is examined using seven criterion, which are coherence, mutual support and trust of team members, division of roles within the team, division of labour, cooperation, creativity of team members, personal initiative and contribution of team members to final result.

Research took place on a sample of 76 startups. Sample was assembled based on consultations with investors and representatives of coworking centres, incubators and accelerators. Every startup was examined by a single member of a research team who in proper interview led by leading person/founder personally noted answers to closed and opened questions into questionnaire. Another source of knowledge were interviews with team members and publicly available information about researched startups from their websites. Statistical analysis of researched sample lies in descriptive and inductive statistics. Researched variables are expressed as average values, multiplicity and share. Causal coherence was examined on bases of multiple linear regression, which measures impact of leaders and teams on selected coefficient of startup efficiency. There is comparison of influence of independent variables with an aim to differentiate variables with considerable impact on researched dependant variable. Model is gradually modified in order for it to have such structure which can explain researched variable in a best way. For this reason, there were removed variables with lowest and statistically nonsignificant impact and concurrently condition for growth of determinant coefficient must have been met. Expressing power of model in case of one explanatory variable was assessed by means of coefficient of determinant and in case of several variables by means of modified coefficient of determinant. For statistically significant is considered level $p < 0,05$.

4 Results of research

4. 1 Structure of startup leadership in development cycle of business idea

Vertical leadership is clear especially in early phases of development of business idea (tab. 1). In early stages of business idea the driving force of startup is enthusiasm of founder, inspiration and motivation of other coworkers. This effect of leader in other phases of startup decreases. Research confirmed decreasing importance of vertical leadership in relation to startup development with an exception of final phase, where the importance of vertical leadership increases again. Even in final phase, the level of leadership is higher than in early stages of development of business idea. Vertical leadership is expressed by four variables (tab. 2). Startup establishments expressed themselves as outstanding visionaries, but they devote less effort to development of competencies of their coworkers in form of education, coaching or mentoring.

	Phase of business idea development				
	1.	2.	3.	4.	5.
Vertical leadership	-	4,05	3,87	3,49	4,38
Number of start-ups	0	8	27	22	19
Share of startups (%)	0	10,53	35,53	28,94	25,00

Tab. 1: Vertical leadership and business idea development

Variables of vertical leadership	Phase of business idea development				
	1.	2.	3.	4.	5.
Creation of vision	-	4,60	3,78	4,00	4,62
Inspiration of fellow workers	-	4,20	3,67	3,93	4,46
Encouragement of fellow workers	-	4,20	3,39	3,87	4,46
Competency development of fellow workers	-	3,20	3,11	3,67	4,00

Tab. 2: Variables of vertical leadership and phases of business idea development

The leader's quality (tab. 2) in the reviewed startups is satisfactory (but there are some imperfections) or suitable (but could be better). Leaders identify with their role and have a very high level of judgment. The differences between the leadership parameters are very slight, but they still indicate that in some properties the leaders are better or more pronounced and lacking in some other way. Leaders are able to create above average original and attractive, but not absolute, top vision. They can inspire at the similar level their closest surroundings so that fellows can follow the prescribed vision and objectives.

The importance of the founder as the creator of the vision, which is the driving force behind the start-up, confirms the words of the founder of the startup who created the navigation for the operating systems: "I am an executive type. I do not enjoy sitting and dreaming, on the contrary, getting into it and getting things moving. When you start doing things I think you are just beginning to dream about how to do it or how to do it differently." The leader has to know how to captivate people for his vision. It is also confirmed by the startup founder who focuses on pay per click sales of advertisement on the Internet. Although, he initially engaged in a job-mediation business, he managed to wow the original business team for the new business making too. He told his colleagues that the original business ended, explained to them a new vision and offered to continue with it. Although more than one year he did not pay wages, team of ten people still stayed and workers gained minority shares in the company.

Leaders encourage other team members when startup gets into trouble, complications, and suffers from failure. Their agitation in difficult situations only lags slightly behind the level of vision

and acceptance of vision by other members of the team. The relatively weakest aspect of leadership is the development of co-workers' competence. The founders of startups now pay the least attention to the development of their co-workers' competence. This is due to the fact that most of the investigated startups are still in their early stage of development (the average duration of the startups in the study sample is 1,93 years), where leadership addresses issues of existential character (establishing a startup, developing a business idea, creating a startup team, global expansion). Although currently leaders do not pay enough attention to the development of human potential, it is likely to change with the further development of business.

On contrary to vertical leadership importance of team leadership with development of startup grows (tab. 3). If startup progresses, it is extremely difficult for leader to manage all tasks and carry all responsibilities, and hence it increases importance of team leadership. Quality of team leadership is described by seven criterion (tab. 4). Research showed that quality of relationships in startup team is given especially by coherence, mutual support and trust of team members. These aspects of team work were assessed as highest amongst criterions of team leadership. Formal and informal division of labour and roles, on contrary, got the lowest assessment.

	Phase of business idea development				
	1.	2.	3.	4.	5.
Team leadership	-	3,86	4,11	4,29	4,57
Number of start-ups	0	8	27	22	19
Share of startups (%)	0	10,53	35,53	28,94	25,0

Tab. 3: Team leadership and business idea development

Variables of team leadership	Phase of business idea development				
	1.	2.	3.	4.	5.
Cohesion	-	3,33	3,92	4,19	5,00
Mutual support	-	3,33	3,88	4,38	5,00
Division of roles	-	3,50	3,58	4,00	3,50
Division of labour	-	3,33	3,69	4,06	3,00
Cooperation	-	3,00	3,96	4,00	4,50
Creativity	-	3,50	4,00	3,88	4,50
Individual initiative	-	3,17	3,96	4,25	4,50

Tab. 4: Variables of team leadership and phases of business idea development

The quality of the team is high, but there are differences that indicate that teams are acting better in borderline, unpleasant and crisis situations, and team members are willing to cooperate, but teams are resulting a little weaker if the quality of individual members is evaluated, e. g. their personal initiative and individual work contribution, formal division of labour in the team, and informal division of roles. Overall, compact quality of the team is slightly higher than that of its individual members.

Mutual support of team members in unpredictable and crises situations have appeared in startup which provides services of electronic mail. All five members of startup team were having fun at work party playing bowling, when around midnight the leader received a phone call announcing that main server stopped working and hence the application was completely dysfunctional. The whole team returned back to work and all worked till early morning hours to fix the outage. Startup leader stated that he did not have to persuade or force anyone, everybody realised seriousness of the situation and proved their responsible approach to work and that they support each other.

4.2 Impact of leadership on startup performance

Vertical and team leadership makes sense when it positively influences business performance of startup which is measured by number of users, number of customers and revenues. In-between researched parameters of vertical and team leadership positively influencing performance of startup are mutual support and trust

of team members in uncomfortable, unpredictable and crises situations, but research also showed that negative impact of formal division of labour on startup performance which was expressed by number of paying startup users (tab. 5).

Uncomfortable, unpredictable and crises situations represent especially lack of money in early stages of startup, payment of symbolic wages to members of team, because they invest into further development of business, extraordinary work effort, frequent departures and exchanges of team. Example is startup which develops software, web solutions and provides consultations in IT. Overtimes in early stages of business could not be counted by team members. Sometimes they worked 12 hours a day and also during weekends. Behaviour of people during crises situations is however, the best predictor of their future behaviour and performance.

	Variable	Users		Paying users/customers		Revenues	
Leadership	Vision	-0,64 (0,38)	-0,51 (0,34)	-0,05 (0,35)		-0,22 (0,36)	
	Inspiration	0,21 (0,33)		0,39 (0,31)		-0,05 (0,31)	
	Encouragement	0,02 (0,36)		-0,08 (0,33)		0,23 (0,34)	
	Competency development	0,36 (0,31)	0,47** (0,27)	-0,13 (0,29)		0,00 (0,29)	
	Mutual support	0,47 (0,43)		0,76° (0,40)	0,85* (0,27)	0,59 (0,41)	
	Division of roles	-0,12 (0,24)		0,04 (0,22)		0,19 (0,22)	
	Division of labour	-0,06 (0,26)		-0,63* (0,24)	-0,55* (0,20)	-0,30 (0,24)	
	Cooperation	-0,45 (0,39)		0,14 (0,36)		0,43 (0,37)	
	Creativity	-0,33 (0,31)	-0,42 (0,29)	-0,01 (0,29)		0,11 (0,30)	
	Individual initiative	0,48 (0,37)	0,52** (0,28)	0,07 (0,34)		-0,52 (0,35)	
	R ² modified	0,05	0,12*	0,06	0,18**	0,00	

*Level of significance °0,1 *0,05 **0,01
In brackets there is quoted a standard error.*

Tab. 5: Impact of leadership and team on performance of startup

Formal division of labour (responsibilities) and roles within a startup team achieved not only lowest average point assessment among parameters of team leadership (tab. 2), but it was also proven that formal division of labour has negative impact on startup performance, especially on number of paying customers (tab. 5). Startup teams consist mainly of very universal individuals. Startup founders do not seek their coworkers in common workplaces, but they choose freelancers (independent professionals without permanent employment) with previous experience of dealing with startup projects. Universal people are an advantage for startup, because they can cover number of jobs for the same salary. Moreover, in first months of its functioning, startup team assemble changes a lot, therefore startups need universal people who can take over responsibilities and tasks for a member who left. Formal division of work has significantly negative impact on performance, and thus it is possible to conclude that for startup, formal division of labour is not suitable. Formalisation may bring more transparency into startup and at the same time decrease its performance. Leadership itself (vertical) has only minor impact on performance, relevant is inspirational impact of leader on number of users.

5 Discussion

Vertical leadership in startups is evident mainly in early stages of business idea development. Startup founders have proven themselves as expressive visionaries, but less effort is devoted to development of competences of their coworkers. Contrary to vertical leadership meaning of team leadership with development of startup grows. Amongst researched parameters of vertical and

team leadership positively impact on business performance of startup especially mutual support and trust of team members in uncomfortable, unpredictable and crises situations. Formal division of labour (responsibilities) and informal division of labour in startup team achieved not only lowest point in assessment out of all parameters of team leadership, but concurrently proved that formal division of labour has negative impact on startup performance, mainly on number of paying users. Strict determination of responsibilities and duties brings more negatives than positives, weakens creativity and innovativeness. Founders and leading people in startups are more leaders than managers. They are able to inspire and ignite enthusiasm in their surrounding, but with progress of startup, enthusiasm starts to disappear and it is not substituted by quality managerial work. Founders do not devote sufficient time to professional development of their coworkers, formal division of work is counterproductive and importance of team leadership grows, which can work without a leader. In the end of startup development role of vertical leadership grows, because it is getting to "final", but it still cannot divert slowing down of business model development. Startup as imperfect business probably prefers more informal management.

6 Conclusion

Startups are an attractive topic for research because they are a relatively new and very dynamic business form (Slávik, Zagoršek, 2017). They carry out original business ideas, provide space for self-realization for independent personalities, bring extra earnings, but most of them fail. The aim of the research was to examine whether the vertical leadership and team leadership are a condition of the survival and later potential startup success. In-between researched parameters of vertical and team leadership positively influencing performance of startup are mutual support and trust of team members in uncomfortable, unpredictable and crises situations, but research also showed that negative impact of formal division of labour on startup performance which was expressed by number of paying startup users. Mutual solidarity in team is attribute to overcome obstacles and difficult times, which can lead to team breaking up. In rapid development of business formal division of work is expressed negatively on performance indicators. Formal division or roles may restrict creativity and flexibility. Formal division of labour negatively impact friendly atmosphere and enthusiasm, which are stronger motive to higher performance than vision of future incomes.

Evaluation of a startup reality is strongly recommended from a positive point of view than a normative point of view, since to outline the ideal picture of startup and the way how to build it does not make a sense. The purpose of the research is to know the real personal background of the startup, to explain it and to transfer new knowledge into practice. The startup need to be exposed a mirror, while leaving them unrestricted and free development, otherwise it is threatened the most valuable what they possess and that is enthusiasm, unconventionality, creativity. On the other hand, they can be offered help and support, but according to their needs, will and possibilities.

Research performed identified impact of several factors on startup performance. Results of present research might be further deepen and their causality verified, ideally with help of experiments.

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Primary Paper Section: A

Secondary Paper Section: AH

STRATEGIC PRIORITIES TO DEVELOP AN ADAPTIVE MECHANISM FOR AGRO-INDUSTRIAL COMPLEX SUSTAINABLE DEVELOPMENT

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Abstract. The increase of food security level requires the solution of a key problem on interaction effectiveness increase between a state and business in the direction of emerging contradiction smoothing and dampening, taking into account the provision of strategic priorities of food security and the trajectory of sustainable social and economic development for territorial and sectoral complexes. The results of the research demonstrate the expediency of taking into account three groups of factors that affect the effectiveness of the state program implementation concerning the support of the agro-industrial complex: financial, economic, social and environmental one. The proposed economic-mathematical model allows to perform a poly-criteria adaptation in accordance with the strategic priorities for an acceptable food security level provision, and also develop the procedure of target adjustment if they do not match the current socio-economic situation. Further adaptation of government programs for food security provision must take place and can be implemented on the basis of a wide range of instruments, the expediency of their use directly depends on a number of factors, both objective and subjective ones.

Keywords: food security, strategy, investment project, agro-industrial complex, economic interests

1 Introduction

The provision of food security is one of the key trends for the socio-economic development of the country and directly depends on the accumulated potential of territorial-branch complex import substitution. The increase of interaction effectiveness between public authorities in hierarchy levels at the federal and regional levels, as well as the harmonization of state interests with business representatives is a key problem, the solution of which will increase the level of food security to an acceptable level (Gavrilov V.V. 2009). The dual nature of private business interests on the one hand (Isaeva E.M. 2013), and the representatives of public authorities on the other creates the most crucial systemic contradiction that is related to the specific functioning of economic entities maximizing their profits, often to the detriment of socioeconomic development strategic goals for meso-level systems (V.M. Kruglyakova. 2012), which creates the need for regulation by public authorities in the direction of emerging contradiction smoothing and dampening, especially taking into account the strategic priorities of food security provision, as well as the progressive and the sustainable growth of the agro-industrial complex.

It is rather obvious that the regional authorities are directly interested in economic potential increase of the industrial complexes located on its territory, in the attraction of investment resources aimed at new competitive industry creation. As the number of works shows (Altukhov A.I. 2006, Leksin V.N. 2007), the agro-industrial complex of southern Russia regions acts as the so-called "growth pole" and is the systemic point of growth not only in the context of food security increase, but also for the development of the entire regional economy. It is obvious that the strategic priorities of the agro-industrial complex development should correspond to the social and economic potential of a region, the priorities of spatial and territorial development, to promote the diversified growth of industries, to stimulate the introduction of high-tech and competitive technologies, and to ensure the growth of population living standards.

2 The problems of state and business interest harmonization in the process of food security provision

A significant role in food security provision and the functioning efficiency increase of the territorial agro-industrial complex is played by the growth of domestic agricultural product competitiveness, not only in the domestic but also in global markets (8), therefore, a special role belongs to export-oriented development strategy of the agroindustrial complex and the related optimization of parameters by the foreign economic policy of the state in the context of national economic security provision, also implemented in the context of imports substitution, which was reflected not only in the federal target programs, but also in the socio-economic development strategies of RF subjects.

It should be borne in mind that a private investor always seeks to ensure the highest possible level of profit from the implementation of his projects. From these positions, the investment attractiveness of the territorial and sectoral complexes is seen as a key factor that influences the decision on the implementation of each particular investment project. Obviously, the tasks that are the key ones for regional and federal authorities (The Doctrine of Food Security in Russian Federation (Electronic resource): The Decree of Russian Federation President № 120 issued on January 30, 2010 URL: <http://www.scrf.gov.ru/documents/15/108.html>) such as the raise of population living standard or food security provision, are not the priority for business. In this regard, it is necessary to develop a mechanism to coordinate the interests of representatives among business and public authorities. In our opinion, the search for a tactical compromise in the interaction of economic agents within the system of food security provision will be ineffective. It is necessary to develop an effective organizational and economic system that will operate within the framework of the current concept for economic security provision, will reflect the strategic priorities and the tasks for business and state, and will allow to create a mechanism for contradiction elimination by the integration of private business to solve the issue of food security increase based on the implementation of government programs for domestic agricultural producer support.

As the analysis showed, the effectiveness and the expediency of such interaction will depend directly on three groups of factors that can be represented in the form of a competitive diamond by M. Porter:

- financial and economic efficiency of economic activities among agricultural producers;
- the availability of necessary production factors;
- the effectiveness of the state program implementation to support domestic agro-industrial complex.

In accordance with the Federal Law No. 172-FL "On Strategic Planning in Russian Federation" issued on June 28, 2014 (On strategic planning in Russian Federation. Federal Law of Russian Federation No. 172-FL issued on June 28, 2014) the list of requirements was approved to assess the effectiveness of state programs implemented in Russian Federation, which include not only certain indicators and targets, but also the algorithms of their phased implementation analysis. This allows to use it as a starting point for further improvement and modernization of existing approaches and the methodologies for state program efficiency evaluation with the view of their possible adaptation to the current specifics of territorial-sectoral complex functioning, which is characterized by the increase of negative exogenous impact and low economic growth in key sectors of the domestic economy.

3 The algorithm of an adaptive strategy development for food security provision

The declared priority directions of state support and target indicators are perceived by the regional authorities as static indicators (Kulagina N.A. 2014), the achievement of which does not require a permanent modernization of the public administration system, as well as the construction of a well-established system of interrelations not only within state structures, but also with the business community representatives.

There is a significant differentiation on the evaluation of individual instrument use at the regional and federal levels, which makes it difficult to replicate the successful experience of the territorial agro-industrial complex support to other RF subjects.

In this regard, it is necessary to develop an adaptive strategy on the basis of existing approach generalization and the testing of successful experience concerning the state support of territorial agro-industrial complex taking into account the identified basic trends of socio-economic development for meso-level systems, as well as the accumulated territorial and branch potential of import substitution.

The following problems can be identified as the main problems in the field of strategic planning and food security provision (Beketov N.V. 2009, Food security in Russia: monitoring, trends, threats. - Moscow: FSBEI HPE RANHiGS, 2014.):

- a low level of regulatory and legal regulation of economic entity and public authority activities in the agro-industrial complex, and thus, the lack of a single generally accepted methodological base in the field of strategic planning and food security provision;
- the mismatch of interests between the representatives of government authorities at the federal and regional levels, which leads to the lack of a clear relation between the available resources of state programs implemented in RF subjects and real needs;
- an ineffective interaction of executive authorities with private business leads to the fact that agricultural producers are not interested in long-term investment project implementation aimed at food security level improvement;
- a relatively low level of approved programs and concepts in the field of economic security and its food component provision, which leads to the discrepancy between goals, objectives, tools, planned results, indicative characteristics of their implementation effectiveness, and an ineffective system for the monitoring of such program implementation.

It is obvious that in modern conditions, when a negative external impact is accompanied by the lack of sustained rates for socio-economic development of the country, a joint coordination of efforts between the federal center and the regions, and also between the state and business is a necessary condition for an effective implementation of food security increase strategy (5). Such coordination will facilitate an effective implementation of planned investment projects in the agro-industrial complex by creating the mechanism for their multicriteria adaptation in accordance with the strategic priorities ensuring an acceptable level of food security. In this regard, in our opinion, it is advisable to develop and approve an algorithm for agro-industrial complex support program adaptation with the existing strategies and programs, and to develop a procedure for medium- and long-term goal and priority adjustment in the event of their inconsistency with a current socioeconomic situation.

A key aspect in an adaptation strategy development for food security provision will be the formation of a mechanism for the harmonization of economic agent interests, which is implemented on the basis of the following algorithm.

1. The determination of key areas for the development of territorial agro-industrial complex in the context of food security provision and the determination of state support instruments with the view to selected investment project implementation. The

following options for private investor attraction are possible (Davnis V.V. 2006):

- The realization of an investment project by the representatives of private business independently without a stimulating influence of the state;
- The attraction of investors external to a region, i.e. from other RF subjects, and from foreign states;
- The attraction of local investors.

The second option associated with the attraction of external investors involves an active policy to promote the investment image of a region, the positioning of the Stavropol Territory as a subject with a favorable investment climate. For example, the stavinvest.ru portal (Investment portal of the Stavropol Territory) presents a number of investment projects in the implementation of which a region is interested, and the executive authorities of the area participate in business forums actively, organize their own sites for the promotion of projects, and interact with the representatives of the Chamber of Commerce and Industry.

At the second stage of the algorithm, it is necessary to conduct a comprehensive assessment of an investment project for its conformity with food security provision and its economic social efficiency. The evaluation results make it possible to decide whether it should be supported by the regional authorities if it meets the specified criteria, and its implementation will fit into the system of strategic priorities of the regional agricultural business development. In addition to the standard criteria that characterize the existence of a socio-economic effect, it is also necessary to take into account the indicators identified by federal program-target documents. These criteria can have both a quantitative and a qualitative assessment and can be classified as follows (Vertakova Yu.V. 2006):

- the criteria of general economic efficiency, including the growth of agricultural production, the improvement of produced product quality, the increase of value added, the growth of GRP, etc.;
- the criteria of budgetary efficiency that allow to assess the potential growth of tax revenues in the budgetary system due to the increase of RF subject taxable base in a medium and a long term;
- the criteria of social efficiency, including the prediction dynamics in terms of new job number, the increase of population income level, the increase of quality food product availability according to price parameters, etc.;
- criteria that characterize the environmental component of a project implementation, for example, the introduction of new energy and resource-saving technologies, the production of environmentally friendly food, etc.

The third stage of the algorithm assumes the completion of the preparatory work for a project and it is aimed at the coordination of a potential investor and regional authority interests on the basis of signing an investment memorandum between the parties and in legal drawing up of the party rights and obligations.

The following investor duties can be identified as the main ones:

- economic efficiency provision for an investment project implementation;
- the fulfillment of social obligations;
- the compliance with the requirements of standards for the production of high-quality environmentally friendly food;
- the coordination of project implementation objectives with the strategic priorities for food security provision at the level of regional authorities;
- the priority development of industries with high added value and the introduction of modern technologies with the aim of import dependence overcoming in key areas;
- the production of export-oriented agricultural products with a high level of competitiveness in global markets and the development of foreign economic relations.

At the fourth stage of the proposed algorithm, the adaptive function is introduced, which consists in the process of strategy adjustment for food security provision or in the adjustment of an investment project technical and economic indicators. The coordination of business project participant interests must take place considering the existing industry potential (Kleiner G. 2006), which will allow to form a dynamically developing territorial and branch system that will allow the most efficient use of potential opportunities and will allow to satisfy the social and economic needs of the territories on the one hand, and will make an investment project economically attractive for business, on the other, especially taking into account the provision of tax incentives (Molodykh V. A., Rubezhnoy A. A. 2017).

It should be noted that the proposed algorithm is a universal one and its implementation allows to perform a phased adaptation of investment projects to the strategic goals and objectives of social and economic development in regions. However, it is necessary to note a number of specific features in the context of food security provision.

4 The model of investment project efficiency evaluation in the context of food security provision

Comprehensive comparative assessments of project options and the activities for the development of regional AIC, aimed at food security provision, are determined by the following formula:

$$Q_{ПП} = \alpha_1 \varphi_{ЭКОН} + \alpha_2 g_{СОЦ} + \alpha_3 h_{ЭКОЛ} \quad (1)$$

Here $\varphi_{ЭКОН}$, $g_{СОЦ}$ and $h_{ЭКОЛ}$ are calculated as the arithmetic mean values from the dimensionless coefficients of project contributions according to private contribution indicators:

$$\varphi_{ЭКОН} = \frac{1}{3}(\varphi_1 + \varphi_2 + \varphi_3);$$

$$g_{СОЦ} = \frac{1}{2}(g_1 + g_2); h_{ЭКОЛ} = \frac{1}{m} \sum_{i=1}^{m_1} h^s. \quad (2)$$

α_1 , α_2 , α_3 , $\alpha_1 + \alpha_2 + \alpha_3 = 1$, are the relative coefficients of the growth significance concerning economic, social and environmental benefits for food security provision. If α are set in %, then $Q_{ПП}$ indicates the amount of percent

according to which this development project of the agroindustrial complex corresponds to the goals of food security.

The practical implementation of the developed model, as well as the methodology of investment project complex comparative assessments, were carried out on the basis of the leading agricultural producers of the Stavropol Territory with the use of the specialized software product "Project Expert".

Three agricultural organizations in the region were selected as investment projects, the implementation of which can lead to food security level increase.

1. The construction of the agro-industrial park "Stavropol". The private investor of LLC "Agro-industrial park" Stavropol". The aim of the project is the creation of a modern production and sale infrastructure that unites several links in the chain of agro-industrial production. For this purpose, the development of the following key areas is planned on the territory of the Regional Industrial Park: a meat processing plant, fruit and vegetable facility, vehicle repair facility, the plant for frozen vegetables and sublimed product manufacture, corn deep processing plant and related industries. The project implementation period is 9 years, the amount of investments is 9.3 billion rubles. It is planned to create 150 jobs with an average salary of 27.0 thousand rubles;
2. The development of intensive plant growing "IRRICO". Private investor LLC "Agricultural Industrial Holding "Agroinvest". They plan to grow 60,000 ha of corn, soybeans and potatoes (using irrigation), as well as wheat, rapeseed and sunflower (without irrigation), using advanced agricultural technologies and high-performance equipment. The cost of the investment project is 3.63 billion rubles, the number of created jobs makes 135, the project implementation period is 6 years.
3. The construction of a 4-hectare greenhouse complex. The private investor LLC "AgroVostokGrup". A year-round production of vegetable crops (tomato / cucumber) is planned in the volume of about 8 thousand tons per year. The cost of sales makes 1.2 billion rubles, the implementation period is 4 years.

According to the proposed methodology, they calculated comprehensive assessments of the project contributions to the achievement of the financial, economic and social goals of the agro-industrial complex development of the Stavropol Territory:

φ_1 , φ_2 , φ_3 , and g_1 and g_2 and the integral indicators $\varphi_{ЭКОН}$ and $g_{СОЦ}$ were calculated.

Table 1 presents multi-dimensional estimates of project contributions and the integral indicators of their financial, economic and social efficiency.

Table 1 The Summary of Multidimensional Estimates for Project Contributions

Indicators	1	2	3
Financial-economic efficiency			
φ_1	1,33	2,60	0,30
φ_2	0,85	0,90	0,92
φ_3	0,31	1,30	00,214
$\varphi_{ЭКОН}$	0,890	1,600	0,478
Social efficiency			
g_1	0,007	0	0,03
g_2	1,165	1,418	0,730
$g_{СОЦ}$	0,586	0,709	0,380

According to formula (1), comprehensive comparative assessments of the proposed project efficiency were obtained. At that, the values of the weight coefficients α were taken from the following considerations. In order to solve the problem of food security provision in modern conditions, financial, economic and social problems are equally topical, and they are closely interrelated. Therefore, without large errors, it could be assumed that these benefits are equivalent for a region, i.e. $\alpha_1 = \alpha_2 = 0,5; \alpha_1 + \alpha_2 = 1$.

Table 2 Comprehensive comparisons of projects

Projects	Indicators			Percentage of compliance with the territory development goals, %	Project rating number
	$\varphi_{экоп}$	$g_{соц}$	Q_{np}		
	$\alpha_1 = 0,5$	$\alpha_2 = 0,5$			
1	0,89	0,586	0,738	73,8	2
2	1,60	0,709	1,155	115,5	1
3	0,478	0,380	0,429	42,9	3

With a large number of competitive projects, a threshold level of selection can be established as the percentage of compliance with development goals, depending on available support and incentive resources.

5 Conclusion

The implementation of the proposed adaptive strategy for food security provision does not mean that regional authorities are abstracting from the solution of interaction problem with private investors. On the part of the state, it is necessary to simplify as much as possible the procedure for their interaction with business from the standpoint of bureaucratic procedure minimization, and to offer comfortable conditions to support the investment project anticipated for implementation.

One of the main reasons for the low efficiency of government program implementation to support the domestic economy in general and individual sectors in particular is the rejection of regional authorities from the targets set in the programs and the "free interpretation" of individual support tool use, which does not allow to achieve the planned goals (Rose M.J., Daelenbach U.S. 2003). In our opinion, this discrepancy is related to the specific functioning of individual territorial and sectoral complexes, the existing social and economic potential of the regions and other factors that do not allow a mechanical copying and the use of the tools embedded in federal programs. Moreover, the adaptation of government programs for food security provision must occur and can be implemented on the basis of a wide range of instruments, the expediency of their use depends on a number of factors directly, both objective and subjective ones.

During the consideration and the selection of investment projects aimed at food safety provision an important methodological issue is to determine the strategic objectives for which it is directed. To do this, you can use the following characteristics:

- The scale of implementation: the project should be a large one with long-term goals, the implementation of which will allow to create new trends in the development of regional AIC or modernize the existing technological processes radically within the established chains of production and the sale of agricultural products;
- Social significance: the project implementation will increase the economic potential of the territory on the one hand and will lead to the increase of food quality increase for the population on the other;
- There is a significant multiplicative effect: an investment project will contribute to the development of the entire regional AIC through the subsequent involvement of related industries, for example, the processing of agricultural products or the creation of supply chains to enter global markets.

Table 2 summarizes the results of calculations.

Thus, according to the developed methodology for the assessment and the selection of projects for their support and incentives, the most preferable of three presented projects are the projects of LLC "Agricultural Enterprise "Agroinvest" and LLC "Agroindustrial Park "Stavropolye", which meet the goals of food security provision at 115,5% and 73.8% respectively.

The implementation of an adaptive strategy implies the need for monitoring and control procedures. At that, all projects included in the list of priority projects are to be monitored and their implementation implies the use of state support tools, and control procedures include, first of all, the overseeing of the targeted expenditure of allocated budget funds for the projects included in a co-financing plan. Also, it is necessary to highlight the current assessment of the effectiveness concerning the implementation of investment projects based on a set of indicative criteria as the main monitoring function.

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Primary Paper Section: A

Secondary Paper Section: AE, GM

FATHER AND HIS ROLE IN THE CURRENT FAMILY

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Abstract: The article presents the results of the research aimed on the role of the father in the current family from the point of view of three generations. The research was carried out in the period from January to April 2017 with a selected sample of respondents formed by the representatives of three generations - students, parents, grandparents. The results of the research were processed by means of chosen statistic methods. It was proved with the research that the opinions of respondents about the role of the father in the current family are, statistically, significantly dependent on the belonging of respondents to the particular generational group - students, parents, grandparents.

Keywords: family, father, role of the father, χ^2 - test

Introduction

Already for several decades the attention of the specialised public has been aimed on the phenomenon of maternity and the question of its instinctive basis, the problem of the maternal love, etc. Paradoxically, the phenomenon of paternity has not been very interesting until now. Less attention has been paid to the importance of the paternity in the education of children by the experts and the laic public. However, the role of the father has been reevaluated currently and it seems that its influence is much more important and multifaceted than it was supposed by the scientists concerned predominantly with the maternity.

1 Role of the father in the family

The sociological researches showed that the function of the father has changed more significantly than the function of the mother in the last decades (Možný, 1990; Miller, 2011; Bosoni, 2014). The paternity is getting into the centre of investigation and more attention is paid to the father, his role in and outside the family (Parke – Stearns, 1993; Marsiglio, 2000; Huffman et al., 2014). The main topics of the researches include the paternity after the divorce, the organising of the parental responsibility after the breaking of the marriage or partnership, the transformation of the paternal role, the traditional vs. modern perception of the paternal role, the transformations of the father's position as a main breadwinner of the family, the changing division of work between the father and the mother in the family, etc. From the point of view of forming the child's personality it is important to investigate the presence or absence of the parental person represented by the father, his influence on the psychic and social development of the child (Warshak, 1996), the intimacy of the current fathers (Dermott, 2008), the influence of their work on the performance of their role of the father (Huffman et al, 2014) or the influence of their income on their educational methods (Burbach et al., 2004).

It is possible to see the changes happening in the role behaviour inside the family also in Slovakia and the Czech Republic. This changing attitude is proved by many researches, e.g. Bútorová (2008), Bausová (2002), Holubová (2006), Filadelfiová et al. (2006), Maříková (2004), Chaloupková (2005). These studies analysed the position of the father in the family and the transformation of the parental roles.

We have to understand the paternity in the close connection with the social conditions and relationships which strongly influence the life of the father and his family. As Biddulph (2004) says there is always a typical perception of the ideal paternity in each historical period. These imaginations have been kept during the course of the history and they still form a part of our understanding of the reality in the form of archetypes or stereotypes. According to Hobson and Morgan (2002), it is necessary to perceive the definition of the concept of the father also in the relationships oriented towards the mother and

children where the first relationship (with the mother) influences the other relationship (with the child). Similarly, Badinter (1998) and Dermott (2008) state that it is not possible to talk about one member of the family micro-community without mentioning the other two members (the child and the father or, respectively, the child and the mother). The relevant roles of the father, mother and also of the child are determined by the dominant values and needs of the given society.

The definition of the contents of the father's role is a part of a particular discourse which is included in the discussion about the "old" and "new" father. The set of rights, obligations and responsibilities of men performing the parental role is closely connected with the discourse on the topic of the tension between the "cash" and the "care" (Hochschild, 2003). According to Dudová (2008), we can perceive the role of the father in the family by looking at two basic sources which the father can offer to his child: money ("cash") and time ("care") but, at the same time, she states that these two sources are mutually competing. The more financial resources the father earns, the less time he has to spend with his child, for playing with him/her, for his/her education and other activities. Many authors (Možný, 1990; Smit, 2002; Bosoni, 2014) think that the economic activity of the man and its importance for the family have significantly changed during the last one hundred years. The position of the father as the breadwinner has weakened with an important exclusiveness. Also today the primary task of the father is to ensure his children financially, though this part of the social fatherhood is currently not such a dominant task as it used to be in the past. According to Bocchicchio (2007), the current fathers are actively participating in the lives of their children. Their roles have spread in such a way that they include expressing of their love to their children as well as reacting to their needs.

Whereas the role of the fathers in the education of the children was considered to be marginal till the 70's of the 20th century (Daniels-Weingartner, 1983), the researches carried out in Great Britain in the 80's confirm the increasing participation of fathers in the care for their children (Lewis et al., 1981). Fathers started to spend more time with their children than the previous generations of fathers and the emotional level of the relationship between the father and the child increased as well. Also the recent researches show that fathers fulfil more caring tasks which were traditionally reserved exclusively for mothers (Askari et al., 2010; Bretherton et al., 2005).

2 Research of the role of the father in the current family from the point of view of three generations

2.1 The project of the research

Based on the knowledge mentioned above, we carried out a research aimed on obtaining opinions of the respondents about the role of the father in the current family depending on the age of the respondent. The research was aimed on finding out the opinions of the public about the role of the father in the current family from the point of view of three generations. When investigating the role of the father, we paid our attention mainly to two aspects of his acting in the family: 1. division of work between the man and the woman, 2. the contents of the father's role. *The aim* of the research was: 1. to compile the opinions of the public about the role of the current father from the point of view of three generations, 2. to find out whether the age and the belonging to one generational group determine the opinions of the respondents about the role of the father in the family, i.e. to find out whether there exists a statistically significant difference in the opinions of the respondents about the role of the father in the family from the point of view of three generations. Regarding the needs of our research we set the following research *questions*: 1) Do there prevail the traditional opinions about the education of children, i.e. is the education and care for children connected primarily with the mother? 2) Is the traditional view at the division of work in the family

predominant or is the egalitarian, symmetrical division of tasks in the family preferred? 3) What is expected from the current father: the ensuring of material resources or the active participation in the family life?

The research sample consisted of students of universities, their parents and grandparents from different regions of Slovakia. The total number of respondents was 333 and they were divided into three groups. The first group was formed by 132 students of universities, in the second group were 118 parents and the third group consisted of 83 grandparents. In the set there were represented respondents of both genders and all marital statuses coming from villages and towns and having a different level of achieved education.

In order to obtain the research data we used a non-standardized questionnaire - the same for all three research sets. The questionnaire involved the Likert scale for measuring the attitudes and opinions of the respondents with the aim to specify their level of agreement or disagreement with the given statements on a 5 - degree scale: 1 - I totally agree, 2 - I rather agree, 3 - I cannot express myself, 4 - I rather disagree, 5 - I totally disagree. Based on the results of the research, we found out that the opinions of respondents of the relevant generational groups differ from each other. The aim of the statistic analysis was to ascertain whether these differences are also statistically significant, i.e. whether the answers of the respondents of three groups to the particular statements are dependent on the belonging of the respondents to their age group (students, parents or grandparents). Therefore we tested the dependence of two nominal characters A, B where the character A - the status of the respondent - achieved three levels: a student, a parent or a grandparent and the character B - represented possible answers to the given statement. In the statistic analysis of the obtained data there was used the χ^2 - test for verifying the independence of two qualitative characters A, B . We tested the zero hypothesis H_0 : the characters A, B are independent versus the alternative hypothesis H_1 : the characters A, B are dependent. The testing criterion is the statistics χ^2 defined by the relation $\chi^2 = \sum_{i=1}^n \sum_{j=1}^m \frac{(f_{ij} - o_{ij})^2}{o_{ij}}$, where f_{ij} are empirical numbers and o_{ij} are forecast numbers. We deny the tested hypothesis H_0 at the level of significance α if the level of the tested criterion χ^2 exceeds the critical level $\chi_{\alpha}^2(r)$ (Markechová – Stehlíková - Tirpáková, 2011). We performed the test by means of the programme STATISTICA. In the output set of the computer we obtained the contingent table, the value of the testing criterion χ^2 - test and the value of p meaning the probability of a mistake we make if we deny the tested hypothesis. If the calculated value of p is relatively small ($p < 0,05$, resp. $p < 0,01$), we deny the tested hypothesis H_0 about the independence of the observed characters A, B (at the level of significance 0,05 resp. 0,01). We will evaluate the test on the basis of the calculated p -values and, subsequently, we will present the results in the tables.

2.2 The analysis of the research results

Regarding the research aims mentioned above, in the analysis of the research data we verified by means of χ^2 - test whether the opinions of three groups of respondents about the given statements are significantly different. Therefore we tested the dependence of two nominal characters A, B where the character A - the status of respondents - achieved three levels: a student, a parent or a grandparent. The character B - answers to the statement - achieved five levels (1 - I totally agree, 2 - I rather agree, 3 - I cannot express myself, 4 - I rather disagree, 5 - I totally disagree).

The first set of statements (No.1 and No.2) was centered on the gender aspects of the parenthood, i.e. on the performance of the parental role by the mother and father. Our aim was to find out whether in the answers of respondents prevail the traditional

opinions about the education of children saying that the education and care for children is primarily connected with the mother. We examined the opinions of respondents about the statement No. 1 "The child needs both parents, even though the parents do not live in the common household" and the statement No. 2 "The woman can look after the child better than the man". We tested the statistic significance of the differences in the answers of the respondents of three groups to the statements No. 1 and No. 2 by means of the χ^2 - test. The results are stated in the Table 1.

Table 1 Results of the χ^2 - test

Statement	χ^2	p
No.1	10,120	0.256
No.2	50,257	0,000*

The values of probability p smaller than the stated level of significance $\alpha = 0,05$ are marked with an asterisk * in the table 1. Based on the results mentioned in the Table 1, we can sum up that the differences in the opinions of the respondents of three groups about the fact whether the child needs both parents, even though the parents do not live in the common household, were not statistically significantly different. However, the results of the test proved that the differences in the opinions of the respondents of three groups were statistically significantly different when the respondents answered to the statement whether the woman can look after the child better than the man. It was also verified with the analysis that the respondents of all three groups agree with the need of participation of both parents in the education of the child. This is also valid when the parents do not live in the common household. All three groups of respondents also agreed that personal contacts with both parents are necessary for the child (students: totally agree 71%, rather agree 23%; parents: totally agree 62%, rather agree 29%, grandparents: totally agree 69%, rather agree 19%). On the basis of the results obtained with the analysis of the answers to the statement No. 2 "The woman can look after the child better than the man", we can see the highest level of agreement with the given statement in the group of grandparents (61%), there were 43% of grandparents totally agreeing and 18% of them were rather agreeing. Therefore we can state that the generation of grandparents has the most traditional opinions about the education of children, i.e. they give the educational competence rather to the woman than to the man. The parents and students agreed to a lesser extent with the fact that the woman can look after the children better than the man, i.e. they attribute the same ability to the men as well.

The second set of statements (No. 3 - 8) was centered on the division of work in the family between the man and woman with the aim to find out whether the opinions of respondents about the employment of women have become more modern or there are still prevailing the opinions about the traditional division of tasks in the family (the woman cares about the household and the education of children, the man earns money). We tested the statistic significance of differences in the opinions of the respondents of particular groups about the following statements:
 3. The man has the right for the professional self-fulfillment.
 4. The woman has the right for the professional self-fulfillment.
 5. The family should be economically ensured primarily by the man.
 6. The family should be economically ensured primarily by the woman.
 7. The family should be economically ensured by both spouses/partners.
 8. The task of the man is to earn money; the task of the woman is the care for the household and children.
 Once again we tested the statistic significance of the differences in the opinions of three groups of respondents about the statements No. 3 - 8 by means of the χ^2 - test (Table 2).

Table 2 Results of the χ^2 - test

Statement	χ^2	<i>p</i>
No.3	12,189	0,143
No.4	17,615	0,024*
No.5	39,466	0,000*
No.6	10,686	0,220
No.7	9,125	0,331
No.8	37,012	0,000*

On the basis of the results mentioned in the Table 2 we can state that the respondents of three groups answered to the statements No.4, 5 and 8 in statistically significantly different ways. It means that there was proved a higher level of acceptance of the employment of women in the group of students (87%) and in the group of parents (83%) when compared with the group of grandparents who accept the employment of women only in 73%. In this group, 12% of grandparents do not even agree with the right of the woman for the professional fulfillment. At the same time, in the highest extent (73%) they accept the obligation of the man to ensure the family economically. The same opinion is held by 66% of parents and 63% of respondents from the student group. Similarly, the traditional division of work is accepted almost by 63% of respondents from the group of grandparents. However, only 46% of parents and 35% of students agree with this opinion. Therefore we can sum up that the grandparents perceive the role of the man in the family in a more traditional way. They connect it with the role of the breadwinner of the family in a higher extent than the parents and students do when perceiving this role.

In the statistic analysis of the answers to the statements No. 3, 6 and 7 there was not proved a statistic significance of differences in the opinions of respondents of three groups. It means that all three groups of respondents (87% of students, 84% of parents and 82% of grandparents) accept the right of the man for the professional fulfillment and they also refuse the role of the woman as the breadwinner of the family (74% of grandparents, 71% of parents and 61% of students). All three groups also accept the egalitarian participation of partners in the financial ensuring of the family (92% of students, 89% of parents and 88% of grandparents).

The third set of statements (No. 9 - 11) was aimed on the role of the father in the family. By means of the χ^2 - test we tested the statistic importance of differences between the three groups of respondents in their opinions about the following statements:

9. The man needs a child to feel the complete satisfaction with his life.

10. The most important life aim of the man is to earn as much money as possible and to make career.

11. The most important decisions in the family should be made by the man.

The results are recorded in the Table 3.

Table 3 Results of the χ^2 - test

Statement	χ^2	<i>p</i>
No.9	32,381	0,000*
No.10	6,875	0,550
No.11	16,801	0,032*

Based on the results mentioned in the Table 3, we can confirm that the respondents of three groups answered to the statements No. 9 and 11 statistically in a significantly different way. It is clear from the answers of the respondents that it is the group of the grandparents which attributes the biggest importance in the life of the man to his child (60%) when compared to the group of parents (42%) and students (37%). We can say that, with the growing age, the respondents attribute a bigger meaning to the child in the man's life. It was confirmed with the research that the respondents hold a dismissive attitude to the position of the man as the "head" of the family. The biggest disagreement with the statement about the position of the man as the head of the

family was expressed in the group of parents (73%), followed by the group of grandparents (64%) and students (62%). The dismissive attitude towards the statement "the most important decisions in the family should be made by the man" expresses the preference of the egalitarian relationships in the family between the man and the woman. However, the dismissal or acceptance of this task of the man proved to be statistically different regarding to the belonging of the respondents to a particular generational group.

A statistically significant difference between the groups of respondents of three groups in the answers to the statement No.10 was not confirmed with its analysis. All the groups of respondents presented an ambivalent approach to the life objectives of the man to earn money and to make career, i.e. there was not shown a significant level of accepting or dismissing this statement. In a higher extent, the respondents expressed their disagreement with the mentioned role of the man defined in the statement No. 10 (46% of students, 53% of parents and 47% of grandparents). On the contrary, 30% of students, 22% of parents and 36% of grandparents agreed with this statement. We can see from the mentioned results that there are not explicit opinions of the respondents about the man's life objectives connected with his work. Though they hold the opinion that the man has the right for the professional self-fulfillment and he has to ensure the family economically, on the other hand, our results showed that these were not his most important tasks.

When comparing the answers of the respondents according to their generational group, it was evident that mainly the group of grandparents (65%) connected the role of the father with the traditional role of the breadwinner. Only 39% of parents held the same opinion. Students and parents have higher expectations connected with the role of the father in the emotional area. This topic was expressed in the statements "the father should provide a feeling of safety to the children" (64% of students, 63% of parents 51% of grandparents) and "the father should show his love and feelings to his children" (58% of students, 47% of parents, 47% of grandparents). Less important for the respondents were the following tasks of the man "to prepare the children for life" and "to lead the children to discipline". Almost nobody of the respondents connected the role of the father with the preparation of children for the lessons and with the everyday care for the children.

Discussion and conclusions

In the submitted study we tried to approximate and analyse the fatherhood as a significant sociological phenomenon which represents an important part of many studies about family not only abroad but also in Slovakia. The fatherhood has become a subject of many researches at a different level of interdisciplinary investigation as well as a topic of media presentation and discussion. Regarding the transforming role of the father in the family we tried to find out the opinions of respondents from the point of view of three generations. It is evident from our research findings that there is generally present the norm about the participation of both parents in the education of children, also after the breaking of their relationship, and all the respondents are aware of this need. Our results confirm their opinion that the common bond between the divorced (leaving) parent and the child is getting weaker mainly after the divorce when they stop living together (Arendell 1995; Bradshaw et al. 1999).

The weakening preference of the mother as a more competent person in the care for the children can be understood as an advantage for the current fathers. It is clear from the opinions of students and parents that they do not perceive the parental role primarily connected with the mother. In the group of grandparents prevails the traditional understanding of the parental role and they attribute education and care for children primarily to the mother. On the basis of our results we can confirm that the grandparents still hold the traditional opinion about the role of the woman as an educator and housewife what

is also related to the lower acceptance of the employment of the woman. Our findings are similar to the research carried out by Bútorová (2008). According to her, people in Slovakia are still convinced that the woman has a bigger competence to care for the household despite certain changes in this opinion. However, there are less and less people in Slovakia who openly think that most of the care for children and household should be attributed to women.

The research also confirmed that the dual-income families are common at this time and, due to this fact, the respondents of all three groups accept the participation of both partners in the economical ensuring of the family. At the same time, they have a clear idea about the obligation of the man to ensure his family economically, though they have less explicit ideas about the participation of the woman in this task. We found out that the group of grandparents holds the most traditional opinions about the role of the father in the family, they perceive the man as the breadwinner and instrumental leader of the family in a higher extent than the parents and students do. It is evident from our findings that in the society there is a dismissive attitude towards the traditional status of the man as the leader of the family but there still prevails the accepting of his breadwinning role. Our results correspond with the general perception of the man that is still strongly oriented on his economic contribution to the family. The qualities of the man can be seen in the life standard he can provide to his wife and children, i.e. he still has the status of the breadwinner of the family (Možný, 1990; Bosoni, 2014).

Our research also proved the fact that the position of the father as the breadwinner has been weakened after the women entered the labour market. At the same time, it means higher involvement and participation of men outside their breadwinning role and their traditional tasks and obligations. We can see that the society has a double system of expectations: on one side, the father is supposed to perform his traditional role of the breadwinner (to ensure the material needs) and, on the other hand, he has to participate in the positive emotional climate in the family. As Coltrane (1995) and Bocchicchio (2007) say there is spreading of the new paternal practices and beginning of the era of the so called new fathers. The father is more and more supposed to move his position from the biological fatherhood to the social fatherhood, from the breadwinning role to the caring role, from the passive consumer to the active, participating member of the family (Askari et al., 2010; Bretherton et al., 2005).

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Primary Paper Section: A

Secondary Paper Section: AO

MONETISING CONTENT THROUGH DELIVERY OF ADVERTISEMENTS: THE CASE OF AD BLOCKERS

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This paper originated as the result of working on the grant scheme VEGA 1/0637/17 Construction of the consumer decision-making model for the segment of mobile health focused on the identification of attributes influenceable by marketing tools.

Abstract: Websites using content as their main asset need to ensure a steady revenue flow from their digital projects. Along with the subscription models, this is mainly achieved by the efficient delivery of advertisements (ads) to their readers. Website users stand as an opposition to this initiative, protecting their privacy and trying to improve their user experience, often by using ad blocker software to block advertisement while browsing the internet. As an effect, content publishers are losing revenues directly related to the number of impressions of the advertisements. The aim of this article is to determine the opportunities for content publishers to effectively deal with this problem by looking at the types of advertisements being served and the response of publishers towards the use of ad blockers. This was achieved by using an empirical study of 105 websites from seven countries out of several categories, including the targeted audience segment and the type of the website (i.e., premium or non-premium). By using content analysis and descriptive statistics, the prevalent advertising formats were determined, the reaction of publishers towards people using ad blockers was analysed. Based on the identification of issues and problems, this article introduces opportunities for content publishers to monetize their content better through improved efficiency of delivering advertisements.

Keywords: Ad blockers, advertising revenues, content publishers, online advertising

1 Introduction

Publishers of digital content are looking for ways of increasing their revenues to sustain their businesses. There were numerous cases from the past when the publisher (medium) was not able to survive because of the changing user preferences and behaviors of its readership base, leading to necessary transformation challenges. As online advertising becomes a great part of the revenue stream, publishers are trying to display as much advertising as possible. They are also looking at alternative sources of income including the enhancement of their subscription models. Ensuring effective displaying of the advertisements (ads) they get from direct sales or through programmatic channels and different advertising networks, however, is key for their survival and development. This article deals with the topic of ensuring the effective delivery of advertisements by the digital content publishers, taking into account the change of users' preferences and their inclination towards a better ad-free browsing experience. The presented research reveals what types of advertising formats are displayed on the websites of selected publishers and what strategies the publishers use to address the issue of the increasing penetration of ad blockers by their readers.

2 Purpose and Methods

Publishing high-quality content requires significant resources. Print media have been experiencing a continuous decline in their readership and have transformed to the digital form (i.e., solely or in combination with print). In print, advertising was easy: The advertiser paid for the chosen format and it was included in the print edition. Readers were able to see it, skip it and ignore it, but they were not able to block it. In the digital form, however, readers of the website have the opportunity to avoid seeing ads completely by blocking them. Because of the nature of the advertising revenue stream, by losing the ad views and ad clicks, publishers also lose revenue from advertising.

Thus, the aim of this research is to determine the opportunities for content publishers to effectively deal with this problem by looking at the types of advertisements being served and the responses of publishers towards the use of ad blockers. Three sub-goals have been defined to support the achievement of the main research goal:

- Evaluate the number of ads on various websites and compare the data based on these two categories: (1) the target audience segment and (2) the website type (i.e., premium or non-premium).
- Detect the frequency of using various advertising formats to check if advertisers incline towards using user-friendly ads or push invasive ad formats.
- Determine how publishers deal with visitors having an ad blocker turned on and explore the various responses of publishers to this situation.

To achieve these goals, the authors have conducted an empirical study that focused on 105 websites from seven countries: U.S., Canada, UK, Netherlands, Spain, Germany and France. In every country, 15 websites were included in the research sample from various segments, such as: cars, entertainment, technology, gaming, lifestyle, movies, news, sports and weather. Each website was assigned a type from one of the two categories, either premium or non-premium, with 51% being premium and 49% being non-premium. A website was considered as premium if it had a parallel print version, it was created and maintained by a TV station or it was part of a larger group of local media. Data employed in the research was collected throughout the months of October and November 2017.

The method of content analysis was applied as a qualitative-quantitative method of analysis of website content, aimed at detecting the state of the art on the evaluated websites for these groups of parameters: (1) the number of ads on the homepage, (2) the types of ads used and (3) the solutions for targeting ad blockers and the response of publishers towards users with the ad blocker turned on. The number of ads on the homepage was determined by counting all the ad formats that were displaying any form of advertisement.

Within the second group, various ad formats were detected according to their type across the website, including the homepage and the article page. Standard banners represent ads that have their defined size and are not defined as invasive (e.g., popups, banners changing their dimensions – which are hard to close by users – etc.). Also, retargeting was detected because if in place, it can improve the user's experience as banners are displayed that are relevant to content people have viewed before. Native advertising was detected, too, as it represents a form that users tend to accept more because it usually offers information interesting to the readers. Moreover, the detection was made without the ad blocker turned on. Thus, the following four parameters were used in this group: (1) use of standard banners, (2) use of invasive banners, (3) retargeting used for advertising and (4) use of native advertisement.

Within the third group of observed parameters, the attitude of publishers towards users with ad blockers was analysed. The aim was to detect if the system (i.e., website technology) detects that a user has an ad blocker turned on and how the publisher responds to this information. One possible approach is educating the readers and explaining to them why they need the advertising revenues and, thus, having their ad blockers turned off. The second approach uses persuasion, which is more intense (e.g., through pop-ups) and informs the user more visibly and frequently. Introducing a special offer is another option where the user gets to choose a discount from the subscription, an ad-free or ad-limited version of the website after fulfilling some criteria. Lastly, some publishers would use threats of blocking the access to the website or content completely if the person does not turn the ad blockers off. The following parameters were checked with the ad blocker turned on: (1) ad block detection and (2) publisher's response to detecting the ad blocker being turned on (i.e., education, persuasion, special offer or threat).

The results were processed using coding with yes and no answers to all parameters except for the number of ads displayed, where an integer number was used. After coding,

results were processed using a spreadsheet editor, and descriptive statistics was used to detect the differences between segments and types of websites and to provide answers to questions defined in sub-goals supporting the main research goal.

Important parameters relevant to the data collection and coding of the results to ensure the future replicability of the methodology are:

- Virtual private network (VPN), which was used to access websites from an IP address of a particular country to get results as close to real situations as possible.
- Each website was visited at least five times with the ad blocker, which includes at least three visits of the homepage and two visits of a particular article.
- Each website was visited at least five times with the ad blocker turned off.
- Browsing data was deleted before visiting websites of another country.
- Browsing data were deleted before switching the ad blocker on and off.
- A subscription pop-up was not considered as an invasive format.
- Mostly leader boards with a fixed position, which overlaid the website content, were considered as invasive formats.
- Recommendation widgets (e.g., Taboola, Outbrain, Livefyre, Plisa, Ligatus, Por, Revcontent, etc.) were considered as native ads.
- A pop-up window with a message was considered as a detection of the ad blocker.
- The Chrome extension, Ad-Block, was used as the ad blocker software solution.

3 Research Background

3.1 Penetration of Ad Blockers

Over the past years, the solutions to block ads on websites have developed, both technically and quantitatively. There are numerous popular applications that can be used to partially or completely block all ads. Internet users are looking for these solutions in attempt to improve their online experience. A growing number of different ad formats on websites and their aggressiveness is causing this trend, too. As Blanchfield (2017) notes, users continue to employ ad blockers as the protection against ads that intrude on security, invade privacy, interrupt user experience, slow pages and expend bandwidth. According to Mozilla (2017), some of the most popular ad blockers include: AdBlocker Ultimate, uBlock Origin, AdBlock for Firefox, Popup Block or Webmail Ad Blocker. The latter deals specifically with ads displayed in an email client, such as Gmail, Hotmail, Yahoo or Outlook.com. Ad blockers can be installed easily by adding an extension to the web browser, and, because of their simplicity and efficiency, the number of people using them has grown significantly. The efficiency of ad blockers is improving; however, both Wills and Uzunoglu (2016) and Malloy, McNamara, Cahn and Barford (2016) have found out that users are still exposed to a number of ads despite having the ad blockers turned on.

According to data from the 2017 Ad Block Report (Cortland, 2017), 616 million devices now use an ad blocker solution, 11% of the global internet population is blocking ads on the web and the ad blocker usage grew 30% globally in 2016. The trend is positive, with 380 million mobile devices and 236 million desktop computers using an ad blocker. The penetration of ad blockers differs from country to country, with regions having similar characteristics. The world highest percentage of users using ad blockers is in Indonesia, where 58% of people access the internet with an ad blocker turned on.

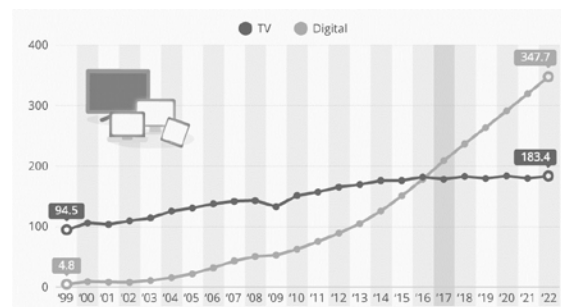
Other studies document the critical relationship of the trend of using ad blockers to the whole online advertising industry. According to Dwoskin (2015), ad blocking software was expected to lead to nearly \$22 billion in lost advertising revenue in 2015, representing a 41% rise from 2014. Jalbă et al. (2016)

argue that a solution needs to be found so that the internet will continue to give us an enormous amount of free information that requires the preservation of the online advertising revenue stream for content publishers.

3.2 Online Ad Revenues as a Significant Income Stream

Digital advertising has been performing well for two decades, showing a constant growth. Its continual growth, along with the change of content consumption patterns, has led to the situation where digital ad spending outperformed the TV ad spending for the first time in 2017. Thus, in the future, the growth is expected to trend upward in favor of digital ad spending (see Figure 1).

Figure 1 Comparing worldwide digital and TV ad spending (in millions of USD)



Source: Loesche (2017)

An analogous situation can be observed when looking at the global advertising expenditure in comparison of newspapers and the Internet. The ad spending in newspapers was higher than the digital ad spending until late 2012; since that time, however, digital ad spending continues to rise (Richter, 2011).

There are many reports, relevant to publishing houses, confirming the decline of the revenue stream generated by print and the rise of the digital revenue stream of content publishers' websites. Malik (2017) states that the share of online advertising revenue has increased from 21% in 2011 to 36% in 2016. Recent statistics from Australia, represented by the News Media Index—which takes data from the NewsMediaWorks' foundation members, News Corp Australia, Fairfax Media and West Australian Newspapers—who represent around 90% of the news media sector, have confirmed this trend. When comparing the third quarter of 2017 with the third quarter of 2016, the year-to-year change on print revenues has been -14.3% with the print revenues totaling \$365.1M whilst the year-to-year change on digital revenue stream was +8.5% with the revenues per quarter totaling \$119.6M (Bennett, 2017). From these stats, it can be calculated that the share of online advertising revenues on the total budget has been almost 24%. However, for smaller publishers and especially purely online publishers, the revenue from advertising is crucial for survival.

3.3 Solutions Applicable by Publishers

Both publishing houses operating a digital content delivery platform and pure online content publishers need to do everything for maintaining or increasing their online advertising revenue stream. To ensure this, they have a number of options that can be executed as part of one coherent strategy. This can help publishers maximize the potential of monetizing the displaying of ads on their websites as a reaction to the growing popularity of ad blockers. It can include two fundamental types of measures:

1. The use non-invasive advertising formats – publishers should shift the focus towards eliminating invasive banners and increasing the share of retargeting formats and native ads that are considered less intrusive by content consumers (Resnick & Albert, 2016). This can help the publishers to fight the banner blindness phenomenon (Hervet, Guerard, Tremblay & Chtourou, 2011) and help all websites on the

internet. Also, it can help an individual website in regard to improving their negotiation position in combination with the second measure.

2. Actively dealing with ad blockers – publishers should consider possible deals with ad blocker software developers to place them on a whitelist, so their ads are displayed despite the users' ad blocker. Alternatively, they can use technical solutions to detect ad blockers on the side of their users (Post & Sekharan, 2016) and, then, target these users with a specific action. These actions can have various forms, including education (i.e., communicate with their audience and inform them about the necessity to display ads), persuasion (i.e., ask them to remove the ad blocker without an incentive or offer them benefits for doing so) or a threat.

4 Research Results

As argued in the previous part of the paper, websites of content publishers need to display ads to secure a steady flow of advertising revenue. Internet users often complain about the number of ads they are bothered with in various forms. Thus, the question is: how many ads are actually being displayed on one page? In this research, the number of ads displayed on the homepage of 105 websites was detected. The results are depicted in Table 1.

Table 1 Number of ads on the homepage of analysed websites

Website Category	Premium	Non-Premium	Total
Cars	30	56	86
Entertainment	98	110	208
Gaming	16	22	38
Lifestyle	91	174	265
Movies	-	26	26
News	199	-	199
Sport	41	12	53
Tech	25	75	100
Weather	-	85	85
Grand Total	583	477	1060

Source: Authors' research

The total numbers can be better interpreted if the quantity of websites in each category (i.e., segment or type) is considered. Table 2 displays the average number of ads per website category.

Table 2 Average number of ads on homepage per website category

Website Category	Premium	Non-Premium	Category Mean
Cars	10.0	14.0	12.3
Entertainment	12.3	8.5	9.9
Gaming	8.0	4.4	5.4
Lifestyle	5.4	15.8	9.5
Movies	-	3.7	3.7
News	14.2	-	14.2
Sport	8.2	6.0	7.6
Tech	12.5	15.0	14.3
Weather	-	12.1	12.1
Category Mean	11.4	8.8	10.1

Source: Authors' research

This view on the data has discovered the interesting disparities amongst the categories, both individually—between types of websites in each segment (e.g., premium sites in the Lifestyle segment show three times less ads than non-premium websites in this segment)—and collectively (e.g., premium websites display more ads on average, or websites from the Tech segment display the most ads on average totalling 14.3 which is almost four times more than websites from the Movies segment with 3.7 ads on average per site).

On average, 10 ads were displayed on the homepage. The maximum value detected was 47 on the homepage of CHIP.de, which is a German website from the Tech segment in the non-

premium type category; whereas, some websites did not display any ads.

The focus of the research was to evaluate the situation in using the solutions included in the two main groups of measures applicable by publishers. Thus, this chapter is structured according these three main types of measures.

4.1 Use of Non-Invasive Advertising Formats

The research has revealed that 98 out of 105 websites (93.3%) had at least one standard banner position that displayed an ad. It has also confirmed the trend of removing invasive ad formats from the web as they are negatively perceived by internet users. Most of the sites were using retargeting (82.9%) and 67.6% of the websites featured a form of native advertising. The data is depicted in Table 3.

Table 3 Use of advertising formats according to the website category

	Standard banners	Invasive banners	Retargeting	Native advertising
Across the types	93.3%	7.6%	82.9%	67.6%
Premium	96.1%	5.9%	82.4%	72.5%
Non-premium	88.9%	9.3%	81.5%	61.1%

Source: Authors' research

The most apparent differences are in the use of invasive banners and native advertising. Premium websites use less invasive banners and utilise the potential of native advertising more than non-premium websites.

In Table 4, the frequencies are displayed according to the segment of the website. Some interesting findings can be observed. For example, only websites in two categories were missing standard banner positions. The biggest variety of values is visible in the use of native advertising. The lowest value of 24% was detected on Entertainment websites, and the maximum 100% on websites from the Cars category.

Table 4 Use of advertising formats according to the website segment

	Standard banners	Invasive banners	Retargeting	Native advertising
Cars	100%	14%	86%	100%
Entertainment	81%	10%	67%	24%
Gaming	100%	0%	86%	43%
Lifestyle	100%	7%	93%	79%
Movies	71%	14%	71%	43%
News	100%	7%	86%	71%
Sport	100%	0%	86%	43%
Weather	100%	0%	100%	29%

Source: Authors' research

There were significant differences in the use of native advertising between the countries. The frequencies are displayed in Table 5. For example, in Canada, only 33.3% of websites use native advertising, whereas in France it is 93.3%.

Table 5 Use of native advertising formats according to the country of origin of websites

Country		Native Advertising		Total
		No	Yes	
Canada	Count	10	5	15
	% within Country	66.70%	33.30%	100.00%
France	Count	1	14	15
	% within Country	6.70%	93.30%	100.00%
Germany	Count	2	13	15
	% within Country	13.30%	86.70%	100.00%

Netherlands	Count	7	8	15
	% within Country	46.70%	53.30%	100.00%
Spain	Count	7	8	15
	% within Country	46.70%	53.30%	100.00%
UK	Count	3	12	15
	% within Country	20.00%	80.00%	100.00%
U.S.	Count	4	11	15
	% within Country	26.70%	73.30%	100.00%
Total	Count	34	71	105
	% within Country	32.40%	67.60%	100.00%

Source: Authors' research

In Table 6, the results of the Chi-Square show that the alpha level of significance is 0.04, being smaller than the conventionally accepted significance level of 0.05.

Table 6 Chi-Square test for variables country/native advertising

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.138	6	.004
Likelihood Ratio	20.150	6	.003
N of Valid Cases	105		

Source: Authors' research

4.2 Dealing with Ad Blockers

Because of the increased use of ad blockers, serving non-intrusive banners is not sufficient; however, it can help publishers to deal with the people with an ad blocker. The most popular solution of content publishers is to have an agreement in place with ad blockers. Forty-four websites (41.9%) had a deal with ad blockers that enabled their site to be put on a whitelist and not be blocked, either completely or partially.

When assessing the measures taken by publishers to detect the use of an ad blocker, it has been found that only 17 websites (16%) had a detection solution in place. Consecutively, these websites were able to target these users. Other publishers were missing the ad revenues because of not being able to show the ads and, thus, the ad tracking system not counting these views. A comparison of the situation between the premium and non-premium websites is shown in Table 7.

Table 7 Agreements with ad blockers and detection of ad blockers

	Agreement with ad blockers	Detection of ad blocker	Any solution (subtotal)	No solution
Across the types	41.9%	16.2%	58.1%	41.9%
Premium	47.1%	21.6%	68.7%	31.3%
Non-premium	35.2%	11.1%	46.3%	53.7%

Source: Authors' research

Premium websites were doing better in having the agreements in place. They had more agreements with ad blockers (47.7% vs. 35.2%), so their banners were displayed more often despite the ad blocker being turned on by the visitor. There are significant differences in the existence of agreements with ad-blockers per country of origin, too. U.S. websites sit on one end of the scale, with only 2 websites having an agreement in place (13.3%). In France, however, such an agreement exists in 13 out of 15 cases (86.7%). The results are depicted in Table 8.

Table 8 Agreements with ad-blockers according to the country of origin of websites

Country	Agreements with ad-blockers		Total	
	No	Yes		
Canada	Count	11	4	15

	% within Country	73.30%	26.70%	100.00%
France	Count	2	13	15
	% within Country	13.30%	86.70%	100.00%
Germany	Count	7	8	15
	% within Country	46.70%	53.30%	100.00%
Netherlands	Count	11	4	15
	% within Country	73.30%	26.70%	100.00%
Spain	Count	8	7	15
	% within Country	53.30%	46.70%	100.00%
UK	Count	9	6	15
	% within Country	60.00%	40.00%	100.00%
U.S.	Count	13	2	15
	% within Country	86.70%	13.30%	100.00%
Total	Count	61	44	105
	% within Country	58.10%	41.90%	100.00%

Source: Authors' research

The Chi-Square test has confirmed the existence of significance at the alpha level of 0.02 (Table 9).

Table 9 Chi-Square test for variables country/agreements with ad-blockers

	Value	df	Asymp. Sig. (2-
Pearson Chi-Square	21.203	6	.002
Likelihood Ratio	22.795	6	.001
N of Valid Cases	105		

Source: Authors' research

Premium websites were better in detecting the ad blockers, too. The number of premium websites with a working ad blocker detection was almost double compared to non-premium websites. In total, 41.9% of the websites did not have any solutions in place, which equaled 31.3% of premium publishers and 53.7% of non-premium publishers.

Publishers that detected the presence of an ad blocker could take consecutive action; in this study, it was 17 publishers (16.2%). Other publishers could still have a piece of information displayed about their advertising policy and the importance of being paid for displaying ads; however, they could not specifically target those people who have their ad blocker on when accessing the page. The two most popular approaches of targeting the users were persuasion and education. Eight publishers utilized the educational approach and tried to explain to their audience why they needed to display the ads. Persuasion was the most prevalent approach with 10 websites displaying a more visible popup, reminding the users that they need to turn off the ad blocker. Only one website offered these targeted users a discount or a web with reduced number of ads if they decide to turn off the ad blocker. Three websites threatened the user to limit his access to the website, either partially or completely. The results are depicted in Table 10.

Table 10 Dealing with users after detecting their ad blocker is on

Website Type	Education	Persuasion	Special offer	Threats
Across the types	8	10	1	3
Premium	7	8	1	3
Non-premium	1	2	0	0

Source: Authors' research

Thus, despite the low figures and the limited ability to generalize based on this data, the frequencies calculated per the website type show significant differences between the two categories of

websites according to their type. Almost all actions were taken by websites from the premium category (19 out of 22).

5 Discussion

Different publishers have different approaches to serving ads on their websites and ensuring their efficient delivery. A contrast can be already seen in the number of ads served. A few of the websites were not serving ads at all, while some had more than 40 ads on the homepage. Premium websites served more ads on average (11.4 per website) compared to non-premium websites (8.8 per website). This can be the effect of the pressure on the publishing house or owners to generate more revenue from online advertising, since the print revenues decline over time. On the other hand, these content publishers seem to understand that they should not bother their users with their ads too much. As the effect, they served less invasive or intrusive banners, compared to non-premium websites (5.9% vs. 9.3%). Also, they focused more on native advertising, with 72.5% of the premium websites having at least one native ad on their website, compared to 61.1% for non-premium. Further analysis has also shown that there are differences amongst the website segments, too. For example, all websites in the Cars segment were using native ads, whilst only 24% of the websites from the Entertainment segment had one or more native ads.

Regarding the course of action to directly influence the number of ads served to users with ad blockers, premium publishers were doing better in having an agreement with the developers of ad blockers. In fact, 47.1% of premium publishers had a deal in place that allowed their ads to be seen completely or partially, compared to 35.2% for non-premium publishers. Moreover, premium publishers were more efficient in detecting ad blockers. However, the number is low: 21.6% for premium versus 11.1% for non-premium websites. Thus, only every ninth non-premium publisher was using an ad blocker detection. In total, there were 31.3% of the premium websites and 53.7% of the non-premium websites that did not have any of these solutions in place.

If the publishers detected the ad blocker being turned on, they generally used one or more of the four described methods (i.e., education, persuasion, special offers and threats). From these, special offers are definitely the option with the most unused potential. Only one website was offering a benefit to users if they turn the ad blocker off. Educating users is a long shot process, while threatening the user might be counterproductive and can cause losing the user (and more users because of the word spreading), either temporarily or permanently. Persuading the user, by showing the appeal more visibly and more frequently, might be a working solution. However, if the user gets a tangible benefit for being exposed to the ads, then the persuasion can be way more effective.

6 Conclusion

The growing number of people protecting their privacy and improving the user experience while browsing the web has led to the increase of installing and using ad blockers. Content publishers have a number of tools available to tackle this problem that causes them to lose income from advertising. As shown in the results of the empirical research, publishers seem to be aware of these risks and already apply some of the available approaches. Reducing the number of invasive banners on the internet will help everyone; however, it will not have the effect of turning the ad blocker off on a particular website. Thus, it is necessary to have a deal with the ad blocker software developers and its users and beneficial to target those users with a specific action. As documented, there are still many opportunities for publishers to ensure a more efficient delivery of their advertising formats and increase the revenue generated from their digital presence.

Regarding the potential future research directions, the authors have identified several areas where another empirical study can extend the current state of knowledge and contribute to having a better picture of the effects of increased worldwide use of ad blockers on content publishers and their advertising revenues.

Firstly, future researchers should replicate the methodology of this study with a different research sample (e.g., include different countries, focus solely on one country and include all websites serving content and advertisements). Secondly, future researchers should target users with ad blockers and use qualitative and quantitative research to determine the factors that would persuade them to turn off the ad blocker. Finally, future researchers should target publishers and use qualitative and quantitative research to determine the reasons why they do not use any targeting methods to identify users with ad blockers, in addition to finding out more about their preferred courses of action once they detect the ad blocker.

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Primary Paper Section: A

Secondary Paper Section: AE, AH, BD

SELF-REFLECTION IN THE INTERACTION STYLE OF TEACHERS

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Abstract: The article emphasizes the importance and functions of the professional self-reflection of teachers. It mentions several methods which support the teachers and they enable them a purposeful and systematic self-reflection. It presents the results of the research obtained by a method of a questionnaire about the self-reflection of teachers at the first grade of primary schools regarding the interaction style. It is aimed on the discrepancies in the interaction style of teachers when they evaluate their real I, their ideal I and when they are evaluated by the others. To find out the interaction style of teachers there was used a Questionnaire of the interaction style of a teacher (Slovak version) which is a suitable tool for the professional self-reflection of teachers. It is possible to administer it to the teachers as well as to their pupils, colleagues, headmasters and parents of their pupils. In the research we carried out, the teachers themselves evaluated their interaction style from the point of view of their real I and also their ideal I. Subsequently, a chosen colleague and the headmaster of the school evaluated the interaction style of these teachers. The results of the implemented research showed that there did not occur any statistically significant differences in the evaluation of the interaction style of teachers by their colleagues, headmasters and by the teachers themselves. We found out that there exists an important difference in the self-evaluation of the interaction style of teachers at the level of evaluating their real I (what teacher I am) and their ideal I (what teacher I would like to be - an ideal teacher). At the end of our article there is a discussion and formulated recommendations in the area of the self-improvement of teachers at the first grade of primary schools.

Keywords: self-reflection of teachers, phases of self-reflection, functions of self-reflection, methods of self-reflection, interaction style, questionnaire of the interaction style of teachers

1 Introduction

In the educational practice there is possible to observe teachers who are not satisfied with their own work, in a positive sense of the word, or they have an impression that many things could be done better and therefore they incessantly reevaluate their work, search for innovations in the literature correcting their further activity in this way. However, we differentiate the *unaware (unintentional) self-reflection* which is spontaneous and the *conscious self-reflection (intentional, purposeful)* which enables to the teacher to know his/her own educational activity and also the possibilities of its innovations more thoroughly. The teacher systematically pays his/her attention to planning, realisation and evaluation of his/her work using manifold self-reflective methods with the aim to remove the existing deficiencies and to improve the quality of his/her work and of the proper educational process as well. When gaining the feedback information, it is important so that the teacher is able to accept also possible critical words as a means of improving his/her own work (Hupková & Petlák, 2004).

The beginnings of using the concept of self-reflection are connected with the name of the American pedagogue and philosopher John Dewey (1933) who defined also several phases of self-reflection. These phases do not have to follow in a strict order but they can overlap and in this way they create the process of reflective thinking: - *proposals of solutions*, - *intellectualization*, - *the leading idea (hypothesis)*, - *reasoning (testing of the hypothesis in the mind)*, - *testing of the hypothesis in acting*. Based on this model, several authors have divided the process of self-reflection in the educational activity into five mutually overlapping phases, e.g. Schön (1983): - *a describing phase*, - *an informing phase*, - *a confronting phase*, - *a reconstructive phase*; Smyth (1989): - *starting of the process of self-reflection*, - *gathering and organising of the reflected pedagogical activity*, - *an analysis and interpretation*, - *creating of the plan of future pedagogical activity*, etc.

The self-reflection is an indispensable measuring of controlling the teacher's activity. It indicates the scope of changes which are reflected in his/her results of work. The meaning of the *purposeful and systematic self-reflection* lies in the fulfilling of these basic tasks: - it avoids routine in the teacher's work because he/she incessantly "evaluates" his/her activity, looks for

new methods, forms of work, etc., - it enables to the teacher to try new methods, to compare them with his/her previous results of work and the results obtained with other methods, - it shows to the teacher how to foresee possible consequences of his/her acting, - it contributes to the informal and systematic self-education, self-formation of the teacher. In the literature the teacher searches for support and reasoning of his/her methods, forms of work, etc. The systematic, professional self-reflection fulfils mainly the *cognitive, feedback, preventive, relaxational, adaptation, motivational, controlling* and, last but not least, the *creative function* (more details in Hupková & Petlák, 2004).

The professional reflection can be aimed on the partial phenomena as well as on the whole complex with the aim to obtain a complete overview about the teaching process and the work of the teacher at the lesson. In order to achieve this aim, the teacher can use several methods which enable and support a purposeful, systematic self-reflection of his/her work. These methods include a *self-reflective dialogue*, a *self-reflective questionnaire*, a *self-reflective pedagogical diary*, *self-reflective taxonomies*, etc.

A very valuable tool or method is a questionnaire method because it can provide to the teacher auto-diagnostic information. Its advantage is that it enables to verify a certain phenomenon collectively and to gather problematically available facts from several people. The questionnaire also allows to find out opinions of pupils, colleagues, parents about the methods and forms of the teacher's work in the educational-formative process. It provides to the teacher a feedback about his/her educational-formative work and its results. A correctly formulated questionnaire represents a mirror which can point out the facts the teacher is not aware of in his/her routine approach. For example, it can be a fast or slow explaining of topics, unilateral methods of work, insufficient usage of illustrative examples at the lesson, strict examining, etc. Gavora (2003) says that a *Questionnaire of the interaction style of teachers* (Gavora, 2003) can also be a suitable tool of the professional self-reflection of teachers because it can be administered to the teachers as well as to their pupils, colleagues, headmasters and parents, providing auto-diagnostic information to the teacher. Using this information, the teacher can reflect about his/her own work and also to verify the success of his/her own pedagogical acting. We will deal with this questionnaire in the following text.

2 Interaction style of teachers

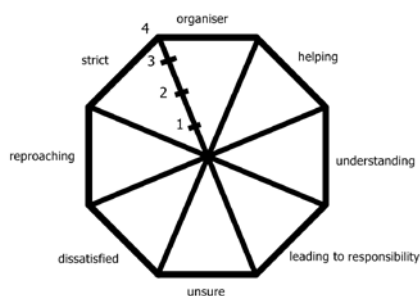
Every teacher inclines to a certain way of interaction which is dominant in different interaction episodes. Regarding to this fact, we can talk about his/her *interaction style*. The interaction style is a relatively stable characteristic feature of the teacher and it represents him/her well. To a certain degree, it helps to his/her pupils to foresee the activity of the teacher and to prepare for it (Gavora, Mareš & Den Brok, 2003).

Based on several definitions and approaches in the specialised literature, Petlák and Fenyvesiová (2009, p. 61) define the interaction style of teachers as "*a relatively stable characteristic feature of the pedagogue which is reflected in his/her personal qualities, didactic skills and pedagogical-psychological characteristics.*"

According to Zelina (1995), the interaction style is reflected mainly in the *structure of didactic activities, in the form of contents of his/her communication with pupils, in the way of leading and controlling their work.*

Sirotová (2000) thinks that the interaction style is influenced by several groups of factors. These are mainly the *social-historical conditions, personal experience and qualities of the teacher* as well as the *qualities and experience of pupils*, their behaviour in the pedagogical situations.

In the specialised literature there it is possible to find out several typologies of the interaction style of the teacher. One of the most famous is the typology which consists of eight dimensions or characteristic features of the teacher's interaction and therefore it can describe the teacher's interaction in the most complex way (see Scheme 1). It is based on the Leary's *model of the interpersonal behaviour* (1957) which was transformed and introduced into the area of education and formation by Dutch pedagogues from the University in Utrecht (Wubbels, Créton & Hooymayers, 1987).



Scheme 1: An example of the typology of the interaction style of the teacher (Gavora, Mareš & Den Brok, 2003)

According to this model, the behaviour of the teacher can be depicted on two intersecting axes whereas the ending points of the vertical axis are the qualities of dominance and submissiveness and on the horizontal axis there are collaboration and refusal. Based on the depicted axes it is possible to observe the dimensions of the interaction style in the octagon: - *the organiser of the lesson* (the teacher teaches with enthusiasm, he/she explains the topics in an interesting way and therefore he/she keeps the attention of his/her pupils. The teacher has an overview of everything what is happening in the class during the lesson), - *helping to pupils* (the teacher tries to help to his/her pupils, he/she is friendly, tolerant and reliable, with a sense of humour and in this way the teacher creates a pleasant atmosphere in the class), - *understanding* (the teacher is patient, he/she accepts the mistakes and deficiencies of his/her pupils. The teacher discusses with the pupils and he/she gives them an opportunity to express themselves), - *leading to responsibility* (a typical feature of this teacher is the possibility he/she gives to the pupils to decide about the issues related to the class, he is liberal and his/her opinion can be influenced with appropriate arguments), - *unsure* (the teacher is shy and hesitant, his/her reactions are confused, unsure and he/she easily loses the control over the situation), - *dissatisfied* (the teacher is often dissatisfied, bad-tempered and impatient. The teacher does not believe to his/her pupils and he/she often punishes them), - *reproaching* (the teacher is usually angry and impatient, he/she easily gets angry and stops controlling himself/herself. The teacher often has arrogant comments about the pupils), - *strict* (the teacher requires unconditional obedience and has very high requirements, he/she is demanding and pupils are afraid of him/her) (Fenyvesiová, 2006).

Because of the self-reflection, the teacher's interaction style can be evaluated by pupils, colleagues, headmasters, parents and also by the teacher himself/herself by means of a questionnaire, observation and other methods. Alternatively, it is possible not to evaluate a particular teacher but to express the qualities of an ideal teacher. We applied a version of the Questionnaire of the interaction style which is based on the American version of this questionnaire - *Questionnaire on Teacher Interaction (QTI)* (Wubbels & Levy, 1993), that was adapted to the Slovak conditions by Gavora, Mareš & Den Brok (2003). Its main principle is the observation and then the subsequent filling in the questionnaire. The diagnostic possibilities of the given questionnaire are quite big because we can obtain information about the teacher's interaction from the point of view of pupils, parents, colleagues, etc. In addition to this we can also compare the conformities and differences between this evaluation and the teacher's self-evaluation. It can be a useful tool for the teacher to

have a realistic view of himself/herself (Gavora, Mareš & Den Brok, 2003).

It is evident that the interaction style of the teacher has also an impact on the learning results of his/her pupils. Fenyvesiová (2006) says that the development of the affective part of the pupil's personality (his/her emotions and motivation) is mainly influenced by the help of the teacher to the pupils and by his/her good organizational skills. On the contrary, a dissatisfied, reproaching and unsure teacher can have a negative influence on the pupil's relationship to the topic and to the teaching subject in general. Therefore the teacher should be aware of the fact that in order to achieve excellent results with his/her pupils, he has to be strict and dominant. However, if the teacher desires to create a pleasant atmosphere in the class and in this way to motivate his/her pupils to study, he/she should be mainly a helping and understanding pedagogue.

The research aim

In the following part of this article we select the results of the research on the self-reflection of the interaction style of teachers. One of the aims of the research was to find out discrepancies in the interaction style of teachers between their own evaluation of their real I, ideal I and the evaluation provided by the others.

Research questions and hypotheses

During the planning of the research the results of local and foreign studies led us to several questions which we formulated in the following way:

RQ₁: Does there exist a statistically significant difference in the perception of the interaction style of teachers from the point of view of teachers themselves and their colleagues?

RQ₂: Does there exist a statistically significant difference in the perception of the interaction style of teachers from the point of view of the teacher himself/herself and his/her leading manager (headmaster of the school, deputy of the headmaster)?

RQ₃: Does there exist a statistically significant difference in the perception of the interaction style of teachers when evaluating his/her own real I (what teacher I am) and the ideal I (what teacher I would like to be - an ideal teacher)?

We aimed our research on the implementation of the given aims and its part was the verification of the formulated hypotheses:

H₁: We suppose that there exists a statistically significant difference in the perception of the interaction style of teachers from the point of view of the teacher himself/herself and his/her colleagues. We assume that the particular teacher evaluates his/her own interaction style more negatively than his/her colleagues.

H₀₁: We suppose that there does not exist a statistically significant difference in the perception of the interaction style of teachers from the point of view of the teacher himself/herself and his/her colleagues. We assume that the particular teacher evaluates his/her interaction style more negatively than his/her colleagues.

H₂: We suppose that there exists a statistically significant difference in the perception of the interaction style of teachers from the point of view of the teacher himself/herself and his/her leading manager (headmaster of the school). We assume that the leading manager evaluates the interaction style of the particular teacher more positively than the teacher himself/herself.

H₀₂: We suppose that there does not exist a statistically significant difference in the perception of the interaction style of teachers from the point of view of the teacher himself/herself and his/her leading manager (headmaster of the school). We assume that the leading manager evaluates the interaction style of the particular teacher more positively than the teacher himself/herself.

H₃: We suppose that there exists a statistically significant difference in the self-evaluation of the interaction style of teachers when evaluating their real I (what teacher I am) and their ideal I (what teacher I would like to be - an ideal teacher). We assume that the evaluation of the ideal I will achieve higher values of the analysed dimensions when compared to the real I.

H₀₃: We suppose that there does not exist a statistically significant difference in the self-evaluation of the interaction style of teachers when evaluating their real I (what teacher I am) and their ideal I (what teacher I would like to be - an ideal teacher). We assume that the evaluation of the ideal I will achieve higher values of the analysed dimensions when compared to the real I.

3 Methods

The research set

The research set was formed by 60 respondents (40 teachers of the first grade of primary school from six primary schools in the region of Turčianské Teplice and 20 headmasters of these schools). In our research the respondents themselves (20 teachers of the first grade of primary school) evaluated their interaction style from the point of view of their real I and their ideal I (see the research methods). Subsequently, the interaction style of every teacher was also evaluated by a randomly chosen colleague (in total 20 teachers) and by the headmaster of the given school (in total 20 headmasters).

The research methods Materials and equipments

Independent variables

Regarding the research aims we chose adequate methods of collecting data. In order to find out the interaction style of teachers we applied the *Questionnaire of the interaction style of a teacher* (Wubbels & Levy, 1993, Slovak version: Gavora, Mareš & Den Brok, 2003). The questionnaire consists of 64 scaled items which enable to judge 8 sectors (dimensions) of the interaction style of a teacher (*organiser, helping, understanding, leading to responsibility, unsure, dissatisfied, reproaching, strict*). In the questionnaire several items deal with each sector and each item consists of five levels expressing the frequency of occurrence of the given behaviour of the teacher from “never” to

“always” (0 - 4).

Dependent variables

In the implemented project the teachers themselves evaluated their interaction style from the point of view of their *real I* and in the second questionnaire they did it from the point of view of their *ideal I*. Their interaction style was also evaluated by *their colleague* in the third questionnaire and by *the headmaster* of the school in the fourth questionnaire. Therefore four questionnaires were related to one teacher, they had the same basis but the tasks in particular items were formulated in a different way. In total, we administered and analysed 80 questionnaires. The assessment of the questionnaires was based on the calculation of the arithmetic mean of each sector/dimension in the questionnaire and this mean was within the range from 0 to 4. The higher was the mean, the more often the teacher behaved in that particular way (according to the evaluators).

4 Results

By verifying the hypothesis H₁ we found out that there does not exist a statistically significant difference in the perception of the interaction style of teachers from the point of view of the teacher himself/herself and from the point of view of his/her colleagues. In the Table 1 there are mentioned descriptive statistic data for comparing the interaction style of teachers from the point of view of the teacher himself/herself and from the point of view of his/her colleagues. There are also stated the results of the t-test when comparing the evaluations of the interaction style by the teacher and by his/her colleagues.

Table 1: Comparing of the interaction style of teachers from the point of view of the teacher and his/her colleagues

		M	Med(x)	SD	t	p
Organiser	Evaluation by a colleague	3,4438	3,5000	0,2765	0,2700	0,7894
	Real evaluation	3,3250	3,2500	0,3019		
Helping	Evaluation by a colleague	3,5438	3,6250	0,3015	-0,4900	0,6294
	Real evaluation	3,5000	3,5000	0,3062		
Understanding	Evaluation by a colleague	3,3625	3,3750	0,3216	0,8200	0,4175
	Real evaluation	3,2688	3,3750	0,3656		
Leading pupils to responsibility	Evaluation by a colleague	3,0125	3,1250	0,4899	0,6400	0,5274
	Real evaluation	2,8250	2,9375	0,5216		
Unsure	Evaluation by a colleague	1,5214	1,5000	0,4823	-0,3100	0,7559
	Real evaluation	1,5571	1,5714	0,5117		
Dissatisfied	Evaluation by a colleague	1,3750	1,3750	0,4292	0,7000	0,4890
	Real evaluation	1,4813	1,5000	0,3875		
Reproaching	Evaluation by a colleague	1,4222	1,4444	0,4350	-0,8600	0,3938
	Real evaluation	1,4667	1,3889	0,3705		
Strict	Evaluation by a colleague	2,3250	2,3750	0,3940	-0,3400	0,7341
	Real evaluation	2,4375	2,5000	0,4045		

Legend: M – mean, Med(x) – median, SD – significant deviation, t – value of the test statistics, p – value of the significance of the test

Based on the values in the Table 1, we can see that there were not found out any significant differences in the mean values of the observed dimensions. Before the implementation of the t-tests there were also carried out tests for confirming the existence of division and the test for constant dispersions (Satterthwaite test) which helped us to choose a relevant t-test. The existence of the division was confirmed with the variables and subsequently it was possible to apply the t-test. Regarding

the test for constant dispersions we chose the t-test of two independent sets with the same dispersion. As it is possible to see in the Table 1, the results of the tests did not confirm a significant statistic difference between the evaluations obtained from colleagues and the teachers.

In the investigation of H₂ we aimed our attention to the evaluation of the interaction style of teachers from the point of

view of the teacher himself/herself and from the point of view of the leading manager (headmaster). In the Table 2 there are mentioned the descriptive statistic data of the compared variables and the results of the t-test from comparing the evaluations of the interaction style of teachers from the point of

view of the teacher himself/herself and from the point of view of the leading manager (headmaster).

Table 2: Comparing of the interaction style of teachers from the point of view of the teacher and the headmaster

		M	Med(x)	SD	t	p
Organiser	Evaluation by the director	3,3500	3,3750	0,2856	0,2700	0,7894
	Real evaluation	3,3250	3,2500	0,3019		
Helping	Evaluation by the director	3,4500	3,3750	0,3427	-0,4900	0,6294
	Real evaluation	3,5000	3,5000	0,3062		
Understanding	Evaluation by the director	3,3563	3,3125	0,3069	0,8200	0,4175
	Real evaluation	3,2688	3,3750	0,3656		
Leading pupils to responsibility	Evaluation by the director	2,9188	2,9375	0,4000	0,6400	0,5274
	Real evaluation	2,8250	2,9375	0,5216		
Unsure	Evaluation by the director	1,5071	1,5714	0,4981	-0,3100	0,7559
	Real evaluation	1,5571	1,5714	0,5117		
Dissatisfied	Evaluation by the director	1,5688	1,5625	0,4045	0,7000	0,4890
	Real evaluation	1,4813	1,5000	0,3875		
Reproaching	Evaluation by the director	1,3611	1,3333	0,4028	-0,8600	0,3938
	Real evaluation	1,4667	1,3889	0,3705		
Strict	Evaluation by the director	2,4000	2,4375	0,2769	-0,3400	0,7341
	Real evaluation	2,4375	2,5000	0,4045		

Legend: M – mean, Med(x) – median, SD – significant deviation, t – value of the test statistics, p – value of the significance of the test

Like in the case of testing H_1 there were carried out tests for verifying the division and constant dispersions. The assumption of the concordance of division was confirmed and subsequently we could apply the t-tests. In the case of *Helping*, *Unsure* and *Strict* there was found out a different dispersion between the compared sets and for these variables there was used the t-test for independent sets with the different dispersion and for the other variables we used the t-test for independent sets with the same dispersion (see Table 2). The analysis of the results of verifying the hypothesis H_2 showed that there does not exist a statistically significant difference in the perception of the interaction style of teachers from the point of view of the teacher himself/herself and from the point of view of his/her leading manager (the headmaster of the school or the deputy of headmaster). Our assumption that the leading manager will evaluate the interaction style of the teacher more positively than the teacher himself/herself, was not confirmed.

A very important task of our work was to verify also the differences in the self-evaluation of the interaction style of teachers from the point of view of their real I (what teacher I am) and their ideal I (what teacher I would like to be). In the Table 3 there are mentioned the descriptive statistic data and results of the t-test when comparing the evaluations of the interaction style

of teachers from the point of view of their real I and ideal I.

Table 3: Comparing of the interaction style of teachers from the evaluations of their ideal I and real I

		M	Med(x)	SD	t	p
Organiser	Evaluation of ideal I	3,7875	3,8750	0,2503	5,2700	0,0001 **
	Evaluation of real I	3,3250	3,2500	0,3019		
Helping	Evaluation of ideal I	3,8188	3,8125	0,1646	4,1000	0,0003 **
	Evaluation of real I	3,5000	3,5000	0,3062		
Understanding	Evaluation of ideal I	3,7750	3,8750	0,2316	5,2300	0,0001 **

	Evaluation of real I	3,2688	3,3750	0,3656		
Leading pupils to responsibility	Evaluation of ideal I	3,1688	3,2500	0,3789	2,3800	0,0222 *
	Evaluation of real I	2,8250	2,9375	0,5216		
Unsure	Evaluation of ideal I	1,1000	1,0000	0,3797	-3,2100	0,0027 **
	Evaluation of real I	1,5571	1,5714	0,5117		
Dissatisfied	Evaluation of ideal I	1,1563	1,1250	0,3241	-2,8800	0,0065 **
	Evaluation of real I	1,4813	1,5000	0,3875		
Reproaching	Evaluation of ideal I	1,0111	1,0000	0,2547	-4,5300	0,0001 **
	Evaluation of real I	1,4667	1,3889	0,3705		
Strict	Evaluation of ideal I	2,4500	2,4375	0,5938	0,0800	0,9384
	Evaluation of real I	2,4375	2,5000	0,4045		

Legend: M – mean, Med(x) – median, SD – significant deviation, t – value of the test statistics, p – value of the significance of the test

* a significant statistic difference between the groups at the level 0,05

** a significant statistic difference between the groups at the level 0,01

Based on the results of the descriptive statistics of particular dimensions of the interaction style of teachers mentioned in the Table 3, we can see that there exist differences in the reached mean values of dimensions when evaluating their ideal I and their real I. Like in the case of testing the previous hypotheses, there were carried out tests for verifying the division and constant dispersions. The assumption of the concordance of division was confirmed and subsequently we could apply the t-tests. In the case of the analysed variables there were not found differences in dispersions and therefore there was used the t-test for independent sets with the same dispersion. The results of the t-test of particular dimensions of the interaction style of teachers from comparing their ideal I and their real I confirmed significant statistic differences in all compared dimensions except the values in the dimension *Strict*. In the dimensions of *Organiser*, *Helping*, *Understanding* there was found a significant statistic difference between the compared groups at the level of importance 0,01. In these dimensions the evaluation of their ideal I achieved higher mean values of analysed dimensions when compared to their real I. A statistically significant difference was also found out in the values of the dimension *Leading pupils to responsibility* at the level of importance 0,05 where the evaluation of their ideal I reached higher mean valued when compared to their real I. In the dimensions *Unsure*, *Dissatisfied* and *Reproaching* it was evident that the evaluation of their real I achieved higher mean values than their ideal I. In all the mentioned dimensions there was confirmed a statistically significant difference at the level of importance 0,01. The analysis of the results H_3 confirmed that there exists a statistically significant difference in the self-evaluation of the interaction style of teachers from the point of view of their real I (what teacher I am) and their ideal I (what teacher I would like to be 0 an ideal teacher).

5 Discussion and conclusion

The results of the implemented research showed that there are not statistically significant differences in the evaluation of the interaction style of teachers by colleagues, headmasters and by the teachers themselves. We found out that in the real evaluation of the teachers were achieved the highest mean values in the sectors of *Organiser*, *Helping* and *Understanding* (in these sectors were the achieved values higher than 3, being the highest value at the level of 4). Surprisingly low values were achieved in the dimensions *Unsure*, *Dissatisfied*, *Reproaching* and *Strict*. Based on these results it is evident that the teachers evaluate themselves as good organisers, helping to pupils in a sufficient way, understanding and leading them to responsibility. On the contrary, it was evident that they are not strict enough at their pupils. There were not shown more significant differences between the real evaluation by the teachers and the evaluation by their colleagues. The colleagues evaluated the teachers also as

good organisers, very understanding and helping teachers who lead their pupils to responsibility. The research showed that the colleagues see them less strict than the teachers see themselves. Higher values were achieved in the evaluation of colleagues in the dimension *Leading pupils to responsibility*. According to their colleagues, the teachers are more consistent in the leading of pupils to responsibility than the teachers evaluated themselves in this dimension. This similar evaluation can be due to the fact that the teachers know each other quite well and therefore they also know their interaction style. Similarly, there were not statistically more significant differences in the perception of the interaction style of the teachers between the real evaluation by the teachers and the evaluation by the headmasters. It is clear that there exists a similar situation between the headmasters and the teachers to the situation between the colleagues and the teachers. Based on these results we can state that the teachers used a self-critical approach in the evaluation of their own interaction style which corresponded also to the evaluation by the headmasters. It is possible to conclude that the headmasters of schools in this research know the interaction styles of their employees in a sufficient way, they know about their qualities and deficiencies and due to this reason there did not occur differences in the evaluation from the point of view of the headmaster and the real evaluation by the teacher. It was proved by the research that the most significant differences in the evaluation of the interaction style of teachers exist between the real evaluation of I and the ideal evaluation of I by the teachers themselves. Besides one dimension (*Strict*) there were significant statistic differences in the evaluation in all the other dimensions. From the point of view of the teachers, an ideal teacher is an excellent organiser who often helps to his/her pupils, he/she is almost always able to understand them. An ideal teacher often leads his/her pupils to responsibility and he/she can be also strict when it is necessary. He/she acts as an unsure, dissatisfied and reproaching teacher only very occasionally. The real evaluation of the teachers has similar characteristic features but particular dimensions do not reach such high values as we can see in the evaluation of their ideal I. It means that, in fact, teachers do not consider themselves to be such excellent organisers. From their point of view they do not often help and understand their pupils nor they lead them to responsibility. Based on the results mentioned above, we assume that the evaluated teachers do not have any "difficulties" caused by the discrepancies in the evaluation of their interaction style at different levels. According to Kulka (1983) if a discrepancy is between the fact what kind of person the teacher is and he/she would like to be, he/she feels threatened and frustrated, feeling anxiety and dissatisfaction. Such unsure, anxious and tense teachers influence the atmosphere in the class negatively and they often see only the problematic behaviour of their pupils. However, in our research the teachers did not act as dissatisfied or unsure teachers. The teachers evaluated themselves rather

positively as good organisers, helping and understanding teachers. In the specialised literature, the positive self-evaluation is considered to be an expression of personal maturity and it represents an important feature that can be seen as a basic sign of a good teacher.

Prospectively we think that it would be necessary to add other research tools and to include more teachers in the investigation of the self-reflection in the interaction style of teachers. When evaluating the results of our research, it is important to stress that the research was carried out on a one-off basis and it was not repeated. The subject research does not take into account the fact that the interaction style of a teacher can change during his/her teaching career. It is also not possible to generalize these findings nor to apply them to all teachers of the first grade of primary school.

A very useful idea for us is to compare the interaction style of teachers from the point of view of teachers and pupils. The Dutch and American research did not show any statistically significant differences in the perception of the interaction style from the point of view of the teachers and their pupils. When comparing the results of the Dutch and American research, it was found out that the Dutch and American teachers have quite similar interpersonal behaviour to their pupils in several aspects. On the other side, the American teachers wanted to be stricter and the Dutch teachers wanted to lead their pupils to bigger responsibility and freedom (Wubbels & Levy, 1991). The results of the research carried out in Slovakia (Gavora, Mareš & Den Brok, 2003) show that pupils consider the evaluated teachers to be quite good organisers who help and understand their pupils quite well, leading them also to responsibility. Rather favourable were also the results in the so called "unfavourable" sectors: uncertainty, dissatisfaction and reproaches were low. It was also

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Primary Paper Section: A

Secondary Paper Section: AM

CHOSEN POSSIBILITIES OF DEVELOPING SOCIAL COMPETENCES OF ADULTS WITH ATTENTION DEFICIT / HYPERACTIVITY DISORDER

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Abstract: All people - children, adults and seniors - are able to develop their personalities. This raises many questions related to the development of social competences of people who have Attention Deficit / Hyperactivity Disorder also in their adulthood. Our target group is formed by adults who need to develop their social competences more intensively due to the consequences of their disorder so that they are able to live in their family, social or work environment in a more optimal and integrated way. Our study presents chosen possibilities of developing social competences of adults with ADHD by means of a training programme that is based on the cognitive-behavioural approach.

Key words: adult with ADHD, training of social competences, training programme, cognitive-behavioural approach;

1 Introduction

Even nowadays there has still been valid the general opinion that hyperactivity is related only to children and therefore it is a problem only in younger or older school age. Many people also think that symptoms of Attention Deficit / Hyperactivity Disorder will "naturally disappear" with maturing of the central nervous system. However, almost half of people with the ADHD syndrome still have this disorder in their adulthood and for this reason they have problems to study, work, entertain themselves, enter into contact, and keep their friendships and partnerships.

We do not have many data about adult individuals who were diagnosed with ADHD. There are usually accessible only the statistics from the psychiatric institutions, anti-alcoholic facilities or prisons. This fact does not contribute to the positive perception of this target group. However, it is important to emphasize here the fact that these statistics describe only such cases of children with the given disorder whose development to the adulthood was going in a wrong and devious way (Žáčková, H., Jucovičová, D., 2017b). At this time we already know that many negative symptoms of the ADHD syndrome can be alleviated or even completely eliminated with purposeful training, practising and applying of several approaches. On the other side, many positive qualities can be developed and used for learning strategies of newer, more acceptable ways of behaviour. For this reason, one of the aims of our article is to point out the fact that this can be carried out by means of our training of social competences that is later specified and described in more details.

2 ADHD in adulthood

ADHD, Attention Deficit/Hyperactivity Disorder, belongs to such disorders whose symptoms change with the course of time. Some people will "lose" this disorder when they grow up but in 35%-60% of individuals these symptoms are still present in their adulthood. Their hyperactivity is ceasing to count (it is rather perceived as a feeling of inner inquietude or subjective need to do something all the time). There still remain problems with attention, concentration, distraction, irritability, impulsiveness (in adults, they can lead to attacks of anger, manifold addictions, irresponsible or unpredictable acting), emotional lability, low frustration tolerance and immaturity. This tumultuousness in behavior is more evident in adults than in children with ADHD. People with the syndrome of hyperactivity also have a higher tendency to behave in antisocial and self-destructive way. ADHD has significantly different forms in adults when compared to children. The hyperactivity in children is usually reflected in incessant physical doing of something, whereas in adults it is more about their hyperactive mind that never sleeps and thinks all the time. This kind of mind is making people feel exhausted, causing them also many other smaller or bigger

problems (Pugnerová, M., Kvintová, J., 2016; Paclt, I. a kol., 2013; Paclt, I., 2002; Masopust, J., Mohr, P., Anders, M., 2014).

Despite their excellent cognitive abilities, this attention disorder can be the reason of unfinished study and lower financial evaluation of adults with ADHD, and therefore many of them feel ashamed and socially disadvantaged. In this target group we can also meet with problems of self-presentation and self-confidence. They are at higher risk of having a distorted relationship between a parent and a child, and for this reason their children have more psychopathological problems than their peers. Adult individuals with ADHD create and form functional compensation mechanisms such as practising sport or choosing an action type of job, writing a diary, or they try manifold meditation techniques. Unfortunately, these mechanisms can be dysfunctional as well. Postponing unpleasant tasks to later time or taking drugs to alleviate symptoms of their disorder can be included into this type of mechanisms (Masopust, J., Mohr, P., Anders, M., 2014).

When talking about their work relationships and obligations, hyperactive people are often perceived as "irresponsible" ones because they tend to leave their work unfinished, they come to work late, they do not meet deadlines, they forget important facts, and they do not respect authority of their bosses or used work strategies. Their work abilities are reduced and they have lower working potential. They prefer independent work. Since they are not able to satisfy their needs, they often burn out or change jobs. On the other side, these hyperactive people can be very hard-working and they often become workaholics. Their high working speed can be inconvenient for their colleagues and this fact does not contribute to their good and positive relationships at work. Adults with Attention Deficit/Hyperactivity disorder can make friends easily, but they have a reduced ability to keep these relationships. Their impulsiveness, emotional lability or changes in mood are very often the reason for impulsive breaking up of their friendships. This difficulty to maintain longer relationships is later also manifested in their partnerships. Some personal characteristic features of hyperactive individuals put the stability of their relationships at risk (Žáčková, H., Jucovičová, D., 2017a)

The diagnostic and statistical manual of psychological disorders DSM-5 from the year 2013 brought some changes in the diagnostics of ADHD in the adulthood (in individuals above the age of 17). This manual does not define the subtypes of this disorder like DSM-4, but it describes the forms of ADHD. This approach is better in observing the occurrence of specific symptoms and their changes during particular developmental periods. Based on the number of symptoms, the manual differentiates a light, medium and difficult form of ADHD in its three forms:

1. Combined form (ADHD – C)
2. Form with the prevalence of hyperactivity and impulsiveness (ADHD – HI)
3. Form with the prevalence of attention deficit (ADHD – I or ADD) (Kvašná, L., 2015).

ADHD (Attention-Deficit/Hyperactivity Disorder) - the abbreviation denoting the equivalent of hyperkinetic disorder in MKCH 10, is commonly used in our context as well. DSM-5 divides 18 symptoms into two main groups - attention deficit and hyperactivity/impulsiveness. A very significant change can be seen in the age criterion of the occurrence of these symptoms. In DSM-IV the starting point was set before the child is seven years old, but in DSM-5 it is before the twelfth year of life. There is specified the need for the presence of six or more symptoms out of nine defined symptoms in order to confirm the diagnosis. For adults aged 17+ only five symptoms are required. This disorder can be diagnosed in the adulthood as well. The codes for specification enable to code the combined disorder, disorder with

the prevalent attention deficit and disorder with the predominant hyperactivity/impulsiveness. In case there was diagnosed ADHD in the past and currently there still remain some symptoms leading to distortions in functioning, but the diagnostic criteria are not fulfilled, we code the specification of "partial remission". (<http://www.tdahytu.es/manual-para-diagnosticar-el-tdah-dsm-5/>; Pečeňák, J., 2014).

Diagnostic criteria of ADHD according to DSM 5:

A. A persistent pattern of INATTENTION (1) and/or HYPERACTIVITY-IMPULSIVITY(2) that interferes with functioning or development. Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities: *Note:* The symptoms are not solely a manifestation of oppositional behaviour, defiance, hostility, or failure to understand tasks or instructions. For older adolescents and adults (age 17 and older), at least five symptoms are required.

1. Inattention

- a) Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g., overlooks or misses details, work is inaccurate).
- b) Often has difficulty sustaining attention in tasks or play activities (e.g., has difficulty remaining focused during lectures, conversations, or lengthy reading).
- c) Often does not seem to listen when spoken to directly (e.g., mind seems elsewhere, even in the absence of any obvious distraction).
- d) Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked).
- e) Often has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines).
- f) Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers).
- g) Often loses things necessary for tasks or activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).
- h) Is often easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts).
- i) Is often forgetful in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments).

2. Hyperactivity and impulsivity

- a) Often fidgets with or taps hands or feet or squirms in seat.
- b) Often leaves seat in situations when remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place).
- c) Often runs about or climbs in situations where it is inappropriate. (*Note:* In adolescents or adults, may be limited to feeling restless.)
- d) Often unable to play or engage in leisure activities quietly.
- e) Is often "on the go," acting as if "driven by a motor" (e.g., is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with).
- f) Often talks excessively.
- g) Often blurts out an answer before a question has been completed (e.g., completes people's sentences; cannot wait for turn in conversation).
- h) Often has difficulty waiting his or her turn (e.g., while waiting in line).
- i) Often interrupts or intrudes on others (e.g., butts into conversations, games, or activities; may start using other people's things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing).

B. Several inattentive or hyperactive-impulsive symptoms were present prior to age 12 years.

C. Several inattentive or hyperactive-impulsive symptoms are present in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities).

D. There is clear evidence that the symptoms interfere with, or reduce the quality of, social, academic, or occupational functioning.

E. The symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication or withdrawal). (Masopust, J., Mohr, P., Anders, M., 2014).

In the course of the last 25 years the research has been aimed at the study of social competences of individuals diagnosed with Attention Deficit/Hyperactivity Disorder. Experts found out differences at the level of social competences in particular forms of ADHD that are mentioned above. Adults with ADHD-C show their negative and positive emotions in more intensive ways, they are more competitive and therefore they want to be evaluated as the best ones. They also desire to receive positive evaluation and feedback. On the contrary, individuals with ADHD-I are more passive, shy, their social inclusion is problematic and therefore they are often at the periphery of the social group. People evaluate them less positively, but they are also less actively rejected when compared to the first form of ADHD. However, in all three forms of this diagnosis our target group has the biggest problems with the social adaptation. The research dealing with describing social competences of people with ADHD divides these problems into four areas: *socio-cognitive deficit* (overestimation of oneself, absence of adequate self-perception, desire to be in the centre of attention and to be above the group), *limited social communication* (it seems to be problematic in relation to the environment), *limited emotional regulation* (reduced emotional competences: comprehension, expression and regulation of emotions, a lower level of understanding social situations), and *deficit of behavioural expressions* in social interactions (more chaotic, negative and unstable ways of behaviour in relationships, reduced ability to identify and accept the rules, destructive and negative attitudes) (Kvašná, L., 2015).

3 Emotional disorders and additional disorders in behaviour

People with ADHD suffer from distortions in the emotional area and their display belongs to the most serious symptoms of this disorder because they significantly influence their quality of life and, at the same time they can contribute or be the reason of failures in their interpersonal relationships. Therefore it is important for the given target group to participate in manifold trainings focused on the development of their social skills and competences.

In their childhood and also adulthood we can observe weakened emotional areas and our training could be effective for their development and also for the elimination of unsuitable ways of behaviour resulting from these deficit. We describe our training in the following part of our article. We deal mainly with these additional disorders: *emotional lability* (changes in mood), *increased affectivity* (strong emotional reactions of verbal and physical character), *low frustration tolerance* (inadequate reactions to weak impulses), *unrealistic self-perception and decreased self-confidence* (they are not self-confident, they underestimate themselves and compensate these feelings with attracting attention of other people), *lowered or weakened ability of empathy, increased egocentrism, weakened auto-regulation, neurotic expressions* (Žáčková, H., Jucovičová, D., 2017a; Žáčková, H., Jucovičová, D., 2014). Therefore the above mentioned problems are not related only to the period of childhood, but they influence the quality of life of adults with ADHD and their behaviour in family, partnerships, friendships and work relationships. It is not possible to eliminate the symptoms of the given syndrome completely, but these people need to learn how to live and cope with this syndrome.

However, it is possible to influence many symptoms accompanying ADHD by means of therapeutic guiding focused on self-knowing and solving or eliminating of mainly negative impacts on everyday life, or by means of training of social competences that is a subject of our article. Our training can be part of the therapeutic guiding where the clients are lead to the understanding of themselves, their own behaviour, reactions and their gradual controlling. In addition to learning how to control themselves and create a system in their life, they also learn to understand interpersonal relationships, they improve their ability of empathy, general social communication, and orientation in social situations, etc. They also acquire better skills in planning, time management, finishing of their tasks, and they learn to be responsible for their work and decisions. Furthermore, they learn to make use of the so called compensation mechanisms as well (Žáčková, H., Jucovičová, D., 2017a).

There are many therapeutic approaches and the most effective one seems to be the cognitive-behavioural therapy (KBT). For this reason we focus on this approach in our article. On its basis we created also our training programme with the aim to develop mainly the social competences of adult people with ADHD. The basis of the mentioned type of therapy is practising adequate behaviour and oppression (alleviation or elimination) of the negative behaviour. By means of manifold techniques such as modelling of situations, role playing, self-instruction (hyperactive people control their reactions of impulsiveness, distraction or increased emotionality) the target group learns the way of adaptive behaviour. The training of social competences seems to be very effective in forming our emotions. The inability to understand, name, process or guide the emotional experience of target group does not have to be related to wrong or problematic education but to the weakening and differences in the central nervous system.

The level of emotional experiencing can be depicted with the following pyramid:



(Žáčková, H., Jucovičová, D., 2017a).

In order to reach the stability of the pyramid it is necessary so that its particular levels are stable, including the lowest levels. We often meet with the fact that people with ADHD begin and finish at the first level - at the level of *OVERLOADING* with emotions, and therefore they are not able to handle and control their behaviour. In general, they have a tendency to be affective or to have strong and sudden emotional reactions of inadequate intensity. Their outburst is very fast and their course is very tumultuous. Overloading with emotions is a normal phenomenon but it is important not to stay in this stage, but to rise up to the top of the pyramid. This process is possible also by means of our training which helps people with ADHD to be aware of their own feelings, to name and describe their emotions, to be able to control them, and to show their empathy to other people in their surroundings (Žáčková, H., Jucovičová, D., 2014).

4 Developing social competences of adults with ADHD by means of a training programme

Currently the development of social competences has been at the centre of attention of many areas of social practice. Programmes aimed at developing social competences have become a part of lifelong education and psycho-therapeutic procedures. We understand training of social competences as a practical activity

which support the process of (social and cognitive) learning based on interpersonal experience and emotional feelings. Its basic principle is the purposeful and organised development of social behaviour. The training is based on developing personal qualities of individuals, their social competences in the area of interpersonal perception, sensitivity, emotional self-expression, verbal and non-verbal communication, cooperation, assertiveness, effective solving of conflicts, auto-regulation of behavior, responsibility, etc.

The training of social competences can be carried out in the individual or group form. The individual form allows us to concentrate on the specific problems of the participant. This way is preferred when we work with a person with ADHD (and its health condition influenced with the given disorder requires it) or with a person who has problems with joining a group (Wilkinson, Canterová, 1982).

However, the group form has several advantages. The group creates a social situation which is already "a real situation". There are different types of people and this is a positive aspect in role playing and providing feedback. Members of the group represent different models and they can help others to realise that the model of the coach is not the only one 'correct' there. This form of learning is more effective when the models have features more similar to the observer / participant of the training (Bandura, Grusec, Menlove, 1967, in: Wilkinson, Canterová, 1982).

Though there are several reasons for having a group form of training, it could be more suitable for some types of clients to start with the individual form. These individual sessions take place simultaneously with the group training. In the practice the choice of the right form of training depends on the given situation and specific needs of clients. In both cases these training sessions should be beneficial mainly for the client (Wilkinson, Canterová, 1982)

The model of this group form of social training for adults with ADHD has a structured character and it is based on the cognitive behavioural approach (Lieberman, Derisi, Muesser, 1989, Praško, Možný, Šlepecký et al., 2007, Wilkinson, Canterová, 1982 etc.). We also applied there our own longtime experience from carrying out trainings of social competences in different target groups.

The cognitive behavioural approach (see also Praško, Možný, Šlepecký et al., 2007) is based on the theory that the cause of psychological difficulties is found in wrong ways of thinking and behaving which are taught and kept by outer and inner factors. People are able to get rid of or re-learn these wrong ways of behaving, or they can learn newer, more suitable ways of behaviour which will enable them to adapt themselves to new situations more effectively and to solve their problems. Over the course of several decades, many behavioural methods have arisen (e.g. methods of creating new behaviour, methods of changing the existing behaviour - operational conditioning, etc.) as well as cognitive methods (e.g. cognitive re-structuralisation, self-briefing, etc.). They have a wide application not only in the therapeutic approach to the treatment of mental disorders but also some of them have been applied to the training of social competences and developing of social competences of the wider population. Social training as a model social situation is based on the assumption that there exists the process of cognitive and social learning in every group interaction. After completing the training, the acquired social competences and components of social behaviour can be applied to real life by means of transferring them from the model situation.

The aim of our designed training is to increase the social competence of adults with ADHD by means of developing social competences in the area of knowing themselves and others and in self-effectiveness (*the first part of the programme*), in the area of interpersonal communication and self-confidence (*the second part*). It can also help them to understand their emotions (*the third part*), to solve conflicts and to cope with difficult situations

(the fourth part) and to be more creative (the fifth part). Individual parts of the programme are mutually independent.

We recommend to carry out trainings in a form of small homogenous groups (according to the type and degree of disability). Each part requires 10 sessions. The sessions should be regular, taking place once a week. The length of these meetings depends on the health condition of the participants as well as on the specific needs resulting from ADHD. If it is possible, we recommend 60 minute sessions.

The traditional group session is divided into six parts. They can be adapted to the specific needs of the given group (Wilkinson, Canterová, 1982, adapted by Hupková, 2010):

1. Warming up the group

After arriving, members of the group get acquainted with the new situation, establishing a feeling of safety and certainty within the group. Help them to understand any new conditions and start relaxing the group by means of some warm-up exercises. You can use the warm-up exercises as an introductory part of the training programme and a complement to other activities as well. Particular types of warm-up exercises can be created in order to practise different aspects of behaviour, which are trained during the sessions but are not related to specific situations, such as compared to role-play.

2. Instruction

Every session should be based on a certain topic (social competence) which can be related to nonverbal or verbal behaviour. The first step of training social competences to be achieved is letting the participants feel the need or desire to acquire the given social competence and understand its benefit. The task of the coach is to describe the given behaviour in detail and to explain its importance. The coach will explain to the participants why it is necessary to use this competence in the social interaction, what advantages are connected with its acquisition, and disadvantages we may meet if we do not know or do not use these expressions of behaviour. It is possible to create the need or desire to acquire social competences by means of a dialogue or discussion about the advantages of using them, or by using a film or video recording. It is very important that the coach gives clear and understandable instructions presented on basis of examples which should be similar to the situations the participants experience and should be expressed in a language which the participants understand without any problem and make sense to them. The instructions are not only given to inform participants about the social behaviour, but should also provide the basis for any subsequent training and role-play. The participants should be aware of what they are supposed to do during the role-play before taking part in them.

3. Modelling

The essence of modelling is the performance of a social competence by means of a living or symbolic model. It is subsequently followed by specific training of the given social competence. The training of the social competence starts in such a way that two volunteers are asked to perform the usage of the given social competence. Feedback is very important in this step. In this way useful information can be provided to the participants about their behaviour, what they are doing correct or incorrect, and what they lack the most so that they can improve and correct their behaviour. After practising there should follow a discussion where we can analyse their behaviour, look for the best ways for using the social competence, or some alternative options. Modelling and practising the behaviour of participants necessarily needs guiding and controlling by the coach of the training, mainly by means of verbal instruction and feedback on social learning.

4. Role-playing

The main component of training social competences is the training of behaving. After the instructions and performed behaviour (competence), participants play out short scenes which simulate real situations from their lives. The task of the coach is mainly to deal with the preparation of a suitable

environment for role-playing. When everything is ready, the coach should explain to the other participants which type of specific behaviour will be practised. In this way, the participants can concentrate better on the practised behaviour during the scene, and provide feedback later.

5. Strengthening

When all participants have received information about a certain social competence by means of instructions and models and they have practised the given behaviour, their skills will be improved on the basis of strengthening. Strengthening can take the form of positive or negative feedback which will provide participants with information about their behaviour and reward (appraisal), or we can use another form of evaluating. The coach and other members of the group can provide feedback. If the feedback is provided by the participants of the training group, the coach should prepare them in advance to be positive so that their feedback is helpful for all the group. The process of providing feedback can have a significantly positive influence. It provides an opportunity to practise direct communication with others and it helps other members of the group to concentrate on the shared activity. It unifies them and also increases the possibility of learning to observe the behaviour that they were just learning. Concerning rewards, we can use verbal rewards (praise and encouragement) or non-verbal rewards (nodding in agreement, a tap on the back, some applause) or we can use other forms of reward (stars as rewards, etc.). The systematic use of feedback and rewards can shape the individual in the correct way and it increases the probability of repeated occurrence.

6. Giving homework

By means of training, participants will have acquired social competences in the model situations. Therefore it is important so that they apply them in real life. Giving homework provides an opportunity to try newly acquired ways of behaviour in real situations and in this way they can transform the competences acquired during the training sessions into their own environment. It is useful to write down the setting of homework on paper or in an exercise book. We can ask the participants to record their performance and take notes of everything what was happening during the practise, and their success, feelings and difficulties with which they had to cope. Taking a note of homework enables them to monitor their own behaviour and also provides useful information to the coach who can subsequently give feedback to the participants in future sessions. Noting homework together with subsequent feedback can be a very powerful tool for improving behaviour.

The constellation of the group session can change according to the situational and individual needs of participants. The particular tasks, activities and breaks are included in the training, work according to the preceding analysis of the group situation, depending on the needs of the participants and the current symptomatology in our target group.

When creating the aforementioned programme, we applied several principles which are based on the principles of working with individuals with special needs and people with Attention Deficit/Hyperactivity Disorder belong to them (Jesenský 2000, modified by Jedličková, 2014, Müller de Morais, Jedličková, 2015). It is also necessary to respect these principles in the subsequent application of the programme in our target group.

1. *Principle of purposeful proceeding and performing:* it is important to consider all interventions and components which form the educational process. We must not forget about personal interests, motivation or participation of people with ADHD in solving the given task. Intentionally established situations must be guided and completed by spontaneously acted means.

2. *Principle of well-being, rationality, emotionality, adequateness and prevention against stress:* we must avoid overly high requirements and stress during the educational intervention. Activities should become gradually more complicated. It is also necessary to alternate work with relaxation and to establish a positive atmosphere. Educational

actuation should represent prevention against undesirable phenomena, mainly the arising and development of defectiveness.

3. *Principle of respecting the needs of disabled people, plurality and comprehensiveness of the educational actuation:* it is based on the fact that adults with specific educational needs already have a formed personality. They usually know or feel what they need and it is important to respect that.

4. *Principle of activity and independence:* represents the abilities and states where disabled people usually have a low performance score. It is connected with underestimation and depressive states resulting from an inability to accept their disability or distortion. It is possible to overcome these states and avoid the defectiveness with the help of suitable means.

5. *Principle of applying re-educational and compensative methods, technical conditions and marketing of educational services:* this is an adaptation and modification of conditions of education regarding the type and degree of disability and the use of compensation and rehabilitation aids.

6. *Principle of dominance and complementarity of tasks, means and institutionalisation:* During the educational intervention (depending on its character and tasks) different approaches, means and forms can be used. Some components will have a dominant position and this dominance influences the effectiveness of the chosen means. An important task of the coach of the training programme is to determine and regulate this dominance.

7. *Principle of integration, partnership, support and solidarity:* the basis of this principle is to support the integration of disabled people into a society of people without disabilities or similarly disabled people. It can help them to get rid of isolation, segregation and defectiveness.

8. *Principle of humanity and respect of human dignity of disabled people.*

9. *Principle of union of educational, rehabilitative and social actuation:* the education of adults with ADHD should be related to their rehabilitation or social intervention. Therefore the differences between the educational, rehabilitative and social actuation should not be big, but instead complement each other. Competent specialists should be able to cooperate mutually and coordinate their actuation in favour of supporting the personal development of disabled people.

10. *Principle of subsidiarity and participation:* this is a requirement to approach the educational actuation in ways that can be carried out wherever disabled people live. At the same time, this principle requires some adjustment of local conditions and adequate schooling of people who are in daily contact with disabled people.

The effectiveness and success of educational-rehabilitative programmes is influenced more by the psychosocial components than any existing disability or illness. In the target group of adults with ADHD, often we see apathy and resignation present, as well as a decrease of performance conditioned by the organic changes of the brain which reduce and complicate the effectiveness of the educational-rehabilitative actuation. However, it is possible to overcome this. We can achieve this by means of determining small and easily accessible aims. This way is the basis of activities with disabled seniors. The steady results form the most important motivation in the area of education, activation and rehabilitation of disabled adults and seniors (Vítková, 2006).

The coach of the training programme is supposed to be sensitive, empathic, tactful and tolerant of the target group. At the same time the coach should try to have a positive and balanced attitude to seniors and be willing to help them to achieve any personal aims and solve any problems and difficulties.

5 Conclusion

Trainings aimed at a purposeful development of social competences have a very important position in the system of lifelong education. We are of the opinion that these trainings should become a part of the work with adults with different kinds of disorders or disability. It is necessary to develop more adaptable social competences of people with Attention Deficit/Hyperactivity Disorder in order to improve their quality of life and minimise the negative impact of their disorder. The ability to cope with a wide range of social situations in an effective way can provide a certain protection against stressful life events, tensions and conflicts. A social training can be an optimal intervention in this type of situations. Socially competent and self-confident people play an active role in their life, expressing their requirements in a suitable way and they achieve their aims. Trainings of social competences can support the development and cultivation of personality with ADHD and we can see positive results in social interactions, communication, adequate self-confidence, self-realization, and in solving of conflicts and problems with adaptation, etc. (Lieberman, Derisi, Muesser, 1989, Praško, Možný, Šlepecký et al, 2007, Wilkinson and Canter, 2005).

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Primary Paper Section: A**Secondary Paper Section: AM**

NARRATOR AUTHENTICITY PROBLEM IN ENGLISH PROSE BY V.V. NABOKOV

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Abstract: This article attempts to study narrative strategies of V. Nabokov's English prose. This issue was previously addressed by J.W. Connolly, P. Tammi, G. Shapiro, who tried to come up with explanations for this phenomenon. This work exploits existing conceptual leads to analysis of specifics of the narrative in Nabokov's texts. The author reviews "The Real Life of Sebastian Knight", "Pnin", "Lolita", "The Original of Laura" novels. We established that author's strategy is growing more complicated: from building fictitious narrators as portrayers of author's masks within quasiepic narration pattern, often taking exaggerated and grotesquely attenuated forms, the prose writer moves on to manipulations with narrators' authenticity, showing their gradual self-obliteration. We have proved that the goal behind narrative strategy of Nabokov's English prose is resolution of a self-identification problem.

Keywords: V. Nabokov, narrator, author's mask, narrative strategy.

1 Introduction

The twentieth century was seeing a growing complexity of relationships between creators and reality depicted by them. Narrative techniques of prose, both Russian and Western, feature rather narrative play with several participating storytellers, rather than immovable and solid nature of epic omniscience of the author-narrator. Such techniques employ varying speech positions, shifting and relocating horizons of the author and the protagonist (Kozhevnikova, 1985; Shepherd, 1992; Schmid, 2003). This entails a wide presence of fictitious authors in texts, distinctly expressed narrative inversions and a multitude of narrative strategies. V. Nabokov's English prose seems most remarkable in this respect, where we see the narrative gaining not only aesthetic, but ontological status as well: the writer, while breaking an illusion of fine art, corroborates its independent existence through denial. By exposing technical tricks, he emphasizes integrity of the ideal aspect of fine art and brings together reality and imagination. Starting from "The Real Life of Sebastian Knight" and "Pnin" all the way to "Lolita" and "The Original of Laura", all English novels by V. Nabokov expose a very keen interest of the novelist to the narration process itself and to various narrative forms (Connolly, 1992; Tammi, 1985; Shapiro, 2001), as well as to the "personality" of the story teller.

2 Methods

Principles of Russian comparative-historical literary studies put forth in works of M. Bakhtin, V. Vinogradov, B. Uspensky (Bakhtin, 1976; Vinogradov, 2005; Uspensky, 2000) are assumed as fundamentals of the research methods used herein. We also applied typological method that allows for revealing narrator's typical patterns as part of Nabokov's authorship strategy. Where Nabokov's English prose is viewed as reflection and introspection of his personal life experience, the writer also uses biographical method; in particular, protagonists of his novels are seen as his literary masks (Osmukhina, 2014). Other methods include elements of narrative analysis (Tammi, 1985; Schmid, 2003), since, as we will note further, narrative strategy is considered one of the subjects of our research as well as the method for comprehensive analysis of literary writing, which looks at literary text as a system of mutually linked elements.

3 Results and Discussions

When one contemplates about narrator authenticity problem and even wider – a problem of mimicry of writer – in Nabokov's writing, there is a quite remarkable phrase belonging to the writer himself: in preface to Stanley Kubrick's "Lolita" he ironically referred to himself as "the placid profile of a stand-in for Hitchcock" (Appel, 1974). A reference to Hitchcock is totally not accidental, since "presence" of a major movie director of the 20th century in his cinematographical works is quite comparable

to "residence" of a major Russian-American prose-writer in his own novels, which apparently was the feeling of Nabokov himself. That said, the prose writer was most probably making allegations not so much to actual episodic appearances of Hitchcock in any of his "major" works, but to his experimental title sequence to 1955 "Alfred Hitchcock Presents" TV show, where a simple line-drawing caricature of Hitchcock's profile was first made and then his silhouette walked to center to eclipse the profile. But literary text space, unlike cinematographical text space, features a greater scope for experiments with representation of the author-creator: all the way from auto-coding techniques, including anagrammatic play, up to revelation of the author under masks of characters, storytellers, narrators, often burlesque and exaggerated. But Hitchcock never concealed but always revealed himself, showing up in supporting cast either as a bystander or as a rubbernecker (in TV show that we already mentioned, he appeared as a cynical storyteller, furnishing sarcastic comments at beginning and end of every episode and thus expanding author's influence) (Tryuffo, 1996). On the contrary, Nabokov was quite controversially playing with the idea of "carving out" the character of the author and identifying the "real" author against his writings. He has emphasized a relative nature of this idea throughout his writing career – from earlier stories and "Mashenka (Mary)" to "Lolita", "Ada" and fragments of "The Original of Laura" novel.

Unlike Sirin the writer, after Nabokov moved to the US in 1940, he did not change his narrative strategy of "breeding" his counterparts, of dissolving the author's ego in the play of narrators, storytellers and characters (Osmukhina, 2009; Osmukhina, 2014; Shapiro, 2001), continuing to move towards expansion of such strategy. Nabokov's novels retain a unique feature – an image of a meditating character, endowed with not just nostalgic reminiscences but with an ability to submerge into imaginary worlds and, as a consequence – a dual world in aesthetic (world of art in an opposition to the reality), gnoseological (character's perception of reality as a dream and dream as a reality) and existential aspects (majority of protagonists lead "dual" existence). Practically all English works of Nabokov use intertextual techniques, parodies, self parodies, author's mask: the "real" author, the one behind the text, consistently arrives at the character – "the other one", tries on various masks, by demonstrating hidden play on autobiographism, aesthetical and intentional mingling of the author's voice with the voice of the narrator. All of the above builds up mystery around the reader of self-parody forewords, self-comments and self-allusions.

Same as in Russian, the author-narrator-character triad in his English works is expanded by creating an intricate system of masks the author is wearing. However, now it is not only the "real" author who transforms into characters and narrators, but also many narrators impersonate the "true" author by means of a mask. It is the masks that do not just destroy the illusion of verisimilitude, but overdrive the artificiality, fictional nature of both the world created and the authentic author's image invariably manifested therein. Almost for fifteen years, Nabokov was at the periphery of US literary life, mostly teaching, but even in his Lectures on Literature he used to draw attention of the audience to different forms of author's mimicry within one or another literary text. Contemplating on the character of the Man in the Brown Macintosh in Joyce's Ulysses, Nabokov emphasized: "Do we know who he is? I think we do. The clue comes in Chapter 4 of part two, the scene at the library. Stephen is discussing Shakespeare and affirms that Shakespeare himself is present in his, Shakespeare's works. "He has hidden his own name, a fair name, William, in the plays, a super here, a clown there, [...] and this is exactly what Joyce has done – setting his face in a dark corner of this canvas. The Man in the Brown Macintosh who passes through the dream of the book is no other than the author himself" (Nabokov, 1998).

The "Real Life of Sebastian Knight" is the first English novel, where topics of transfiguration are manipulated at different levels and the writer develops quite an intricate narrative model by intermingling masks of the author-narrator and a character. The author grants autobiographical traits to the main character. Sebastian's studies at Cambridge ("he disliked a lot at Cambridge" (Nabokov, 1991)), detailed description of the character's life at the university correspond to Nabokov's actual biography, who attended the same Trinity College. Sebastian also inherits from Nabokov his juvenile affection to three leading English poets from 1890-1910 – R. Kipling, R. Brooke and A.E. Housman: "I had my Kipling moods and my Rupert Brooke moods, and my Housman moods" (Nabokov, 1991). Apart from that, F. C. Burnand's collection of short novels and satires "Occasional Happy Thoughts: About Buying a Horse", W. Caine's novel "The Author of Trixie" in the Knight's list belong to "inferior", joking literary genres that have a lot of significance in poetry of both Sebastian and Nabokov himself. Recurrent comparisons of artwork with performance, tricks, clownery throughout the novel, or Knight's assertion that harmony for him is in combination of a picture in *Punch* and a purple passage in *Hamlet* may be associated with a problem of creating something like a clownish mask of the narrator, which was so important for Nabokov.

Same as Nabokov, Sebastian Knight feels an outcast and transforms his sorrow for "paradise lost" into a source for creative activity: as Nabokov laments his childhood and adolescence left behind in Russia in his "Other Shores", Knight's overwhelming sorrow is reflected in his autobiographic work "Lost Property": "I always think that one of the purest emotions is that of the banished man pining after the land of his birth. I would have liked to show him straining his memory to the utmost in a continuous effort to keep alive and bright the vision of his past" (Nabokov, 1991). Both the author and the character escaped Russia in rejection of "gruesome" communist regime.

Intentionally confusing the reader, the "real" author, as part of his subjective narrative, figuratively speaking, raises the extent of his "remoteness" from created reality and characters to the square: the narrative is carried by Sebastian Knight's half-brother, whose fate interlaces with the pattern of his character's fate, whereas Sebastian's search for his own self leads not only to revelation that his novel corresponds to reality of V., but to loss and then "discovery" of his own identity. The "author" is gradually being bonded to his "character", clearly realizing unmatchedness to his own self and in finale – we see his fusion not only with Sebastian, but with some "third party", which is illustrated by anagrammatic play of names of the narrator-character: "I am Sebastian Knight. I feel as I were impersonating him on a lighted stage, with the people he knew coming and going... They move round Sebastian—round me who am acting Sebastian. [...] And then the masquerade draws to a close. [...] They all go back to their everyday life [...] but the hero remains, for, try as I may, I cannot get out of my part: Sebastian's mask clings to my face, the likeness will not be washed off. Try as I may, I cannot get out of my part [...] Sebastian's mask clings to my face, the likeness will not be washed off. I am Sebastian, or Sebastian is I, or perhaps we both are someone whom neither of us knows" (Nabokov, 1991). Dropping well-known explanations into the name of the main character – Sebastian Knight, covering Shakespeare and chess based allusions; we shall only note one thing: according to English pronunciation rules, the first letter in the name of the main character Knight is mute, thus deriving an initial "N". Thus, narrator V. is writing a biography of writer N. and, consequently, when narrator and character merge into someone called V.N. in finale, who possesses an "outlook" of his own, that of a narrator and that of a character combined.

In "Lolita" the connection between the "real" author and the image of Humbert, the narrator-character is not quite so definitive, as psychoanalytically oriented literary scholars believe (Proffer, 2000). But the fact that Lolita's tradition itself is quite established in Nabokov's mind and works way deeper than the author would like to acknowledge it (and it is not just

"The Enchanter", or a dirty little story of Schegolev in "The Gift", but also pretty transparent allusions to the topic of lolitas in "The Original of Laura"). With all seeming authenticity of the main character – narrator, as surprising as it may be, Nabokov himself points to the artificial nature of the main character, as part of unrealistic, "made" world in the narration: reading the "Who is Who on Stage" guide (Nabokov, 1999), the main character finds references therein not only to Clare Quilty and Lolita, but to Vivian Damor-Block, an anagrammatical mask of the "real" author, self revealing and again coming forward like W. Thackeray as the puppet master in "Vanity Fair". We will also note that given well known Nabokov's unacceptance of Freudism and his more than skeptical attitude towards various psychological perspectives, the appearance of yet another narrator, doctor Ray, in foreword to the novel seems very justifiable – fictitious narrator represents an author's mask, which the "real" author hides behind and mocks ponderings and diagnoses of psychoanalysts. Apart from that, Ray the narrator becomes a means for the "real" author to once and for all distance himself from a chance of being identified as the main character of the book, as apparently was foreseen by the writer.

Complication of the narration with plenty of masks can also be found in "Pnin" novel, which, basically, becomes a statement of informal progress review and closing books not only on university activities (in 1941 Nabokov was a professor at Wellesley, then in Cornell), but on American life in general. While maintaining neutral-ironic third person narrative manner, the last chapters of the novel are written by Vladimir Vladimirovich, one of the characters of the novel. A "fascinating lecturer", a Russian writer who moved to the US in the 1940-ies, passionate about entomology, a prose writer who is quite popular among the expatriates with a reasonably well established career, who exchanges correspondence with "a famous emigrant writer Sirin" and who happens to be a complete namesake of the "real" author on top of that. The image of the "real" author in the novel is flaking: apart from biographical counterpart of Vladimir Nabokov, here we can see a parody mask of professor Pnin, featuring quite a number of autobiographical traits. Moreover, description of Pnin's appearance in the novel corresponds to the actual look of the author and the portrait of the character turns out to be the self-portrait of Nabokov himself, although exaggerated, but easily recognizable. "Ideally bald, sun-tanned, and clean-shaven, he began rather impressively with that great brown dome of his, tortoise-shell glasses (masking an infantile absence of eyebrows), apish upper lip, thick neck" (Nabokov, 1997). The speech of the character interlards with literary quotes of Nabokov himself. In particular, the "real" author grants the character a number of his personal observations about "The Death of Ivan Ilych" novella and "Anna Karenina" novel, which can be found in Nabokov's lectures on Leo Tolstoy.

Quite an unexpected mask also appears in the novel, directly related both to Nabokov and Pnin – an American ornithology professor Thomas Wynn (Tvin or 'twin', as the character refers to him). "A lanky, bespectacled old fellow with scholarly strands of steel-grey hair falling over the right side of his small but corrugated brow, and with a deep furrow descending from each side of his sharp nose to each corner of his long upper-lip" (Nabokov, 1997). An "owlish" person, whose path Pnin "would cross every other day at different points of progress" is a reflection of the character. Multipolarity of Nabokov's perception promotes Wynn and Pnin with their "disconcerting likenesses" and thus a number of Nabokov's masks appear in the novel. But Vladimir Vladimirovich is only a biographical twin of the writer, a sort of a lightly done sketch, whereas Pnin is Nabokov's alter ego, another consciously created self-parody mask, meditated with self-irony. This mask reflects in a "false mirror" of intricate interlacing of author's fiction and Russian-American reality featured in actual life of the author.

The technique of the author's mask becomes more and more accentuated and grotesque in Nabokov's later works. When examined closely, seemingly fictional autobiographicalism of "Ada", "Look at the Harlequins!" and, especially of

“Transparent Things” turns into quite the real one, and the writer’s “mask play” converts into an obvious, sometimes obsessional contemplations about the outcomes of his own literary career and life pilgrimage. For example, the image of Baron R. in “Transparent Things” novel is the author’s mask and is quite well recognizable. Even the name “R” itself is nothing more than a mirror image of a Russian single character word “Я” translated as “me”. It is quite notable that Baron R. has been given many traits of the author himself: from physical resemblance (“Baron R. had coarse features, a sallow complexion, a lumpy nose with enlarged pores, shaggy bellicose eyebrows, an unerring stare, and a bulldog mouth full of bad teeth” (Nabokov, 1999)) to habits and hallmarks typical of Nabokov the writer – “immune to politics”, famous (“most valuable author”), willful, writing on index cards, living in Switzerland, a master stylist: “On contact with paper it [his English] acquired a shapeliness, a richness, an ostensible dash, that caused some of the less demanding reviewers in his adopted country to call him a master stylist. Mr. R. was a touchy, unpleasant, and rude correspondent” (Nabokov, 1999).

Nabokov’s narrative strategy aims at “multiplication” of narrators as his own doubles and at conscious disguise of his author’s “self” behind their masks practically in all novels. So we can see the prose writer play with authenticity of his narrators in his unfinished “The Original of Laura”. He shows their gradual self-withdrawal from the scene (in case of Wild the withdrawal is quite real, in case of Flora it is fictional, in the book of which she is a character). Throughout the very first chapter not only the narrator, but also the character is concealed, which is preset by oblique speech in the first sentence: “Her husband, she answered, was a writer, too — at least, after a fashion” (Nabokov 2010). It is obvious that oblique speech, normally used after presentation of the character, suggests presence of a “speaker” – the narrator, who despite that, remains unrecognized for several more paragraphs – until the character (“she”) ends up in bed with him. The narrator continues to conceal his name, appearance, and steps back from his own actions, describing them with impersonal verbs. A reader can only guess that the narrator is the very same writer who inebriated Flora just met at the party (she asked what his profession was and pronounced the first phrase of the novel in reply to his answer). Nabokov keeps complicating the structure of the narrative, by “smudging” the figure of the narrator, who is destroying himself. The character speaks with dislike about both her writer husband who receives her back from her lover at the end of the chapter, and about the profession of a writer itself. And at the same time she seduces another writer who is prone to self-destruction and who writes that scene and his novel “My Laura”, where he at least fictitiously destroys Flora and himself in the end, overcoming his own “self”. Possibly, the following remark of the narrator can be considered the quintessence of Nabokov’s narrative strategy in his last text: “Would the letters of my name do? Its recurrent “i” coinciding with our favorite pronoun suggested an elegant solution: [...] in an instant, [...] I could mark lightly by transverse marks the three divisions of my physical self: legs, torso, and head” (Nabokov, 2010). Considering Wild’s remark about recurring “i” in his name – Philip Wild – and its meaning “I”, we could suggest that “self-obliteration” of Philip Wild is metaphorically related to self-deletion of not only the narrator’s “self”, but also, the writer’s “self” in the text.

4 Summary

Therefore, it is obvious that the Nabokov’s narrative strategy in his English prose is getting significantly more expanded and complicated from “The Real Life of Sebastian Knight” to “The Original of Laura”. In all Nabokov’s novels, we can see that his narrative strategy aims at “multiplication” of his own doubles and deliberate concealment of the author’s “self” behind their masks. However, from creating fictitious narrators as portrayals of author’s masks within quasiepic narration pattern, often taking exaggerated and grotesquely attenuated forms, the prose writer moves on to play with narrators’ authenticity, showing their gradual self-obliteration. Thus, the writer is not only playing with his reader, but also playing with the concept of

possible “segregation” of the author’s image itself and identification of the “real” author based on the one present in the text.

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Primary Paper Section: A

Secondary Paper Section: J

INITIATE EDUCATION IN CONTEXT OF MULTICULTURAL APPROACH TOWARDS EDUCATION OF ADULT ROMA FROM MARGINALIZED COMMUNITIES

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This paper is the outcome of the project solving VEGA nr. 1/0084/17 The concept of education of adult Roma from marginalized communities financed by the resources of Ministry of Education, Science, Research and Sport of the Slovak Republic.

Abstract: The subject of this study is the analysis of the relation among the cultural capital of adult Roma from marginalized communities in Slovakia, their competency to communicate in the Slovak language and adult education. Adult Roma from marginalized communities as a target group of education are characterized as carriers of Roma culture and of the culture of poverty at the same time. In this context the paper brings the identification of the barriers for formal and non-formal education of this part of adult Roma population and the formulation of the aim, intentions and principles of the initiate education of adult Roma with unfinished and finished primary education.

Keywords: Roma, community, marginalization, adult education, cultural capital, language code, initiate education.

1 Introduction

The concept marginalization “implicitly includes the procedural side of pushing to the margins of community” (Lukáč 2010, p. 38) and involves a serious assumption that “a human is pushed to the margins of community without his or her effort, by the super-individual social processes that he or her can hardly influence” (Lukáč 2010, p. 38). Besides that, it also happens on the basis of inherent or gained physical and mental handicaps or of their combination. Marginalization became a part of the concept of social exclusion. Ďzambazovič & Jurásková (2002) define social exclusion as an uneven approach towards education, employment, living, social protection, health care and as a hindered approach to social institutions responsible for the distribution of life chances. Marginalization of the individual Roma in Slovakia is more intense in separated, but mainly in segregated Roma communities (Mušínska et al. 2014). The majority defines Roma community on the basis of anthropological features, cultural reference, way of life – lifestyle and life space. They see Roma subjectively as a different group in positive and negative sense (Jurásková et al. 2004).

We assume that the emphasizing of difference of Roma in education, whether in negative (insufficient readiness for school education, not knowing of the language in which the teaching is realized etc.) or positive sense (approach emphasizing positive features of Roma culture leading to the mystification of Roma cultural identity) leads to the separation of Roma from the system of lifelong education. We do not deny the meaning of knowing of cultural differences, but we want to point to the fact that they are developing and changing in interaction with other cultures and social system. In education, as a tool of social integration of Roma, not only the inclusive child education is relevant, but also adult education, which needs to be explored more intensively. Education of adult Roma should be explored in interaction with cultural and social contexts what enables a multicultural approach of B. Fay towards social sciences.

2 Multicultural approach towards adult Roma education

Fay's dialectical mode of thinking comes from *interactionism*. According to Fay (2012 p. 233) „as a view of human history and culture interactionism conceives of the relation of the self and other dialectically; it denies that ‘at bottom’ the self and the other are essentially distinct and fixed, or that a particular identity means utter difference from that which it is not. Instead it insists that the identity of the self is intimately bound up with identity of the other (and vice versa), that self and other are

constantly in flux, and that they are both similar as well as different.“ Inclusion of adult Roma from marginalized communities into lifelong educational system is necessary for the ones who are segregated in Roma communities. „Members of social groups are not interchangeable units whose behavior merely fulfills certain social functions or roles in a ‘system’, but „human beings appropriate their culture, they don’t reproduce it. They apply old rules to new situations and in the process change the rules“ (Fay 2012, p. 242). We suppose that adult Roma from marginalized communities have a potential to change the old cultural rules, but the presupposition for the change is experience from other situations, the knowing of different social environment and relations than those that they experience in their culturally isolated, segregated social environment, as well as the raise of income in family, ideally through participation in the official labor market (by employing themselves or undertaking). „Culture and society both limit and enable – an sometimes enable by limiting“ (Fay 2012, p. 243). We need to identify the limits of participation of adult Roma in education. In relation to further education in Slovakia, a sociological survey identified the problems of lifelong education, for example financial guarantee of further education and disinterest of adults in further education with primary and unfinished secondary education (*The strategy of lifelong education 2011*). Adult Roma from marginalized communities take most often part in the education realized and financed by the EU funds, respectively as a part of re-qualification education organized by various educational institutions. After the projects are finished, usually the educational activities finish, too; whereby their effectiveness is not sufficiently monitored.

In the education of adult marginalized groups it comes to interaction of various groups and cultures, also in a less desired case when the carrier of other culture or a member of other social group is only the educator or the educators. According to Fay (2012 p. 233) „consequently interactionism focuses on the points of contact between different groups, especially on those bridgeheads which serve as the basis for exchange.“ In the connection with scientific research and practice of adult Roma education from marginalized communities we realize the relevance of the statement that ‘exchange’ should not be understood as always a pleasant and willing sharing; provocations, threats, and resistances are all forms of exchange which involve being forced to evaluate and sometimes to abandon or to alter old ways“(Fay 2012, p. 233). In scientific research and in the practice of adult Roma education from marginalized communities we need to remember that culturally and socially various groups come into interaction and that the carriers of various cultural capitals interact.

2.1 Adult Roma – the carriers of cultural capital

The theoretical basis for the analysis of cultural capital of adult Roma from marginalized communities is the theory of cultural capital (Bourdieu 1987, 1997; Bourdieu & Passeron 1990), in which the basis is the relation among cultural capital, social stratification, social reproduction and the theory of cultural mobility (DiMaggio 1982). According to Bourdieu and Passeron (1990) children inherit cultural capital from their parents and alongside with economic and social capital it determines the social position in the community. It becomes a source of social unevenness in the community. Social reproduction in the modern society is reached and legitimized through cultural reproduction, which is a hidden transfer of economic capital. Economic capital (or economic resources) are resources „immediately and directly convertible into money and may be institutionalized in the form property rights“(Bourdieu 1997, p. 47). Family and educational system are crucial motive powers in the process of social reproduction.

The level of economic capital, mainly in the families living in segregated Roma communities, is very low. Low incomes in the

family are related to unemployment that involves 3 from 4 people in the age of 15 - 64 years (Gerbery 2013, p. 4-5). An income that is lower than 100 euro per family member endangers children's nutrition. This level of the income increases the probability of repeated situation of a real absence of food for children. The average income below this level had, according to the monitoring, Roma households without a working member (94,63 €), households with five and more members (99,24 €) and households with small children (92 €) (Filadelfiová et al. 2012, p. 10). These data confirm that adult Roma from segregated communities belong in Slovakia to the lower social class, for which a low level of cultural capital is typical. This is especially relevant for us in relation to adult education.

According to Bourdieu (1997) cultural capital presents itself in three forms: an embodied state, an objectified state, and an institutionalized state. In the embodied state, cultural capital refers to what Bourdieu called *habitus*, the dispositions (e.g., attitudes, intentions, expectations, beliefs, etc.) orientating one's practices (Bourdieu, Wacquant 1992). In the objectified state, cultural capital presents itself as cultural goods, such as books, paintings or musical instruments. In the institutionalized state, cultural capital refers to cultural competence that has been officially sanctioned, such as educational qualifications.

The results of the analysis of educational structure of Roma population outside of school system serve as a basis in the relation to institutionalized form of cultural capital in Roma families (sample 1083 Roma households) (Filadelfiová et al. 2012). 18,4% of Roma had unfinished primary school, 59,7% of Roma had finished primary education, 17% of Roma finished secondary education, but only 1,8% of them passed the school leaving exam, 0,3% of Roma had higher education and 4,7% of Roma attended special school (Filadelfiová et al. 2012). The Roma from segregated communities had the lowest level of education, what confirms the low level of institutionalized form of cultural capital.

An embodied cultural capital can be reflected in the attitudes of adults towards education and learning, in their effort to participate in adult education. According to Kumanová and Džambazovič (2002), a traditional extended Roma family is in contrast with the individualized structure of the society. Jakoubek (2004) emphasizes that the unevenness inside and outside of Roma culture related to "the institute of ritual impurity" and its values is in contrast with the values of the majority (Jakoubek 2004, p. 50). This implies that 'the other' than expected attitude of adults towards education comes from the basis of Roma culture. Specific patterns of behavior connected to the orientation to the present and everyday surviving (Payne et al. 2010) are often related to Roma culture. But these behavior patterns are typical for the people suffering from generation poverty. Payne et al. (2010) state that also for example belief in fate, in the identity of a man connected to the role of lover and fighter and the identity of a woman connected to the role of protector and sufferer belong to these patterns. Men are expected to work hard physically and to be lovers and fighters. A 'good' woman is expected to take care of her man/husband and children. In relation to that, adult Roma name and emphasize their own abilities that are in women connected to housework and care for family members and in men to their work activity (Lukáč, Pirohová 2016). The aim of the work is to earn money for living, not to develop a career (Payne et al. 2010). Philosophy and formulation of aims of lifelong education is too abstract for the people who live here and now and future is just an abstract concept for them. Moreover, the majority of them never experienced success in school system, what can markedly influence their disinterest in further education.

Educational system, the second agent of cultural and social reproduction, selectively strengthens the cultural capital gained in the family. According to Bourdieu & Passeron (1990), school reinforces the dominant culture in the society, the culture of the dominant, economic class. It provides the pupils and students from the dominant culture a more convenient position. It reflects in successful student career and in the success at labor market.

Said with other words, cultural capital of the dominant culture is in harmony with the requirements of labor market and cultural capital of adult Roma from marginalized communities is not.

DiMaggio (1982), opposed to Bourdieu, supposed that the influence of cultural capital on educational practice is rather independent from social background. He formulated a hypothesis of cultural mobility. Specifically, an embodied state of cultural capital is not dependent only on the home background. DiMaggio acknowledges the importance of cultural capital determined by the opportunities, but doubts the idea of attribution and reaching of cultural capital by social background. According to him, the decision of adults to participate in education is a result of the individual agenda of personality and of the resource of cultural capital (mainly of the reached education).

Globally, adults with higher education take more part in adult education (e.g. Desjardins, Rubenson, Milana 2006; Saar, Ure, Hoford 2013). Cincinnato, De Wewer & Valcke (2014) confirmed the differences in the amount of participation in adult education among people with lower and higher qualification in connection to the differences in (family) cultural capital.

Cincinnato, De Wewer, H. Van Keer & Valcke (2016) used secondary analysis of data from the research *The Programme for the International Assessment of Adult Competencies (PIAAC)* (OECD 2013a, 2013b, 2014) to explore the relation among participation in formal and non-formal adult education and institutionalized cultural capital, the capital of the family measured by the highest degree of parents' qualification, their own cultural, institutionalized capital and among a disposition towards learning or readiness to learn as an indicator an embodied state of cultural capital. They found out that a strong predictor of adult participation in education was institutionalized form of cultural capital, whereby a direct predictor is their own cultural capital (reached education) and institutionalized capital of parents as a predictor of their own cultural capital (Cincinnato, De Wewer, Van Keer, Valcke 2016).

„Low resource“ of the institutionalized form of cultural capital, closedness of the system of formal adult education in school system (not only due to financial reasons) as well as of further education for adult Roma from marginalized communities do not create conditions to increase their participation in adult education in Slovakia for a long time. The acquired orientation to the present, given from generation to generation, the indicator of the embodied cultural capital and failure in school presuppose their resistance towards adult education, or their indifferent attitude. The meaning of the increase of the education degree and of the level of basic competencies is surely important for the participation of adult Roma in adult education, as well as for their children to whom they give their cultural capital, respectively for the next generations.

Without the acquisition of basic competencies, the effectiveness of their further education is problematic. An important tool of inclusion into the system of formal and non-formal adult education is language, but people communicate with understanding only to such extent to which they use the same system of signals and assign the same or similar meanings to them (Pittenger, Hockett, Danehy 1960 in DeVito 2001, p. 28).

2.2 Language code – the barrier in adult Roma education

The key competencies in the Slovak language belong to basic competencies for the inclusion of adult Roma into the system of lifelong education. A mother tongue of Roma from marginalized communities is usually a Roma dialect. In the interaction with members of the neighboring communities they are usually confronted with various Slovak dialects rather than with literary Slovak language. So adult Roma are in uneven starting position compared to the education participants whose mother tongue is Slovak. Insufficient knowing of the Slovak language alongside with the restricted language code are significant features of the social exclusion of the big part of Roma race. This

disadvantaging of adult Roma in education is also accompanied with the low level of the institutionalized form of cultural capital and of basic key competencies that they did not gain, respectively gained insufficiently in school. Bernstein (2000, 2009) is the author of critical theory of symbolic control and cultural production, reproduction and change, which belongs to the important theories of cultural and social reproduction. Similarly as in the theory of cultural capital of Bourdieu, the basic agents of cultural and social reproduction are family and school. His theory of language codes, based on the relation of language, education and social structure is also known. Bernstein summarizes the studies about the relation among language, education and social structures, which are the bases for us, in his book *Class, Codes and Control. Volume 1. Theoretical Studies Towards a Sociology of Language* (Bernstein 2005).

According to Bernstein (2005, p. 32) „language is considered one of the most important means of initiating, synthesizing, and reinforcing ways of thinking, feeling and behavior which are functionally related to the social group.“ Bernstein in his studies and research dealt with and confirmed the relation among the language, social class and success in school. The target group were not adults; but he assigns the language and the way of communication to the researched groups (he uses the term class often) in general. He compares the language of middle class with the language of members of non-qualified and half-qualified classes. Lower social-economic groups use different structure of language than higher social groups. The language-use of middle class is rich in personal, individual qualification, and its form implies sets of advanced logical operations; volume and tone and other non-verbal means of expression, although important, take second place. This mode of language-use is called *formal* (Bernstein 2005, p. 21). Various terms used to express intention imply various experience connected to the ordering of social relations, socialization and upbringing in family. Middle classes differ from lower classes:

- an awareness of the importance of the relationship between means and ends and of the relevant cognitive and dispositional attributes,
- a discipline to orient behavior to certain values but with the premium on individual differentiation within them,
- the ability to adopt appropriate measures to implement the attainment of distant ends by a purposeful means/end chain (Bernstein 2005, p. 18).

A child from middle class is from the beginning being prepared for the gradual fulfillment of long-term intentions/aims; his or her future is understood directly in relation towards education and emotional life. Formal education and learning play an important role. The system of education is set for the future in its own philosophy. Adults from middle classes naturally connect their life and development of professional career with education and learning. „Language exists in relation to a desire to express and communicate; consequently, the mode of a language structure – the way in which words and sentences are related – reflects a particular form of the structuring of feeling and so the very means of interaction and response to the environment (Bernstein 2005, p. 19).

Lower social classes, including our target group, use *public language*. “The term public language refers to common linguistic mode which various forms of communication, dialect, etc. share (Bernstein 2005, p. 32), so it is common also for adult Roma communicating in various Roma or Slovak dialects. The characteristics of a *public language* are:

1. Short, grammatically simple, often unfinished sentences, a poor syntactical construction with a verbal form stressing the active mood.
2. Simple and repetitive use of conjunctions (so, then, and, because).
3. Frequent use of short commands and questions.
4. Rigid and limited use of adjectives and adverbs.
5. Infrequent use of impersonal pronoun as subjects (it, one).

6. Statements formulated as implicit questions which set up a sympathetic circularity, e.g. ‘Just fancy? ‘It’s natural, isn’t it?’ ‘I wouldn’t have believe it’.
7. A statement of fact is often used as both a reason and a conclusion, or more accurately, the reason and conclusion are confounded to produce a categorical statement, e.g. ‘Do as I tell you’, ‘Hold on tight’, ‘You’re not going out’ ‘Lay off that’.
8. Individual selection from a group of idiomatic phrases will frequently be found.
9. Symbolism is of a low order of generality.
10. The individual qualification is implicit in the sentence structure therefore it is a language of implicit meaning. It is believed that this fact determines the form of the language (Bernstein 2005, p. 28).

These characteristics interact cumulatively and strengthen themselves mutually. It is important and essential for the educational processes „that other forms of language-use (e. g. formal language) will not be directly comprehensible but will be mediated through public language (Bernstein 2005, p. 37). That means that the meaning of the coded message for the recipient – for the one being educated from lower social classes, can be incomprehensible, which can result in mutual misunderstanding.

Bernstein (2005 p. 58) on the basis of „interrelationship between social structure, language-use and subsequent behavior“ elaborated two basic language codes: *elaborated* and *restricted*. „They can be defined, on a linguistic level, in terms of the probability of predicting for any speaker which syntactic elements will be used to organize meaning“ (Bernstein 2005, p. 58). In the case of an *elaborated code*, the speaker will select from a relatively extensive range of alternatives and therefore the probability of predicting the pattern of organizing elements is considerably reduced. In the case of a *restricted code* the number of these alternatives is often severely limited and the probability of predicting the pattern is greatly increased. On a psychological level the *restricted code* inhibits the orientation to symbolize intent in a verbally explicit form. The change of meaning is expressed non-verbally; verbal expression is reinforced by expressive features. The speech takes place on the background of local environment, where the closeness is emphasized and an individual identifies with their group and deduce their self-realization from the group (Bernstein 2005). Brief structures of the *restricted code* are acquired in informal learning and their acquisition requires less time than the acquisition of *elaborated language code*.

Bernstein distinguishes *restricted code* from *elaborated code* on the basis of summarization of the sociological conditions as follows:

- (1) *Restricted code* (lexicon prediction): ritualism
 - *restricted code* (high structural prediction) – Model: universalistic; meaning particularistic
 - *restricted code* (high structural prediction) – Model: particularistic; meaning particularistic
- (2) *Elaborated code* (low structural prediction) - Model: particularistic; meaning universalistic (Bernstein 2005, p. 61)

In the communication in *restricted language code*, the poor vocabulary is predictable and takes places according to the structured and cyclic rituals. Lexical prediction is connected to the fact that 1) the status or positional aspect of the social relationship is important; 2) orientation is likely to be towards the extra-verbal channels as new information will pass through these channels; 3) specifically verbal planning is confined to choice of sequence, rather than involving the selection and organization of the sequence, 4) the code restricts the verbal signaling of individual difference. The meaning of words is particularistic; it is connected to local social structure and local tools and aims, the model of speech is universalistic and dependent on the characteristics of the form of social relations. If they change, the speech can take place according to the particularistic model; but the meaning of words is always

particularistic. In the communication in elaborated language code, universalistic meanings are used with regards to summarized general social tools and aims; the model of communication is particularistic, dependent on the environment and situation.

We can say that in communication in the process of adult education of Roma from marginalized communities is problematic not only poor vocabulary in the Slovak language but also particularistic meaning of words reflecting local social structure and specific, rigid ordering of meanings coming from the forms of social relations, socialization, type of education in extended family and in segregated community.

Problematic is the decoding of the meanings about processes, phenomena and situations that they did not experience; understanding of the degree and level of the phenomena, processes, characteristics and the expressing of their own opinions and feelings. Although „a restricted code contains a vast potential of meanings,“ it is a form of speech which symbolizes a communally based culture (Bernstein 2005, p. 117). We deduce from the stated that an effective, active participation of adult Roma from marginalized communities in formal and non-formal education requires the so-called „training“ education for education. We do not use the term compensation education, but initiate education, because the concept of ‘compensatory education’ „distracts attention from the deficiencies in the school itself and focuses upon deficiencies within the community, family and child“(Bernstein 2005, p. 148), in our case an adult. Previous experiences of adults with school education have an influence on their attitudes towards school and learning and significantly influence their approach towards further education.

3 Initiate education of adult Roma from marginalized communities

We do not connect the meaning of the term initiate education to the initiate rituals of entering the world of a student or with the initial introducing and reasoning of the meaning of a subject by a teacher to a student. The aim of the *initiate education* is to bring adult Roma from marginalized communities without and with primary education to for them ‘abstract world’ of education. This type of education does not replace second chance education; its aim is the readiness of adult Roma to learn and educate through:

- Understanding of the benefit of education and educating,
- Widening of the vocabulary in the Slovak language,
- Understanding and interpretation of the meaning of words and collocations in the context.

The first reasoning of the meaning of initiate education is connected to the fact that it is important for active, voluntary participation of adults in education that adult Roma consider education important for their life in family, community, in relation towards their application at labor market. Educational activities of adult Roma are so far a part of targeted using of the EU tools to increase social inclusion of Roma race. Complementary type of education is requalification education realized through the Central Office of Labor, Social Affairs and Family through the scheme RE-PAS. From the long-term point of view, the contribution of educational courses realized within various projects is minimal. Many Roma consider the contribution of these activities problematic, they do not see any real influence on their life situation and they are often sure that passing of the courses and gaining of the certificates will not help them to find their place at labor market (Hurrle 2012).

Adult Roma can be identified as a target group of education on the basis of the deficit of education and of low level of key competencies in the relation towards their application at labor market, but they do not have to see themselves as target group of adult education. The first source of their presupposed indifferent attitude towards adult education is connected to their orientation to the present and to the fact that their consider work to be the source of their living and they do not connect it to the need of

further education. It is also connected to the understanding of the role of a man (ensures family through physical work) and the role of a woman (cares for the children and husband). The man does not need to educate for a long time to be able to work physically and a woman does not need to educate, she learns from her mother and later mother-in-law to care for her children and husband. She works when a man is unable to bring enough money. A man feels successful when he can ensure his family materially and can protect the members of his extended family. A woman feels successful when she can cook tasty meals and care for her children and husband. The second source of their presupposed indifferent attitude towards adult education is their own failure in school.

At the same time we realize that the indifferent attitude towards lifelong education of children of adult Roma from marginalized communities can gradually change for the people who worked abroad, returned, increased the level of economic capital of the family and so they increased the chance for higher education of their children, the presuppositions for the change of their attitude towards education and education at adult age. We consider it important to empirically verify whether this specific group of people changed their relation towards their education and education of their children, what kind of changes these are and what their cause is.

The second reasoning of the initiate education's meaning is related to the need of widening of vocabulary in the Slovak language and of increasing the ability to understand and interpret the meaning of words and collocations in the actual context. We are convinced that without this preparation a chance of adult Roma to gain primary or secondary education in second chance education and to develop key competencies in further education decreases. We also realize that although the Slovak legislation enables adults to finish primary or gain secondary education, this possibility is neither being used nor supported by the state authorities. Adult Roma, but also adults from the majority with unfinished or finished primary education have a bigger chance to increase their education degree during being imprisoned, because the second chance education has a long-term tradition and legislative and organizational conditions in the system of penitentiary care.

The way of education in initiate education, concerning the identified specifics of the target group, aim and intentions should be built on the principles ‘*respect and engagement*’, ‘*dialogue*’, ‘*practice*’ and ‘*needs*’. We identified the principles of education in interaction with the analysis of the basic andragogic theories of adult education (humanistic, critical theories) in the discourse of multicultural approach of B. Fay (Pirohová, Lukáč, Lukáčová 2016). Taylor (1998) characterizes Freire's educational concept as a social emancipatory approach to transformative learning. „Scholars who approach transformative learning from the social emancipatory perspective refer to transformative outcomes that involve the development of critical consciousness whereby people perceive themselves as active subjects in the world rather than passive objects to be acted on by unfair social practices, norms, and institutions“ (Hoggan 2016 p. 62). This is also the mission of adults' alphabetization, even if the aim of the education is the ability of adults to read and write. Alphabetization is understood as an act of knowing (Freire 2000).

The educator, who plays an important role in the concept of Freire's education, concentrates on how to turn passive learners into active participants. „The culture of the learners increasingly becomes the basis of the learning process“(Mayo 1999, p. 63). According to Torres (1990), Freire knew that adult educators could bring into educational situation cultural capital, which is in contrast to the cultural capital of learners and this can represent the full strength of the power of domestication. Freire (2000) states that these differences must be softened in the relations between educator and learners, that is why the role of educator is to learn culture and community, which is partly created by the localization of a learner. Fay states (2012, p. 238) that „learning about others and oneself can also produce tension and fear as

much as openness and willingness to explore alternatives as a way to growth.“ Not everything related to the cultural practice of Roma from marginalized communities must be acceptable for educator. Not to agree with different opinion or with understanding of a situation does not mean not to respect others. „Respect means the willingness to listen, openness to the possibility of learning from, responsiveness, criticizing when necessary. Respect means to engage with intelligence, sensitivity, and open-mindedness“(Fay 2012, p. 239). The principle of ‘*respect and engagement*’ formulated by us is related to the ethic dimension of education and is a condition for authentic dialogue in education.

The codified existential situation of learners is the methodological tool (Freire 1978). In practice it involves the search for words – keys (in alphabetical phase) and topics – keys (in post-alphabetical phase). These words and topics must represent real problems of learners. Learners should propose topics on their own and should be the ‘subject of their own thoughts’.

This educational process serves the aim that learners create a distance from their life problems and are able to critically think about them. It leads towards the actual and theoretical connections and back to the actual, thanks to which they can think and try for the new forms of ‘*practice*’. Applying of the principle ‘*practice*’ is important also for the initiate education of adult Roma from marginalized communities. In the educational process this means a search for and choice of words and topics related to the practice of Roma; words that they use and topic that are important for them. Visualization of the words and consequential assigning of words in the literary Slovak language, Roma, Slovak or other dialect that learners and teachers use to denote the visualized thing, person and process enables to widen learners' vocabulary in the literary Slovak language and teacher's vocabulary in Roma or other dialect. Visualization of the situations, to which the used words are connected, creates presuppositions of the meaning's understanding of words and collocations in relation to the context. We took over the principle of ‘*need*’ from the concept of self-directed learning introduced by Knowless, Holton & Swanson (2005). In the Knowless' model of education this is the first step in the process of education: adults need to know why they must educate. The aim of the initiate education of adult Roma is the awareness of the need to educate. This involves identification of the problems of adult Roma in *dialogues* and reasoning using actual, again visualized situations, which will contribute to the awareness why, while solving such situations, an actual knowledge, abilities or competencies are needed.

4 Conclusions

Roma race is culturally and socially heterogeneous. Adult Roma men and women from marginalized communities, unemployed and poor are the carriers of cultural capital, which puts them to the margin of the society. The segregation and isolation of Roma communities in Slovakia conserves the generational transfer of cultural capital and social reproduction in the society in a reciprocal way. Emphasizing of the difference of Roma culture, whether in positive or in negative sense, leads to their involuntary assimilation or segregation, to the exclusion from the system of lifelong learning. We do not deny the cultural differences or the meaning of codification of Roma language, but the generational behavior patterns of adult Roma from marginalized communities assigned to the Roma race in general are more in accordance with the behavior patterns of generational poverty. Education of adult Roma women and men (low level of education) cannot be effective unless the barriers (handicaps, unevenness) in adult education are gradually eliminated in the long-term and inter-subjective process of education. They involve mainly low level of education and restricted language code. Initiate education of adult Roma women and men cannot replace formal education (second chance education). Its mission is to prepare educators and learners for social interaction in the process of education determined by the differences between cultural capital of educator and learners and

of learners and majority of population. Based on the analysis of cultural capital of adult Roma from marginalized communities and used language code we formulated the aims and intentions of the initiate education of adult Roma and principles of the initiate education such as *respect, engagement, dialogue, practice* and *needs*. In the initiate adult education we also emphasize inevitable changes in the competencies of adult educator towards strengthening of multicultural and consultative (facilitating) competencies into educational processes. We state that the application of transformation of the teaching process of adult Roma in the sense of Bernstein's concept of framing (from teaching practices based on strong framing towards teaching practices based on weak framing) is also necessary.

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Primary Paper Section: A**Secondary Paper Section: AM**

PREFERENCES OF CURRENT FEMALE UNIVERSITY STUDENTS – FAMILY OR CAREER?

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Abstract: The main objective of this article was to establish the attitudes of female university graduates to motherhood and family life and to what extent they prefer career to family. The survey should verify whether the prevailing opinion on the correlation between the growing number of career-oriented women and the achieved level of education as opposed to those family-oriented, is true. The participants in the survey were 218 female students in total who study at the same faculty but in different fields of study, i.e., social work and economics and management. Female social work students gave statistically significantly different answers than those studying Economics and management. There were differences in partial questions (e.g., the size of the salary which would make female students delay motherhood) verified using the Mann-Whitney Test, as well as in the overall typology. While female social work students unambiguously prefer questions focused on children and family, those studying economics and management value career more, as proved by the Wilcoxon signed-rank test. Hence, the orientation of women does not only relate to the educational level, but very significantly to the field of study as well.

Keywords: preferences of female university graduates, family-oriented, career-oriented, motherhood planning, work-family balance

1 Introduction

Since 1989, our society has gone through a number of crucial changes. One of them was the change on the labour market and related legislation, for example, the progressive opening of foreign labour markets, the possibility to do business and many others. Education went through a number of changes in the 1990s as well. New universities, both public and private, emerged, and the number of students increased dramatically. On the other hand, the number of contracted marriages and the birth-rate started to decline. The number of contracted marriages has been showing a declining trend since the 1990s. The lowest number of marriages was in 2013 (43,500). After this year, a moderate year-by-year increase in contracted marriages has been recorded (Czech Statistical Office 2016). Although the number of marriages is growing again, some young people do not plan to get married (Dudová et al., 2017).

The decision on whether to prefer career to family life is usually rather up to women. Apparently, women are more willing to give up their career for the benefit of work-family balance in this respect (Fernández-Cornejo, 2016). Work-family balance issues are currently being examined not only by scientists conducting research in different fields, but many employers as well, since they realise how much this topic affects the quality of life (Baral, & Bhargava, 2011; Goñi-Legaz, & Olló-López, 2016; Quinn, 2011). Research has proved that imbalance between work and family life results in a number of negative issues, such as a considerable inability to work in consequence of a disease or premature retirement (Agosti, 2015).

The status of women on the labour market is complicated. According to some authors, women are discriminated, their status is restricted or disputed (Čermáková, 1997; Orser, & Lesk, 2010), some draw attention to the gender pay gap (Grönlund, 2017). Other authors consider push and pull factors in this respect and distinguish whether women “leave” executive positions or are “driven out” (Kossek, & Wu, 2017).

The woman’s personality will certainly play an important role, as well as her values, attitudes and preferences. Hakim (2000) distinguishes three basic types of women: those family-oriented (about 20%), career-oriented (approx. 20 % as well) and adaptive (60 %) representing the largest group. Family-oriented women usually prioritise their children and family life. Career-driven women usually have no children, their main priority is their job or important activities in the public sector or other areas

(politics, sports, arts, etc.). Adaptive women want to combine work and family.

Weidnerová and Matějů (2015) conducted an extensive survey which concluded that the higher the education achieved, the weaker the women’s orientation towards family life and household. Hence, with higher education grows work career orientation.

The statistics in the Czech Republic confirm that the proportion of women studying at universities is growing. Currently, female university graduates represent more than half of students at most universities. In 2016, total of 67,363 students graduated from public universities, of whom 40,027 were women. The biggest number of students graduated from Charles University in Prague and Masaryk University in Brno. These universities feature a significantly prevailing number of women as to the graduates (ČSÚ, 2017). This article verified whether the above-stated typology of women (i.e., career-oriented as opposed to family-oriented women) can be generally applied based on specified socio-economic features, in this specific case, considering the educational level.

2 Methodology

The purpose of this article was to identify the differences in attitudes of female university graduates to motherhood and family with respect to the field of study. A written questionnaire was selected as a research method. The questionnaire contained 22 closed and open questions. 218 female students at the Faculty of Social and Economic Studies of UJEP in Ústí nad Labem, doing either the Social work field of study (106) or Economics and management (112), participated in the survey. Quota sampling was selected to collect data, the first quota being gender – a respondent had to be female, and the second one – she had to be a full-time student at the Faculty of Social and Economic Studies (FSE) of UJEP in the specified fields of study. Data were collected from November 2017 to January 2018. The rate of return was 100% (none of the contacted women refused to respond).

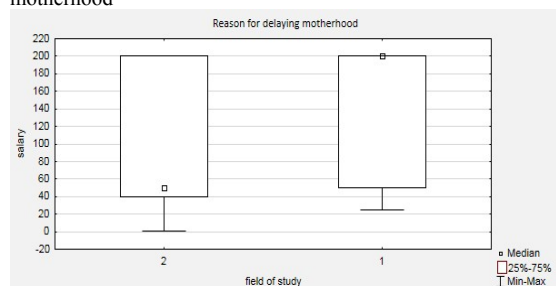
The Statistica 13 and Microsoft Excel programmes were used for data processing. The following statistical procedures were used as well: X² test of independence, paired two-sample t-test for likelihood, Mann-Whitney test, Kruskal-Wallis test, Wilcoxon pair test.

3 Results

As mentioned in the introduction, some young women tend to delay motherhood to a higher age. The first research question looked into how high their net monthly salary would have to be to follow their career path and delay setting up a family. Respondents could either show the size of the monthly salary or select the available answers: no size of salary would make me delay motherhood, or any size would make me delay motherhood. The answer “any size would make me delay motherhood” was matched with rating 1 on the number line, and rating 200 was matched with the answer “no size would make me delay motherhood”, since the highest selected salary was 100 (thousand CZK). Six responses were disqualified due to an missing answer to the question. The following box-plot shows these ordinal data (box-plot) No. 1.

It is obvious from Chart 1 that female social work students value setting up a family more. The size of salary which would make them delay setting up a family is higher as to the minimum, lower quartile and the median. 50 % of female social work students state that no salary (in chart 200) would make them delay motherhood. 50 % female of economics and management students would delay setting up a family due to a salary up to CZK 50 thousand.

Chart 1 Size of salary which could be a reason for delaying motherhood



Source: own

The Mann-Whitney test confirmed the differences in the division of both groups of female students indifferent fields of study. Results are shown in the Table 1.

Table 1 Differences in attitudes to delaying motherhood between female social work and economics and management students

Mann-Whitney U Test						
Rank Sum Group 1	Rank Sum Group 2	U	Z	p-value	Z adjusted	p-value
9638.500	12939.50	3752.50	4.17239	0.000030	4.41820	0.000010

Source: own

The test confirmed that establishing a family is more important for female social Work students than for those studying Economics. These would consider delaying setting up a family with a far lower salary than female social work students.

The answer “no size of salary would make me delay setting up a family” was marked by 67 female social work students of 104. Only 33 female economics students marked this question of the total number of 108 female students. To validate whether the rate of female social work students is statistically significantly higher than in female economics students, statistical testing was used. Null hypothesis H0 was tested: $\pi_1 = \pi_2$ as opposed to alternative hypothesis H0: $\pi_1 > \pi_2$. π_1 marks the rate of female SW students who would not want to delay motherhood due to any size of salary. Rate π_2 refers to the rate of female economics students who do not want to delay motherhood due to any size of salary. The test criterion value is 5.35. It will exceed the critical value of 1.65 (the value of the 95% quantile of the standardized normal distribution) and the null hypothesis on equality of both parts is rejected. The percentage of female SW students who would never delay motherhood due to any size of salary is statistically significantly higher than female students of economics and management.

Respondents were asked how many children they want to have. As Table 2 shows, female students want to have two children most frequently. Three or more children were shown more by female social work students. There was also a significant number of female economics and management students who declare they will not have any children (nearly a quarter).

Table 2 Number of children wanted

Line descriptions	0	1	2	3 or more	I have never thought about it	I already have children	Total sum
Social work	8	10	41	16	13	18	106
Economics and management	41	10	37	10	10	4	112
Total sum	49	20	78	26	23	22	218

Source: own

Respondents were also asked whether they would follow their career path before maternity leave. Only students who have no children were asked to answer the question. There were 191 female students. Of this number, there were 83 female social

work and 108 economics and management students. Students answered using a four-point scale- strongly agree, agree, disagree and strongly disagree. The chi-squared test of good concordance was used to verify whether the answers on this scale depend on the selected field of study. The p-value in this test was $p = 4.70371E-09$, so the independence was rejected. The median concordance of both groups was tested using the Kruskal-Wallis test due to the ordinal answers to the question. Results are shown in Table 3.

Table 3 Differences in attitudes to preferring career to motherhood between female social work and economics and management students

Kruskal-Wallis ANOVA by Ranks; Kruskal-Wallis test: $H(1, N=191) = 34.14132, p = .0000$			
Career	Valid n	Sum of ranks	Mean Rank
Social work	83	5923.50	71.3675
Economics and management	108	12412.50	114.9306

Source: own

As mentioned in Methodology, a questionnaire was selected for written interviews. It contained 22 questions in total. Some of them were selected to measure career preferences or family preferences. The questions were:

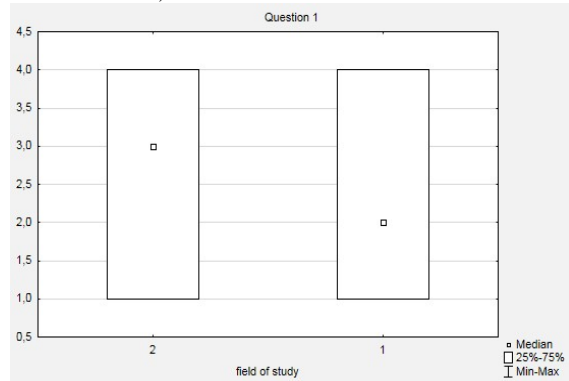
1. I do not want to have any children, I prefer success at work.
2. I am prepared to delay motherhood due to my career (up to the risky age of 35).
3. My life without children would have no purpose.
4. Delaying motherhood to a higher age (more than 35) is risky.
5. I think work and family life can be joined together.
6. Having children is our mission.
7. I chose a field of study where I expect career growth.
8. I would be ready to have an abortion due to my career.
9. Career comes first (build the position, salary, etc.) then family.
10. Women should take the longest possible maternity leave in order to bring up children properly.

Students could use the scale with the answers - strongly disagree (coded 1), disagree (coded 2), agree (coded 3), strongly agree (coded 4) or they could select an answer - I have not considered such a question or "I already have children". Students who had not considered the question or those who had already had children were disqualified from the selection group for further data processing. Once the selection group had been filtered according to the described criteria, 144 respondents were left, of which 62 were social work students and 82 economics and management students.

The above-stated questions were divided into two groups. Questions 1,2,8,10 and 11 were those where one can expect answers in the positive spectrum given by students prioritising career. On the other hand, questions 4,5,6,7, and 12 can be expected to be positively answered by students who find family more important than building their professional career.

It is obvious from Chart 2 that the median of answers is 2 in female social work students (group 1), hence, 50 % of female students chose “disagree”. On the other hand, female economics students (group 2) answered in 50 % that maximum “agree”.

Chart 2 Comparison of career preferences in female social work students and female economics and management students (answer to question "I do not want to have any children, I prefer success at work.")



Source: own

To compare the distribution of all the questions answered by respondents of both fields of study, the Mann-Whitney test was chosen again. Its null hypothesis says that there is no statistically significant difference in distribution of both groups, against the alternative hypothesis, the adoption of which confirms the difference of distribution of both groups.

Table 4 Comparison of groups of female social work and economics and management students in all mentioned questions.

Question number	U	Z	p-value	Zadjusted	p-value
1.	824.0000	6.929479	0.000000	7.366500	0.000000
2	872.5000	6.733800	0.000000	7.047196	0.000000
4	1036.000	-6.07414	0.000000	-6.32377	0.000000
5.	1754.000	-3.17727	0.001487	-3.44167	0.000578
6.	1133.000	-5.68278	0.000000	-5.95167	0.000000
7.	1541.000	-4.03665	0.000054	-4.18577	0.000028
8.	747.0000	7.240146	0.000000	7.598166	0.000000
10.	1602.000	3.790536	0.000150	4.156436	0.000032
11.	982.0000	6.292007	0.000000	6.554525	0.000000
12.	1529.000	-4.08506	0.000044	-4.33100	0.000015

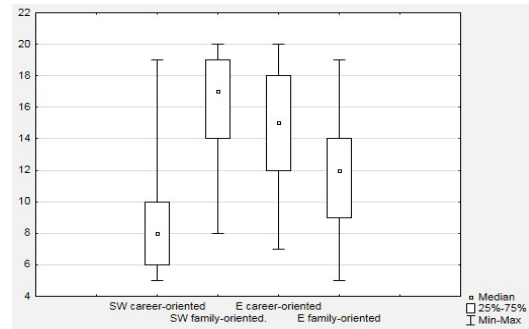
Source: own

The differences in distribution in both groups in all mentioned questions were confirmed based on the results. Female social work students gave statistically significantly different answers to all questions than those studying economics and management.

After that, coded career-focused answers (questions 1, 2, 8, 10 and 11) were added. Answers to other family-oriented questions were then added as well. These two values were marked as the "career score" and "family score". There were 5 questions in each group, so the lowest value of the sum could be from 5 to maximum 20. Box-plot charts for both groups and in both groups of questions are shown in the following chart.

It is obvious from Chart 3 that there are differences between individual groups. Social work students show median of 8, which reflects the fact that 50 % of students ranked the career-oriented questions with rather lower values (i.e., in the incongruous part of the spectrum). The median in the group of family-oriented questions is much higher and shows that social work students usually gave positive answers to these questions, as opposed to economics and management students shown in Chart 3. However, the differences are not so significant here.

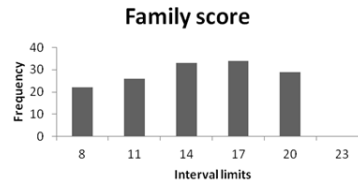
Chart 3 Comparison of the importance of career and family in female students of different fields of study



Source: own

The following charts show both values: the career score and family score. Before testing the differences in both groups, it was necessary to identify whether these values have normal distribution. Histograms of both values are shown in the following charts.

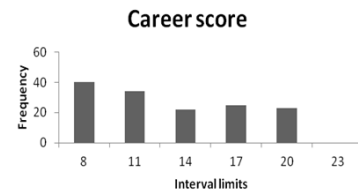
Chart 4 Histogram of the family score value



Source: own

As both charts show (i.e., charts 4 and 5), neither value has normal distribution and to test existing differences related to both groups of questions in each field of study we had to use the non-parametric pairs signed test of congruence of two medians.

Chart 5 Histogram of the career score value



Source: own

In each field of study, the Wilcoxon pairs signed test verified whether these differences in answers to the questions in the two groups (questions related to career and those related to establishing a family) are statistically significant.

The test results confirmed that there is a statistically significant difference in the answers to both groups of questions in both fields of study (i.e., questions related to career as opposed to questions prioritising establishing a family). Social work students gave lower coded answers to career-related questions more frequently, which shows disagreement, and their answers to family-related questions showed higher codes more frequently, i.e., agreement. Economics and management students used higher-coded answers to the career-related questions more frequently, which shows agreement, whereas their answers to the family-related questions showed disagreement more frequently.

Table 5 Verification of differences between both groups of questions in the fields of study

Career-related&family-related questions	Wilcoxon Matched Pairs Test		
	T	Z	p-value
Social work	102.0000	6.131183	0.000000
Economics and management	823.0000	3.699512	0.000216

Source: own

Generally, it was established that in all 10 specified questions, the answers of SW and economics students show a statistically significant difference. A statistically significant difference in female students of both fields of study in the assessment of the two groups of questions was also established, i.e., the group of questions focused on career preferences and family-related questions.

4 Discussion

Weidnerová and Matějů (2015) investigated whether the type of women related to their career or family preferences depends on education. They concluded that about 11% of female university graduates are family-oriented (the so-called family type), 28 % are career-oriented and 61 % represent the adaptive type. Women were divided into the above-mentioned types according to their attitude to the statement "Women should be prepared to reduce their paid work due to family". Females who gave positive answers were allocated to the group oriented towards household and family and those oriented towards job and career were defined by strong disagreement with the statement. Other women were allocated to the adaptive category. It seems logical that with higher completed education the number of women oriented towards career grows, while the number of family and household-oriented women declines (Hakim, 2006).

A group of questions was developed within the investigation. One half of the questions was focused on career preferences, the other half on family preferences. One of the questions was formulated very similarly as in the research of Weidnerová and Matějů (2015), i.e. "I do not want to have any children, I prefer success at work". As the results showed, the answers of the female social work students to the question showed a statistically significant difference compared to the female economics and management students. The Mann-Whitney Test verified the statistical difference in all ten questions of the test. Hence, it was proved that it is impossible to state unambiguously that female university graduates prefer career to establishing a family. As the results show, there are statistically significant differences between the attitudes and preferences of female university graduates, depending on their field of study.

Apparently, cultural aspects will also play an important role, however, similar issues of the work-family balance and the status of women on the labour market is currently being dealt with worldwide (Amin, Arshad, & Ghani, 2017; Chen, Powell, & Cui, 2014; Chouat et al., 2013; Jin, Ford, & Chen, 2013; Faiz, Faiz, & Ahmer, 2016). There are differences in individual countries in the representation of individual types of women. The biggest number of family-oriented women is in Turkey (around 50 %), unlike in northern countries (less than 5 %). The Czech Republic has about 25% of women oriented towards family. Turkey also has the smallest number of women oriented towards career (less than 4 %), while career-oriented females occur significantly more frequently in northern countries (30 – 50 %). There are about 14% of career-oriented women in the Czech Republic (Weidnerová, Matějů, 2015).

In the early 1990s, five US universities conducted a survey looking into the expectations of young people related to their career, motherhood and marriage. 200 students formed a survey group regardless of gender and race. 16 years later, the same respondents were contacted again and asked to answer the questions related to their work career and family. The return rate of the questionnaire was nearly 78 %. Three groups were created: Have It All (mothers working full-time); traditional (mothers working part-time or not working at all) and only working women (no children, working full-time). Educational level had no influence on being integrated into any group (Hoffnung, & Williams, 2013).

Young people appreciate the importance of the decision to have children and they consider the consequences, particularly in the context of their work career (Berdahl, & Moon, 2013; Reynolds, & Johnson, 2012). Having children and how many is usually a question of mutual agreement. The ideal number of children

stated by the respondents is two. It was established that should a family decide to have a third child, it is usually a wish and preference of the woman (Jennings, & Pierotti, 2016). It was established in this investigation that the female social work students more often want to have 3 or more children.

Combining work and household duties is often appreciated as a conflicting situation. Similarly, social roles are in conflict as well (Protas, & Hyland, 2011), whereas these conflicts can often affect physical health (Boz, Martínez-Corts & Munduate, 2016). Success in a work career is positively influenced by the spouse's support (Amin, Arshad, & Ghani, 2017).

Respondents oriented towards family showed a positive relationship to satisfaction in life. No gender or age differences were found in this segment (Hirschi et al., 2016).

5 Conclusion

The main objective of this article was to establish the attitudes of female university graduates to motherhood and family life and to which extent they prefer career to family. This objective linked to surveys which concluded that the higher the achieved educational level, the greater the number of women oriented towards career than those oriented towards family and household.

In the question of what would their net monthly salary have to be to delay setting up a family, the female social work students gave statistically significantly different answers than female economics and management students. The percentage of female SW students who would never delay motherhood due to any size of salary is statistically significantly higher than in female students of economics and management.

The Mann-Whitney test proved that there is a statistically significant difference in students' preferences depending on the field of study. Female social work students significantly prefer family, while female economics and management students prefer career. The same finding was confirmed by the Wilcoxon signed-rank test comparing the importance of career or family. Female social work students find questions related to children and family very important and they mark questions related to professional career as less important. Female economics and management students show quite opposite preferences – profession and career questions were important for them, while questions related to children and family are ranked as less important.

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Primary Paper Section: A

Secondary Paper Section: AE, AN

PRACTICING INFORMATION SECURITY MANAGEMENT SYSTEM IN E-COMMERCE

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The research described in the paper was financially supported by the Slovak Grant Agency (VEGA) under grant No. 1/0436/17 and the Project of Young Teachers, Researchers and Full-time PhD. Students at University of Economics in Bratislava, No. I-18-102-00 Implementation of modern concepts in business logistics in Slovakia in the era of digital technology

Abstract: Doing business through e-commerce is now a common way of selling goods and services for any types of business organisation. However, many entrepreneurs do not sufficiently secure their e-business processes due to being unaware of the seriousness of threats that affect business information assets in cyberspace. Information security management system is not widely used in e-commerce businesses, thus leaving processes vulnerable against information security risks. This paper examines differences in the use of the system between e-commerce businesses that assess or do not assess the information security risks and verifies the effect of practicing this system on the information security level in the e-commerce businesses.

Keywords: information security, e-commerce, information security management system, information assets, risks

1 Introduction

From a global point of view, there is a constant increase in the entry of enterprises with various business subjects into the electronic market of goods and services. The reasons are clear: multiple market expansion, improved competitiveness and marketing, increased brand awareness of potential customers, an increase in orders and the associated increase in sales, etc. A country which recorded the most electronic sales of approximately 838 120 million € in 2016 is China. Followed by the United States (331 890 million €), the United Kingdom (139 120 million €) and Japan with a total turnover of 103 920 million € (Keith, 2015). In 2016, the total turnover from sales through online stores in Slovakia amounted to 900 million € (Dvorský, 2016), the Czech Republic reached 3 760 million € (APEK, 2017). Compared to the world leaders, the amounts are low, but the numbers are affected by the size of the country's population. E-commerce purchases are mostly made by UK citizens (2 140 € per inhabitant per year), the US citizens (1 024 €) and Japanese (824 €). In Slovakia, the population annually spends 166 € through e-shops, whereas the Czech citizens spend 356 €

Many start-ups and well-established enterprises are not aware of the fact that doing business in the electronic marketplace, which is part of the cyber space, always brings new, but different threats than the threats in the ordinary course of business. In unprepared enterprises, information security threats can easily be implemented in the form of security incidents. Such enterprises have little knowledge of the threats, security incidents, and lack advanced capabilities to secure their information assets, notably due to the unidentified need to address information security issues by the business management, but also due to a lack of financial and material resources, unskilled and inexperienced employees. These shortcomings are common in e-commerce enterprises. The offer of goods and services to customers on the internet, i.e. the introduction and active use of e-commerce, is undoubtedly a modern way of offering products. Securing internal or external threats, environments, devices, business processes, business secrets, supplier and customer relationships might be obsolete in today's businesses due to the continued and rapid development of ICT. Therefore, it is necessary to review and evaluate the current state of information security management in enterprises that conduct business activities in the electronic market.

2 Literature review

2.1 Information security management system

Information is an asset that must be properly protected in a growing and interconnected business environment (Said et al., 2013). Information security is a highly popular topic for enterprises as they process and classify a lot of information on daily basis, many of which is considered confidential. The enterprises want this information to be kept secret from uninterested persons for various reasons, because its loss, disclosure or loss can lead to a business crisis. Information security needs to be managed, ideally by creating the information security management system (ISMS).

Information is a crucial part of every enterprise. Acquisition, processing, storage and secrecy of information are among the most important activities of the enterprise's life (Kokles and Korček, 2015). To carry out such activities, it is necessary to take care of technical devices that serve to access information, to set up a system for handling the information carriers and to adhere to organizational principles for protection against damage. Information security is needed in relation to each interested party, such as customers, employees, business partners, suppliers, etc. Security deficiencies result from insufficient appreciation of the importance of information security management (Stehlíková and Horovčák, 2012). Within the development of ICT and competition, the protection of confidential information needs to be increasingly important because the ICT has become an instrument or subject of cybercrime (Kokles and Romanová, 2014). In the current highly globalized environment, it is imperative that businesses deal with the quality of products and services provided, as competition is not only for the domestic market but also for the world market. This is the reason why the company seeks to create a competitive advantage over other producers and service providers. Focusing on achieving high quality information means ensuring competitiveness over the long-term and stable, as the quality of the products and services as opposed to the price is immeasurable over time (Klátíková and Gubová, 2015).

By applying the system approach, it is possible to protect business assets against information security threats. ISMS deals with the issue in detail. Below are definitions from a variety of sources:

- STN ISO/IEC 27001 (2014) defines information security management as a system that "protects confidentiality, availability and integrity of information by introducing a risk management process and providing confidence to stakeholders that the risks are well managed",
- ESET (2014) considers ISMS to be the basis for managing security risks in order to establish, implement, operate, monitor, revise, maintain and improve information security in an organization,
- According to ENISA, information security management is a system that allows us to achieve the required qualitative characteristics of services offered by organizations, such as service availability, confidentiality and data integrity, etc. (ENISA a, 2015),
- Singh et al (2013) claim that ISMS is a system of balanced intersection of technical, managerial and human aspects of information security in an organization,
- Ondrák et al (2013) perceives ISMS as the effective and documented information asset management system that aims to eliminate their possible loss or damage.

According to the above definitions, we claim that ISMS is a comprehensive system that protects information from risks within the overall management system of an organization. At the same time, the information security management is not only about the introduction of technical measures, but especially

about the management, which is confirmed by ENISA (ENISA b, 2015). ISMS brings business continuity, competitiveness, profitability, prestige, elimination of threats and losses from realized risks.

2.2 Information security in e-commerce

In a typical e-commerce system where a customer visits websites, browses the product catalog and makes purchases, there are four main participants. The first is a customer who searches for a specific website via an internet browser. The website is usually run by a trader whose goal is to sell goods or services with a profit. Because the trader does not specialize in software development, he or she purchases the website from the provider. An attacker is the only illegitimate participant to whom exploitation of others brings benefits (Lokhande and Meshram, 2013). Using a variety of methods and techniques, the attacker attacks the customer, trader, communication, web server, network elements, and IT infrastructure of the provider. From another point of view, there are three vulnerable e-commerce points where security threats aim, such as the client, the server, and the mutual communication (Mohammadpourzarandi and Tamini, 2013). Laudon and Traver (2014) consider malware, potentially unwanted programs, phishing, unauthorized intrusion into the system, spam, identity theft, DoS and DDoS attacks, poorly secured server, client software, social networking problems, mobile devices and the cloud as the most common and the most harmful threats in e-commerce environments. We complete the list by other social engineering methods (e.g. pharming), remote computer spying, eavesdropping (e.g. man-in-the-middle attack), password attacks (guessing, resetting, capturing, rainbow tables, etc.), poor authentication, faulty security configuration of network devices, servers, clients and protocols, abuse of web application vulnerabilities, especially input validation (e.g. cache overflow, cross-site scripting, SQL injection) and many others (Lokhande and Meshram, 2013; PCI SSC, 2013). The success of electronic sales besides the uniqueness of a product, adequate price, a suitable system, the correct target group and marketing activities, largely depends on the ability to address threats by implementing appropriate security controls. The level of information security and the protection of business information assets is essential for an internet customer who is willing to provide personal data to the e-commerce and then buy products and services.

The use of the internet is growing rapidly every year, the availability of cheap mobile devices and the expansion of the internet have become key factors (Yazdanifard, Edres and Seyedi, 2011). E-business is developing directly in line with the expansion of the internet. Wherever the internet is available, new electronic markets are emerging. However, such development will not be possible unless enterprises adhere to basic dimensions of information security, or create a safe environment for their information assets. The main reason for possible bankruptcy is a customer because he or she is vulnerable to security incidents that are directed to e-commerce (Smith, Nah and Cheng, 2016). Any untreated and executed risk (e.g. leakage of login data) leads to immediate loss of reputation (Li, 2015), loss of the number of customers and thus to the existence of problems. At the current period of a large number of security threats, offensive methods and techniques, enterprises cannot afford to ignore information security. We claim that the right way for enterprises is to apply a procedural approach to ISMS that guarantees adequate information security for e-business by minimizing the consequences of risks by appropriate security measures at acceptable costs.

ISMS of e-commerce is a significant system that determines the health and sustainable development of an enterprise (Ji and Zou, 2016). Increasing cybercrime and its simplifying and availability to incompetent ICT users actively attack the information assets of enterprises with e-commerce systems, but from another point of view the enterprises are forced to apply proactive or reactive technical and organizational measures that ultimately lead to the implementation of ISMS. Based on the available knowledge, we agree with Netolická's (2012) and Král's (2011) statement that

enterprises trading on the Slovak electronic market lack a comprehensive information security management system. In the paper we examine whether the statement is correct and corresponds to the real situation.

3 Research objectives and methodology

The main objective of the paper is to review and evaluate the implementation of ISMS in e-commerce enterprises and its impact on the perception of the level of information security in the enterprises surveyed. In order to achieve the stated objective, we formulate the following hypothesis:

- H₀: The impact of the ISMS practice in an e-commerce enterprise on the enterprise's specified level of information security is not statistically significant,
- H₁: The impact of the ISMS practice in an e-commerce enterprise on the enterprise's specified level of information security is statistically significant.

The partial objective is to compare differences in the ISMS practice among enterprises that assess information risks and which do not assess such risks. The differences of groups are tested for statistical significance. The objectives of the paper are achieved using statistical methods and general methods of scientific work. When examining the structure of a data set, we used descriptive statistics and the Kolmogorov-Smirnov test (K-S test) to verify normal distribution of the data. When examining relations between variables in the case of normal distribution, an independent samples t-test was used (Hanák, 2016) and, in the case of other distributions, a nonparametric Mann-Whitney U test. The hypothesis was verified by linear regression.

The data were collected in the form of an electronic questionnaire in enterprises trading on the Slovak electronic market. The number of respondents was 91, which we consider to be a representative sample with respect to data sensitivity and the number of e-commerce enterprises that reached 9355 in 2015 with a year-on-year increase of 1105 (Heureka, 2015). The following table lists variables whose values enter the data analysis according to the set objectives.

Tab. 1 Research variables

ISMS. Information security management system	
ISMS1	The need for the information security management system in the respondent's e-business
ISMS2	Practicing the information security management system in the enterprise
ISMS3	Regularity of information security risk assessment
ISMS4	The level of information security specified in the enterprise

Source: Authors' own research

All continuous questionnaire variables (ISMS1, ISMS2, ISMS4) were measured on a scale of 0 to 100 points, where 0 points are the minimum and 100 points are the maximum. ISMS3 is a categorical variable measured on the ordinal scale. The following table shows a structure of the data set by main customers and business size.

Tab. 2 The dataset structure by main customers and business size

Main customers	Business size			Σ
	Microenterprises	SMEs	Large enterprises	
B2C	68,13 %	18,68 %	2,20 %	89,01 %
B2B	5,49 %	4,40 %	1,10 %	10,99 %
Σ	73,63 %	23,08 %	3,30 %	100,00%

Source: Authors' own research

Up to 89,01 % of e-commerce enterprises provide goods and services primarily to individuals (B2C), of which 68,13 % are microenterprises, 18,68 % are SMEs and 2,20 % are large enterprises. 10,99 % of enterprises surveyed are focused on B2B,

of which 5,49 % are microenterprises, 4,40 % are SMEs and 1,10 % are large enterprises. Other e-commerce models like B2G were not checked by respondents in the survey.

4 Results

The results of the data analysis are examined in order to determine the current state of ISMS in e-commerce enterprises. The descriptive statistics of the variables, except for the categorical variable (ISMS3), are listed in Table 3.

Tab. 3 Descriptive statistics of ISMS1, ISMS2 and ISMS4

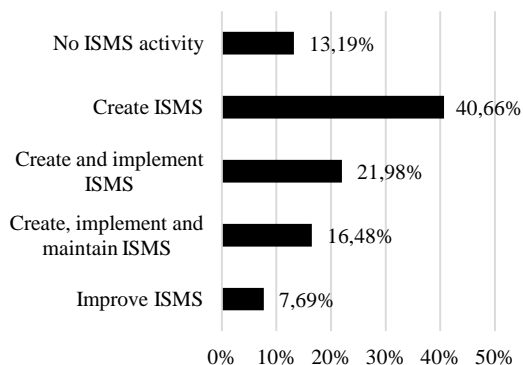
	N	Min	Max	Kurtosis	Skewness	Mode	Median	M	SD
ISMS1	91	1	100	-0,74	-0,41	100	60	61,26	29,33
ISMS2	91	0	100	-0,70	0,66	0	24	30,08	28,59
ISMS4	91	1	100	-0,68	-0,52	80	70	62,93	27,68

Source: Authors' own research

The ISMS1 variable measures the need to create, implement, maintain and continually improve ISMS in an e-commerce enterprise. We defined the scale from 0 (definitely not) to 100 points (certainly yes). 50 % of respondents rated this need for more or less than 60 points. The most frequently mentioned value was 100 points (15,38 % of respondents). On average, survey participants inclined to the need to improve the ISMS in their enterprise (M = 61,26; SD = 29,33). 75 % of respondents reported more than 46,5 points. The data are predominantly flat (-0,74) and right sloping (-0,41). According to the results of the K-S test at the significance level $\alpha = 0,05$, the data are normally distributed (Z = 0,89; p = 0,407). Therefore, we claim that the mean distribution value is between 55,16 and 67,37 points with 95% confidence.

ISMS2 follows in the survey and the variable examines whether enterprises are creating, implementing, maintaining, and improving the ISMS in their environment. The variable is specific because we categorized the values into four intervals that the respondents were familiar with. The values were divided into categories from 0 to 25 % (enterprises create ISMS), up to 50% (create and implement ISMS), up to 75 % (create, implement and maintain ISMS) and up to 100 % (improve ISMS). 0 % means that the enterprises do not perform any ISMS activity. Figure 1 shows the shares in the given categories.

Fig. 1 Share of enterprises practicing the ISMS



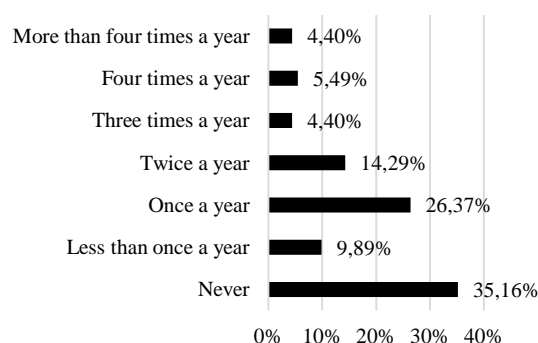
Source: Authors' own research

Most enterprises only create the information security management system (40,66 %), which is only in the initial phase. However, up to 13,19 % of enterprises do not operate in this area. Interestingly, 7,69 % of respondents already have the ISMS established and try to upgrade and improve this system. On average, enterprises reach M = 30,08 points; SD = 28,59 points. The data are skewed to smaller values (0,66) and are rather flat (-0,70). Up to 25 % of respondents reported a value of less than or equal to 2, meaning that these enterprises are not interested in the ISMS at all. The median represents only 24 points. 75 % of the values are up to 50 points. Overall, these data show that the enterprises do not initiate the ISMS and do not pay enough attention towards the ISMS. Since the data are not

distributed according to the normal distribution (K-S test; Z = 1,47; p = 0,018), the 95 % confidence interval of the mean value cannot be reliably determined.

Figure 2 shows the evaluation of the ISMS3 variable in the surveyed enterprises. Most enterprises do not rate information security risks at all, up to 35,16 %. Following are enterprises that assess risks once a year (26,37 %) and twice a year (14,29 %). In general, the more often enterprises deal with the risks, the more they are prepared for possible threats and information security incidents. In our opinion, enterprises should assess the information security risks at least once a year. The survey shows 54,95 % of such enterprises. However, this percentage is surprisingly high for Slovakia, but still low compared to the potential impact of possible information security risks.

Fig. 2 Regularity of the information security risk assessment



Source: Authors' own research

The ISMS4 variable measures the perceived level of information security in the enterprise. Respondents on a scale from 0 (minimum) to 100 points (maximum) rated the information security level in their enterprise. The median is M = 62,93 points; SD = 27,68 points. The information security level in e-business is at 62,93 %. The enterprises claim that their level is sufficient. Due to the current information security threats, the level should be much higher. The respondents most frequently rated the level of information security by 80 points and the median is 70 points. Only 25 % of enterprises reach the level of less than or equal to 47,50 points. The data are more flat than spiked (-0,68), sloping to the right (-0,52) and not normally distributed (K-S test; Z = 1,63; p = 0,006). The information security level values could be explained in two ways. Either the information security is really at the sufficient level and the results reflect the real situation, or the enterprises lack adequate education and security awareness, while the respondents believe that the information security level of the enterprise is good.

According to the analysis results of the ISMS variables we conclude that enterprises are inclined to the need to improve ISMS, the enterprises currently do not pay enough attention to the ISMS according to the ISMS2 average value, most enterprises are concerned with evaluating information security risks and the enterprises also claim that their level of information security is sufficient. However, there is still a large group of enterprises that does not assess the information security risks and does not perform any ISMS activity.

4.1 Comparison of variables depending on the risk assessment

In the subchapter, we verify the difference between enterprises which assess information security risks (N = 59) and which do not assess the risks (N = 32). The groups are compared with values of individual variables ISMS1, ISMS2 and ISMS4 while testing whether the difference of groups is statistically significant. In the previous chapters we divided the variables into those from normal distribution (ISMS1) and those that are not normally distributed (ISMS2, ISMS4). The variables meeting the condition of data distribution normality are tested by the

independent samples t-test with equality of variances. By non-parametric Mann-Whitney U test, we test the variables that do not meet the normal distribution condition.

The following tables provide an overview of only those variables where have been demonstrated the statistical significance of the examined differences (ISMS1 and ISMS2). Table 4 shows Levene's test results that indicate the statistically significant difference in group variances ($F = 4,97$; $p = 0,028$). Subsequently, the t-test confirms the statistically significant difference in the ISMS1 (the need for the ISMS in the respondent's e-business) rating, $t(49,70) = 2,23$; $p = 0,030$, among those enterprises which assess information security risks ($M = 66,64$, $SD = 25,13$) and which do not assess the risks ($M = 51,06$, $SD = 34,05$).

Tab. 4 Testing differences of the ISMS1 variable depending on the risk assessment

	Levene's Test for Equality of Variances	T-test for Equality of Means								
								95 % Confidence Interval of the Difference		
		Equal variances	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower
ISMS1	Assumed	4,97	0,028	2,44	89,00	0,017	15,30	6,27	2,84	27,76
	Not assumed	-	-	2,23	49,70	0,030	15,30	6,85	1,54	29,06

Source: Authors' own research

The results of the non-parametric test in Table 5 show that enterprises dealing with information risks significantly differ in the enterprise's ISMS practice ($p < 0,05$) from enterprises that do not deal with the risks. The differences of the ISMS4 variable are random ($p > 0,05$).

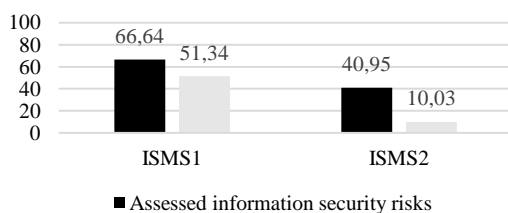
Tab. 5 Testing the differences of the ISMS2 variable depending on the risk assessment

Variable	Mann-Whitney U	Z	Asymp. Sig. (2-tailed)
ISMS2 Practicing the ISMS in the enterprise	328,00	-5,13	0,000

Source: Authors' own research

Figure 3 shows a summary of the surveyed variables with average values for each group with a statistically significant difference. Higher average values of variables are achieved in enterprises that assess information security risks. Differences between groups are evident and statistically significant according to the test results.

Fig. 3 Average values of groups in points with a statistically significant difference



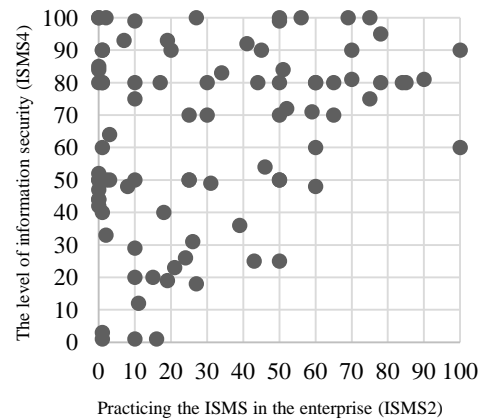
Source: Authors' own research

Enterprises that assess information security risks achieve a higher level of ISMS practice and emphasize the need for ISMS in their e-business more than enterprises that do not assess such risks.

4.2 Impact of practicing ISMS on the specified level of information security

By linear regression analysis, we verify the hypothesis whether the ISMS practice in the e-commerce enterprise (ISMS2) significantly affect the specified level of information security in that enterprise (ISMS4). We can observe a relationship of the variables in Figure 4, where the systematic linear dependence is not obvious, however, it cannot even be excluded.

Fig. 4 Correlation diagram of variables ISMS2 and ISMS4



Source: Authors' own research

The results of the regression are found in Table 6. The correlation coefficient ($R = 0,33$) demonstrates the weak interrelationship of the variables. The coefficient of determination ($R^2 = 0,11$) explains 11 % of variability of the dependent variable ISMS4 affected by the independent variable ISMS2. The remaining 89 % is influenced by other factors, such as investments in the ISMS, security controls, security training, incorporation of ISMS requirements into business processes, supply contracts, etc.

Tab. 6 Regression model of the dependent variable ISMS4 and the independent variable ISMS2

Model Summary (ISMS4)							
R	R Square	Adjusted R Square	Std. Error of the Estimate				
0,33	0,11	0,10	26,30				
ANOVA (ISMS4)							
	Sum of Squares	df	Mean Square	F	Sig.		
Regression	7397,66	1	7397,66	10,70	0,002		
Residual	61543,95	89	691,51	-	-		
Total	68941,60	90	-	-	-		
Coefficients (ISMS4)							
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
Constant	53,40	4,01	0,00	13,31	0,00	45,42	61,37
SY2	0,32	0,10	0,33	3,27	0,002	0,12	0,51

Source: Authors' own research

Analysis of variance (ANOVA) confirms a statistically significant linear regression model with a good data description, $F(1, 89) = 10,70$; $p = 0,002$. The regression coefficient $b_1 = 0,32$ significantly contributes to the prediction of the ISMS4 variable ($p = 0,002$). Based on the results obtained, we reject the hypothesis H_0 and at the level of significance $\alpha = 0,05$ we accept

the alternative hypothesis H_1 . The impact of the ISMS practice in an e-commerce enterprise on the enterprise's specified level of information security is statistically significant.

5 Discussion

The statement that enterprises in the Slovak electronic market lack a comprehensive system of information security management (Netolická, 2012; Král, 2011), was examined by the variable ISMS2. The results indicate ($M = 30,08$; $SD = 28,59$) that the statement is valid on our sample data. Up to 25 % of Slovak enterprises do not address the ISMS at all. It is clear from the data that the enterprises surveyed do not implement the ISMS, resp. only deal with the basic security measures. As a right path for enterprises, we propose a process application of the ISMS which will guarantee adequate information security of e-business. Only 8% of Slovak enterprises reach the advanced ISMS level. The remaining enterprises lack the comprehensive ISMS. However, according to the ISMS1 variable values, the respondents lean towards the need to improve the ISMS in their enterprise ($M = 61,26$, $SD = 29,33$). Up to 15,38 % of businesses are confident that the information security management system is needed. Therefore, the e-commerce enterprises are aware that practicing ISMS processes increases their information assets' security against risks, and at the same time increases the information security level in the enterprise. The fact that practicing the processes of such system has a statistically significant impact on increasing the information security level in the enterprise was proved by the results of the hypothesis verification.

6 Conclusion

We consider the information security management system a necessity for enterprises that want to successfully eliminate risks brought in by doing business in the electronic market. Businesses that use e-commerce to sell goods and services are particularly sensitive to customer trust. In the event of a successful security incident and subsequent disclose of this situation, a decline in customer trust may cause significant financial losses, mainly due to a decrease in orders. The ISMS as a comprehensive system within the overall e-business management can identify and eliminate information security risks in a timely manner. It is the ISMS processes' practice that increases the level of information security in the e-commerce enterprises. These enterprises consider the ISMS to be necessary, but they do not initiate the system. Enterprises that assess the information security risks practice the ISMS more and incline more towards the need for the ISMS in their e-business than enterprises that do not assess the risks at all.

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Primary Paper Section: A

Secondary Paper Section: AE, BC

CONCEPT OF ONLINE SUPPORT GROUPS AS KEY ASPECT OF PROFESSIONAL SUPPORT OFFERING FOR ONCOLOGY PATIENTS IN SOCIOONCOLOGY

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This article was written on behalf of scientific assignment Vega 1/0230/15 called „Social and personality traits of oncology patients as one of the most important factor in sociotherapy practice within this group of clients.“

Abstract: Theoretical part of this article describes the concept of on-line support groups as a key factor of complex oncological patients care in local conditions. This concept had been chosen and evaluated by means of statistically significant correlations of the group research. The results showed that the higher the score in personal factors such as "depression" and "nervousness", the higher the tendency of respondents to cope with critical situation (oncological disease) by means of searching for social support and search for positive situations. The goal of this contribution is based on partial outcomes of the group of authors research on coping with oncological disease by means of using coping strategies and personal characteristic traits of oncological patients. Furthermore, the goal is to link and connect important outcomes in an informative way and referring to relevancy of oncological social worker in the process that involves coping with oncological disease.

Keywords: Online Support Group, Cancer, Sociooncology

1 Introduction

The issue of civilization diseases is highly up-to-date in the 21st century, for the percentage of afflicted people is continually rising. Oncological disease is been classified as the disease of civilization. In spite of layman's ideas about cancer, professionals agree that it is serious, but not incurable disease. Solely the name of this illness - „cancer“ evokes very negative connotative meaning, it has therefore become societal taboo.

Even though the main focus in treating this disease is the medical help in order to issue acute intervention, more and more attempts to point out the spiritual, psychological and social aspects are resurfacing.

Social field is studying social health, which encompasses the topic of social support. More and more studies show results proving positive influence of social support among sick patients. In order to make social support effective, it is needed to create social web of high quality consisting of both environmental and professional aspects, or any social interaction available for the patient, such as support or self-help groups.

2 Social Support

The term social support is rather new, it can only be found in scientific literature in the past 25 years. 3 scholars played important role in its coining- Caplan (1974), doctor epidemiologist Cassel (1976) and psychiatrist Cobb (1976) (Mareš, 2002, p. 267). Koubeková (2001, p. 40) describes social support as „, a set of relationships, which one subjectively perceives as important in process of solving everyday hustles as well as difficult life events. It is help, support, coming from other people, which alleviate and ease negative consequences of burden and stress. Recent theories acknowledge direct influence on one's health status, even when not confronted with stress“. Mareš (2002) adds on fact that social support is, by all means, help which can even be provided by one's family members (parents, siblings etc.) or close friends (neighbours, classmates etc.) or professionals (teachers, psychologists, social workers or theologians). Individuals, groups, or whole societies can offer help. In order to make social support effective, it is needed to create social web of high quality consisting of both environmental and professional aspects, or any social interaction available for the patient, such as support or self-help groups

(Bačová, Žiaková, Katreniaková, 2015, Bačová, Žiaková, 2017). With that being said, it is not only important to choose suitable form of help, but to monitor its extent as well. It can only serve as effective help tool if these criteria are met (Cournoyer, 2013).

Professional social support for oncology patients can have these forms:

- cognitive support in form of educating the patient about important information involving his diagnosis specifically, while it also brings advice and social skills which can help patient in coping with the treatment process,
- emotional support focusing on sharing ones feelings in support group under supervision of trained coordinator,
- materialistic support in form of services or resources which can facilitate treatment process (such as nutrition plans, company while undergoing the procedures, household maintenance or baby-sitting) (Žiaková, 2005).

American association of oncology social workers (AOSW, 2012) in collaboration with World health organization recommend interaction of every functional part of the team in the context of bio-psycho-social functioning of oncology patient. This means that besides physician and clinical psychologist, social worker has a specific role as well. Social service offered by social worker shall be primarily focused on cognitive support, which could be done by individual, family and group counselling during whole treatment trajectory. This kind of intervention also offers supporting of optimal social functioning of the patient and his family, in order for them to become active decision makers during treatment process. Levická points out social functioning as key aspect in social work, because „, the core component of social work is to achieve highest life quality possible for individual and/or groups, by means of strengthening their overall functioning inside certain society (2007, p.19). Social worker in the field of oncology also provides counselling groups which are proven to lower anxiety, depression and nervousness.

2.1 Support groups for oncology patients

Mutual help and solidarity of people has its roots in ancient history of mankind. Healing potential of group has also been known for a very long time. Sick person, attending group session, does not carry his burden alone, he has potential to integrate into a group, in which he can observe means of mutual help and social support among its members.

Žiaková (2001) states that the term support groups encompasses several different entities linked by fact that their main function is mutual help, social support is implemented. Self -help groups, group counselling or traditional psychotherapy can all be considered to be type of social support.

In this article, authors are focusing on those support groups which are defined as patient groups, where professional with academic degree are leaders (such as oncologist, psychologist or social worker). The most ideal combination is when the leader is, or has been, in the position of patient himself (Žiaková, 2001). Therefore, it is not a traditional group therapy rather than systematic help offering by professionals from different fields. These groups are specific for their therapeutical process- patients often „open themselves up“. They compose of individuals carrying the same burden of health issues. Their aim is to help each other in mutual understanding of the situation they are in and in coping with problems linked with this situation. Family members can attend the sessions as well (Křivohlavý, 2002).

Žiaková (2001) states that offering support and psychotherapeutical groups is just as important as medical care, it is highly effective even with low budget. In these groups, common topics include their internal problems, fear of dying, loss, refusal and spiritual questions, marital problems, family

and colleague problems, change in quality of life, coping with other therapy effects, communication skills with other professionals, financial problems. These topics imply that treatment of cancer often brings problems with interpersonal relationships, therefore, it is highly important to point out positive effect of presence of such people in life of oncology patients, with whom they can share. Lots of experts highlight this fact, for without support group the quality of life of oncology patients would most certainly decrease.

People meeting in support groups talk to each other about their problems, burdens, about what makes them happy, what's going on with them, in them. Members offer each other feedback by talking about one's emotions, attitudes and thoughts about certain problem shared by group, and about what they state individually. Here, such group offers its members potential for personal growth by hearing other's thoughts, they can learn more and more about themselves, about the style of their communication and about their influence on others. Besides group members, these interactions are overseen by a leader. Uniqueness of such support group lies in its safety and non-judgmental atmosphere. What is being said in support group stays in support group and its members are not allowed to talk about it outside. Members get to know each other well, they build certain level of trust which leads to creation of more personal and deep and honest relationships. To become a member of such group can mean to get on journey of personal growth. The knowledge and support offered by experience inside such group can enrich one's life.

In this context, we present categories of terms related to social and emotional support:

- self-help groups- usually consists of patients with similar problems, who meet without professional leader and is led by one of the patients,
- support group- is a group of patients meeting with professional leader with academic knowledge such as oncologist or psychologist, who assist in leading the group's process. In this case, the best scenario is if the leader was or currently is in a position of patient himself,
- group work- leads to acquiring skills for coping with the situation, group is led by a leader in a position of teacher who focuses on solving the problem, such as coping with stress, assertiveness etc.,
- non-homogeneous groups- include work with information sources, sharing special scientific materials such as journals, or seminar organization in order to pursue specific goals, working on prevention of maladaptive behavior etc.

Křivohlavý (2002) presents bit different definition of groups offering social support:

- groups of mutual help- for example for patients with sclerosis multiplex, cancer, or diabetes,
- self-help groups- deal with people afflicted with similar disease, such as for nursing practitioners in care of Alzheimer's disease patients, or for parents of children with leukaemia, or for groups of widowed wives etc.,
- support groups- it is not classical psychotherapy group rather than systematic help offered for the patients by professionals from different fields (such as oncologists, psychologists...) these groups are exclusive and they usually involve opening one self "up" in front of others. These groups often last for a short period of time and they consist of patients inflicted with similar type of disease. Their aim is to help each other in clarifying the situation they found themselves in, in coping with it. family members can attend as well,
- since the 90ties, alternative forms of support groups have been emerging- such as online support groups.

2.2 Importance of online support groups for oncology patients

Modern days bring new aspects of simplifying our everyday life. Therefore, we think that it was only a question of time for other fields of science to evolve besides medicine, such as interactive communication in socio-psychological help. Currently, online support groups function in a very progressive manner, as an alternative form of help in coping with cancer, at every age (Tóthová, Žiaková, 2017).

Several authors (Cordella, Poiani, 2014; Barak, Boniel-Nissim, Suler, 2008; Dormann, White, 2001) talk about positive benefits of online support groups, i. e. time, geographical and financial availability. These groups are not limited by time. They are available 24/7 meaning that they are there for the patient at all times, he can express his emotions when they appear, when they are fresh. They are also available for people who can't travel in order to attend group session for different reasons (such as for health or finance related issues). Individuals can join from their comfy home, without issuing precise time of session which can sometimes be stressful for them. With growing availability of internet connection at households and work places, and with free access, online support groups can become attractive for everyone regardless age group and social status. It is only required to have basic knowledge about working with keyboard, computer or cell phone.

Under influence of information-technological advancement in communication options, with help of digital technologies (web), official communication tools are available in virtual manner, with help of social web sites or special cell phone applications. Online support groups can either be synchronous/ interactive/ or non-synchronous. The latter kind doesn't offer answer right away, communication participants are not present at all times (Thompson, Parrot, Nussbaum, 2011). On the other hand, this kind of online support bears several advantages- such as option to think for a longer time, save the communication, simpler access to social web creation, they inhibit maladaptive behavior, and last but not least- invisibility- because undergoing invasive treatment can leave traces on one's physical appearance. Non-synchronous communication tools include e-mail and moderated discussions (Suller, 2004). Synchronous kind goes on at a certain time period, meaning participants need to present at all times, even in a virtual way. Perk is immediate response. Video calls allow you to perceive non-verbal communication, mimics and voice. Such type includes group or individual chat rooms (Conversational Hypertext Access Technology - in short, chat), calls, video calls etc. (Barak, Boniel-Nissim, Suler, 2008).

There are several key differences between online and traditional support group, which oncology patients can find very appealing and motivational. Studies focusing on motivation to join online support group showed that men were looking for information regarding their diagnosis and treatment while women were more interested in sharing personal experience, by which they acquire emotional support, which they can't find in their environment (Cordella, Poiani, 2014). Mediated online discussions create safe space for taboo and sensitive topics. The best reinforcement can therefore be "better knowledge" about one's disease thanks to acquired support from group partners. Such positive advantage is noted in several stages. Medical knowledge has been domain for medical professionals, therefore, patients had access to such information only via their physicians. But nowadays, patients appreciate availability to search for their symptoms online as well (Heidelberger et. al., 2011, Mittal et. al., 2010, Starcevic, 2013). Browsing internet for health care options and "higher knowledge" about one's disease is the third most popular online activity (Timimi, 2012). Despite exchange of information is proven motivational factor, online support groups should not consider themselves to be main source of information, rather than another source of informative support.

Being a member of online support group leads to increased amount of social contacts and to lower degree of loneliness. Ineligible loneliness is one of the most important psychosocial

stressors oncology patient is faced with (Uden-Kraan et al., 2008). Cancer and death continue to be strongly interconnected terms in human mind, but it is not examined, it remains untouched by close friends and family members, for people have fear of invoking strong emotional reaction, because one has difficulties in bearing this pain. Because of that, many relationships change right after being diagnosed, since the process of coping with reality is overwhelming and difficult at all times for the patient himself as well as for his family and friends (Cordella, Poiani, 2014). Members of online support groups, although remaining anonymous, are allowed to thusly form deeper, more intimate and honest relationships, since they share similar life experience. Group coherence and trust evolve from the feeling of safety. Its uniqueness also lies in non-judgmental atmosphere (Chung, 2013). In moderated communication via texting, synchronous or non-synchronous disinhibiting effect can occur, its negative influence appears in ways of inadequate loss of restraint in social communication - flaming (Horská, Lásková, Ptáček, 2010). The disinhibiting effect also has some advantages, because patient learns to open to the others more easily, because it lowers pressure on his self-presentation, primal fear of contact is being eliminated. Some members can leave the group in non-synchronous type of communication in case the messages they receive are too personal, emotional or hostile. The sense of freedom by having the option to leave and then come back at any time can lead to better emotional regulation (Barak, Boniel-Nissim, Suler, 2008).

Online support groups also allow its members to present themselves by sharing their self-presentation in creative way. Therapeutic effect of writing about ones thoughts and feelings can decrease depression and loneliness as well as pain and stress. From this point of view, these groups have greater advantage in comparison with traditional support groups (Dormann, White, 2001). Based on qualitative analysis results, Buchanan and Coulson (2007) came to conclusion that online support groups are ideal platform for searching for approval. Accepting information coming from members with whom the patient can identify is much easier than coming from any other source. Besides that, individual stories can serve as positive stimulus in coping process. On the other hand, there is serious disadvantage - count of members in one group can reach so high reading every single message might require time engagement from its members.

Yet another advantage is the possibility for family members and friends to become part of the group themselves, by which they can gain understanding and compassion, different point of view on the problems oncology patients have to face, without interfering with the general group process (Cordella, Poiani, 2014). Overall, perks of joining online support group lead to higher quality of life, better decision making skills (Braithwaite in: Dormann, White, 2001). They conclude these groups offer holistic and cooperative approach for reaching ones goals and special needs, which, in essence, brings sense of strengthened will, better coping and stress reduction in the process of both coping with the illness and rejoining community. Usage of communication social webpages has been proven to be effective tool in strengthening emotional support in group of oncology patients (Beaudoin, Tao, 2007, Walther, 2005).

3 Examples of successful practice from Slovakia and abroad

Following text deals with functional and reliable examples from practice.

Based on web search of Slovak and Czech pages, after typing in keyword "support groups for oncology patients", we have chosen most well-known and relevant examples of this service for oncology patients and their family members. In Czech republic, the most famous portal is Czech oncological society, which is focused on broad society at www.Linkos.cz. It contains information about oncological disease of adults, children, their treatment and prevention, but solely psychooncology counselling. National oncological online programme is yet another very appealing portal offering centralized and

professionally granted information (www.onconet.cz). Oncology patient is Slovak portal for psychological counselling for the patient and his family. It contains lots of information about different diagnosis and its treatment while offering non-synchronous kind of support (e-mail). Archangelos focuses on groups of senior oncology patients. Meetings deal with free discussion under professional leadership as well as autogenous training and arttherapy (archangelos.sk). League against cancer in Slovakia offers a view into attempts to accumulate information about complex healthcare for oncology patients. Among its many activities, it is possible to find distant counselling with professionals from oncology, psychology and social work via non-synchronous (e-mail) and synchronous (mobile) ways. Charge-free telephonic line is available according to duty schedule found online.

Based on mapping worldwide web, we hereby present certain web pages, where patient can find support via hospitals, social services, and non-beneficial groups used by other patients (such as Mylifeonline.org, 4th Angel Mentoring Program, My cancer circle, Caring Bridge, MEDHELP..). MEDHELP is social platform offering space for support groups in the presence of doctors. Site presents clinical studies, news, individual help tools a chat rooms. Its creation can be dated to year 1994. Currently, it has more than million users and hundreds of communities of patients with different diagnoses. The most active members (treated oncology patients) offer their personal stories, ideas about best ways to cope with the disease and they are positive example for other, not yet cured patients. Positive empathic interactions among group members include self-disclosure. (medhelp.org.)

MyLifeLine.org is programme with online support group for oncology patients belonging to non-governmental organization American Cancer Society originated in the USA. Based on their own research, they conclude emotional support and strong affiliation could be helpful for patients and their families. It is charge-free social web page offering oncology patients option to create their own personalized online community of support. Family, friends and care takers might join as well. Results from study of American Cancer Society from 2015 prove more than 23000 active participants. According to demographic data, 75% active users are women and 25 % men. 50 % of these patients are currently undergoing their treatment, 33% haven't even begun, 8% was done and 3% had interrupted their treatment (www.mylifeline.org). MyLifeLine.org comes as important tool for oncology patients, since it can ease their process of coping with emotionally and physically difficult treatment. After creating their personal account it is possible to:

- Share news. Patients can update their treatment progress via photos and videos for other patients to see;
- Add facilitator- coordinator of care. Therefore, the group would be professionally supervised. Members can choose their preferred leader;
- Find help coordinates- oncology patients need help with their nutrition plans, travelling, baby sitting or household jobs. Hereby, professionally trained volunteers can be requested to help;
- Online calendar is helpful in maintaining overview of treatment schedule. It can be shared with other members, which can ease finding needed help;
- Receiving and sharing present emotions and thoughts, motivational quotes etc., supervised by coordinator;
- Controlling your privacy. Member can invite those people with whom he wants to share his path, otherwise he can configure his privacy for stronger sense of safety;
- Other information regarding cancer diagnose. Right to be informed is one of the basic rights of any patient (about his diagnose, its treatment, prognosis, risks etc.) (mylifeline.org).

In previous part of this article, authors focused on demonstration of eligibility of social support as an important coping strategy in burdening situation. Based on various study results and practice, it is possible to conclude that face-to-face support groups are

more preferred in our country, online groups remain absent. Nevertheless, searching for social support is very important addition to medical care for oncology patients. Social workers should focus on professional help for these patients from the moment of being diagnosed right to the moment they begin to live with the disease as chronic. In this context, professional social support should represent easy-to-maintain form of social support, it shouldn't function solely in a form of crisis intervention nor as mean of secondary prevention leading to strengthening positive habits adapted during treatment. Base of every support group is support, trust and sense of safety. All the beneficial agents in burdening life event, which diagnose of cancer definitely is. Based on these findings, authors decided to link social support with oncological disease. These group of patients require emotional support at most, since it is proven to decrease anxiety, depression, which in the end leads to stronger immune system, thereby accelerate treatment. During this life event, individual is not only struggling with changes in physical appearance, but with decreased psychological well-being as well.

3.1 Sample description

Following parts of this article focus on linking the two concepts together- social support in terms of online support groups as key aspect of complex care of oncology patients with chosen study results showing need for social support to be an important coping strategy in burdening situations in relationship with personality traits of oncology patients.

193 (64,9 %) women and 104 (35,1%) men diagnosed with cancer agreed to participate in our research. This sample was acquired after an understanding with Eastern-Slovak institute for oncological diseases and ethical commission during January – June 2016. Intentional and non-randomized sample was used. 48% respondents is currently undergoing treatment and 52% respondents were already done. 19,3% respondents have been done with their treatment for 5 years. Mean age was 58,6 years with standard deviation 11,9. 198 (66%) respondents live in a marital relationship.

Using descriptive statistics, our sample can be specified according to year when they were diagnosed (Chart1). For better visualization, intervals of 5 years have been created with exception of borderline years represented by two respondents diagnosed in 1988 and two respondents in 2016. In Chart 1, we can see that most of our research sample was diagnosed in timeline of 2011-2015.

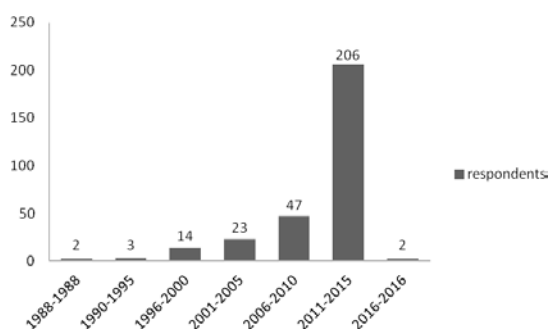


Chart 1 Sample description according to year of receiving the diagnose

Based on acquired academic education (Chart2) 21 (7%) respondents had elementary school education, 62 (21%) respondents had high school education without graduation, 154 (52%) respondents had high school education with graduation. 61 (20%) respondents had college education.

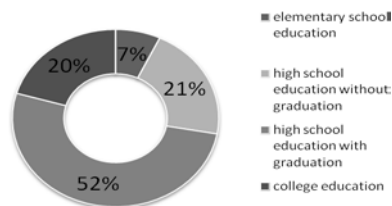


Chart 2 Sample description according to level of acquired education

Questionnaire battery composed for this study did not only focus on demographic data, but it measured preferential coping strategies via SVF 78 (Stressverarbeitungsfragebogen), which focuses on individualistic tendency to employ different coping strategy. It is shortened version of SVF 120 from authors Janke and Erdmann (2002), adapted in Czech by Švancara in 2003 (Janke, Erdmann, 2003). This questionnaire was validated in Slovakia by Halachová and Žiaková (2016) on sample of 694 respondents. It consists of 78 items describing different ways to react when confronted with distress. Respondent answers on Lickert scale (0- never, 1- almost never, 2- maybe, 3- possibly, 4- very possible). This scale is used to represent the extent of one's reactions in real life conditions. It results in 13 factors divided into positive (effective) strategies leading to stress reduction such as- under estimation, guilt refusal, diversion, alternate gratification, situation control, reaction control, positive self-instruction. On the other hand, negative (non-effective) strategies lead to stress rise- escape tendencies, perseveration, resignation, self-blaming. Strategies which can be defined in either group are need for social support and avoidance. Reliability equals Cronbach's alpha= 0,80. Personality traits were measured via Freiburg personality questionnaire by Fahrenberg, Selg, Hampe, who begun it's creation in 1963. In 1984, it was adapted to Slovak language by Kollárik, Poliaková and Ritomský with sample of 2582 respondents. Respondent has to agree or disagree with presented 114 items. It measures nervousness, depressivity, excitability, sociability, calmness, reactive aggression, continence, openness. 3 accessory scales have been added due to analysis: extraversion-introversion, emotional stability-lability, masculinity-feminity. Inner consistence was between 0,74-0,87. For interconnecting purposes, descriptive statistics have been used as well. Need for social support and its contexts has been calculated using Spearman's correlation coefficient.

3.2 Chosen study results

We were interested in any possible connection between need for social support and other coping strategies. Secondly, we managed to measure potential connection between need for social support and personality traits.

Firstly, Chart 3 represents preferential coping strategies of oncology patients (N= 297) as seen in SVF 78.

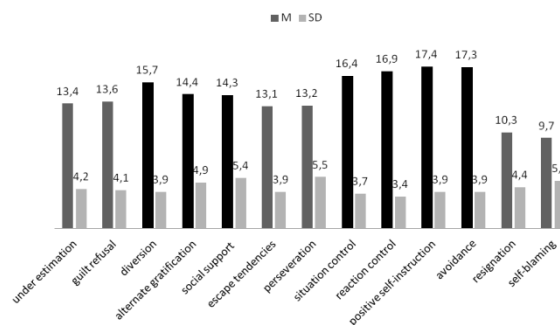


Chart 3 Description of coping strategies constellation

This description offers clear information about measured mean scores and standard deviation for each strategy. Based on mean score border assigned for each strategy ($x=14,1$), it is possible to divide strategies into 2 groups. The higher the score than border score ($x=14,1$), the more the strategy is used. Overlooking the results, it is possible to conclude that patients in this study sample preferred effective strategies. For specific uses of this study, we focused on social support since it's obviously very important in sample of oncology patients. This strategy has been found to be highly preferential as well ($x=14,3$). Need for social support is defined by authors of the questionnaire (Janke, Erdmann, 2003) as a tendency to form new contacts when confronted with stress, receive some support in problem solving process. Table 1 presents correlation constellation between coping strategies acquired in our sample.

Table 1 Spearman's correlation coefficient- connection between need for social support and dimensions of personality traits.

	NEED FOR SOCIAL SUPPORT	
	r	p (α)
<i>NERVOUSNESS</i>	0,249**	<0,001
<i>DEPRESSIVITY</i>	0,207**	<0,001
<i>EXCITABILITY</i>	0,201**	<0,001
<i>SOCIABILITY</i>	0,000	0,999
<i>CALMNESS</i>	-0,039	0,504
<i>REACTIVE AGGRESSION</i>	0,127**	0,028
<i>CONTINENCE</i>	0,172**	0,003
<i>OPENNESS</i>	0,119*	0,04

** p (α) <0,01

*** p (α) <0,001

We found statistically significant connection between need for social support and personality traits besides Sociability and Calmness. Weak positive relationship has been found between need for social support and Reactive aggression, Openness, Continenence. It is therefore possible to conclude that even though these patients sometimes feel shame and difficulties in establishing new relationships (Continenence) they still wish to have some social support. Also, the more they act egocentrically and think authoritatively (Reactive aggression), the more they feel need for social support.

On the other hand, even if they act in self-criticizing manner and display lightheadedness (Openness) they still feel need for social support. Positive but much stronger relationship has been found between Nervousness, Depressivity, Excitability. The more our respondents act like tired, burnt-out, grumpy (nervousness), they underestimate themselves, display aggression against themselves, feel guilt and unstable mood (Depressivity), have lower frustration tolerance, act impulsively (excitability), the more they wish to establish strong social web offering social support.

Table 2 Spearman's correlation coefficient- connection between need for social support and chosen coping strategies

	NEED FOR SOCIAL SUPPORT	
	r	p (α)
<i>Diversion</i>	0,275**	<0,001
<i>Avoidance</i>	0,234**	<0,001
<i>Positive self-instructing</i>	0,186**	<0,001
<i>Alternate gratification</i>	0,486**	<0,001
<i>Reaction control</i>	0,253**	<0,001
<i>Situation control</i>	0,329**	<0,001
<i>Resignation</i>	0,343**	<0,001
<i>Escape tendency</i>	0,501**	<0,001
<i>Perseveration</i>	0,439**	<0,001
<i>Guilt refusal</i>	0,139*	0,017
<i>Self-blaming</i>	0,316**	<0,001

** p (α) <0,01

*** p (α) <0,001

Statistically significant relationship has been found between Need for social support and other strategies, at least in weak positive correlation. Medium strong positive correlation was between Need for social support and Alternate gratification, Situation control, Resignation, Escape tendencies, Perseveration, Self-blaming, which we will discuss. It is possible to summarize tendencies preferred by oncology patients- the more they prefer escape tendencies, they feel helpless (Resignation), they tend to analyze their situation (Situation control), they tend to ruminate (Perseveration), they ascribe their difficulties to their own wrong conduct (Self-blaming), or they prefer engaging into more positive activities/situations (Alternate gratification)- the more they need help and social support when confronted with burden.

4 Discussion

Based on chosen study results (as seen in table 1 and Table 2), it is possible to conclude relationship between need for social support and engaging in positive coping strategies- the more one feels need for being with others, receive support, the more he engages in positive activities (such as alternate gratification). For clarification, the more an individual reacts to burdening situation in a manner of self-care, such as watching favorite movie or buy stuff he was postponing, the more they try to ask other people for help in their difficult situation, they need someone else's opinion as well. It seems they tend to seek support from others via activities which bring short term sense of freedom, but in the end, they need social support to cover their need to belong somewhere, be a part of something, have faith. In this context, Berkman and Glass (2000) offer several thesis about connection between social web and health. The most outstanding is the thought of social web pages functioning as buffering factor when confronted with distress, therefore, they could influence one's health status. Participating in different social activities brings opportunity to learn new skills, it bring sense of fellowship in certain group. This means that social activities could influence one's health in direct and indirect ways- directly, it stimulates one's cognitive functioning, indirectly, it gives sense of fellowship and advisability. When these needs are ignored, one can be faced with feelings of purposeless, which could lead to searching of other, alternate sources of joy, sometimes even through various dangerous activities, social deviations (Lichner, Šlosár, 2014).

We can understand social support to be one extreme dimensional pole, whereas the other is social isolation, feelings of loneliness, even ostracization by society. Cancer and death are two terms which didn't seize to be interconnected in one's mind, therefore, this topic usually remains closed for fear of intense emotional reactions it can lead to. Because of that, this diagnose has obvious impact on relationships. They either become better-more intensive and caring, or they get worse, but never remain the same. Adjusting to new reality is a process emotionally overwhelming for the patient himself and for his family and surroundings as well, at every stage of treatment (Spiegel, Classe, 2000).

Study results acquired by authors prove the existence of connection between feelings of helplessness and need for social support- the more patients feel helpless, the more they seek social support, and avoid distress. We can assume the more one tries to control and solve the problem (reaction control, situation control), the more he needs to assure himself quality web of social support. The more they try to tell themselves "I must pick myself up, dust myself off", the more they suppress their agitation, maintain down-to-Earth thinking, the more they need someone else's opinion, help, suggestion, talk to someone. It becomes obvious that support groups are extremely important for oncology patients, they make space for sharing one's emotions, searching for some understanding. Currently, social support is considered to be one of the most important social factors contributing to one's overall health status. Grav et. al. (2012) working with 40 659 respondents found higher depression incidence among people who lack social support. They also pointed out higher need for emotional support in women, whereas men tend to search for instrumental help.

Feelings of depression, nervousness, escape tendencies are all connected with need for social support. In the context of coping with burdening life events, depressive feelings and escape tendencies have been found increased need for sharing one's problem with other people

5 Limits

We consider our sample size to be the biggest limit of our study. Because of this, we don't suggest to generalize our findings to whole Slovak population.

6 Conclusion

Results show that need for social support is higher in group of respondents who tend to think and feel more negatively, which can be characterized by dimensions of "Depressivity", "Nervousness", "Reactive aggression", "Excitability" etc. Underlying our findings as well as theoretical background presented in upper parts of this article, we conclude that oncological disease is highly burdening life event, which symbolizes psychological distress which can't be handled by patients alone, therefore, they need social support. We consider this finding to be serious enough to demonstrate need for online support groups as an element of social support at difficult times. Health care professionals should inform their patients about this possibility, as well as about its positive influence.

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Primary Paper Section: A

Secondary Paper Section: AN

SELECTED THEORETICAL APPROACHES AND THE BASIS FOR HOMELESSNESS CURRENTLY

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Abstract: When examining homelessness issues, it is important to pay due attention to the theoretical and methodological analysis, characterized by definition, causes of origin, course, consequences, as well as linking and linking homelessness with other sociopathological phenomena. In the framework of this paper, we analyze selected theoretical reflections and approaches leading to the definition of homelessness while also looking at the benefits of the historically first census of people living without a home in the Slovak Republic, which was implemented in 2011 through Population and Housing Censuses.

Keywords: Homelessness, Theoretical background, ETHOS, Census of the homeless, The Slovak Republic

1 Introduction

Losing one's home and homelessness¹ can be described as a significant global problem, affecting not only the most advanced countries in the world but also developing countries (Obuobi, 2015).

At the same time, homelessness represents in its sophisticated form a multidimensional, socially undesirable phenomenon whose causes, course and consequences are also closely associated with a range of other social phenomena, especially with poverty and social exclusion (Žilová, 2014).

According to Fitzpatrick, Bramley, and Johnsen (2012), we can say about homelessness as an extreme form of social exclusion that has profound implications for a person affected by homelessness but also for the whole of society. Under homelessness, this is not only a social-pathological phenomenon but also a process associated with a dynamic course, not only the causes of its origin but also the course and consequences of its duration. In this context, it can be characterized not only as a social but also as a life crisis, affecting all dimensions of the individual's life (Foscarinis, 2012).

Schavel and Oláh (2010), by the essence of homelessness and its expressions, include a target group of homeless people in a group of marginalized groups.

2 The formulation of the issue

Although homelessness and its associated persons living within the public space do not represent a modern phenomenon in society, different definitions have been applied in the attempt to define homelessness for a long time (Brändle, Garcia, 2015). We are therefore focusing on the international organization FEANTSA, which focuses on homelessness in the long run, and has attempted to present a theoretical concept of defining homelessness, taking into account the many features and expressions associated with the problem.

In this context, FEANTSA joined the ETHOS concept in 2002, framing and defining homelessness initially within the four basic conceptual categories (no shelter / flat, no housing, inadequate housing and precarious housing), and the areas creating a home, and where homeless people are excluded to varying degrees. These areas included the physical, social and legal spheres. The original concept of ETHOS was thus modified in 2004 to include seven general categories of homelessness and housing exclusion, which were also the result of linking the original four conceptual

categories, in conjunction with the three areas that characterize the home (Lorenc, Ondrušová, 2015).

Lorenc and Ondrušová (2015) further point out that there was an annual review of the ETHOS typology between 2004 and 2006 through the European Homelessness Observatory, by national surveys of national homelessness statistics from the individual Member States. It was also characteristic for the period that the four basic concepts of the ETHOS typology were developed into thirteen operational categories (including the specification of 24 life situations, their use for different public policy purposes). Later on, most of the EU Member States started to use the Harmonized Definition of ETHOS light (the condition of its compatibility with the UNECE and Eurostat recommendations, given the population census in the EU, which was implemented in the Member States in 2011). It was a shortened equivalent of the ETHOS typology (focusing on conceptual categories of people without shelter and homeless people), which was also used in the 2007 European Commission Study on Homelessness Measurement.

From homeless typology, it is also important to pay attention to the applied standard of living that is not the same within the homeless subculture. In the context of the standard of living standards Kadlečík (2013) recognizes three groups of homeless people:

- a) the first group of persons can be characterized as visible homeless because the persons concerned publicly declare the status of homeless people. A preferred standard of living is usually meager, accompanied by poor hygiene and care for appearance, poor health, apathy, as well as no or only minimal motivation to improve their unfavorable life situation. The given group of people acquire the means for their survival, mainly by selling secondary raw materials and beauties, with the feature being the use of social services of the low-threshold offer;
- b) the second group consists of middle-aged people. Persons belonging to this group did not lose their hope for re-socialization and motivation to change their situation, despite their long-term residence on the street, while hygiene, health or welfare is higher than those included in the first group. From the use of social services, it is essential to mention the preference of higher-threshold social services (shelters, hostels) as well as the priority interest in securing the client's living needs;
- c) the third group consists of persons with a preferred higher standard of living, living without a home in a shorter time horizon, or in connection with a repeated loss of home in shorter time horizons. A characteristic feature of this group is the high degree of motivation to change the existing situation, the high interest in obtaining affordable housing and maintaining employment, which also emphasizes the keeping hygiene and the external appearance of these people in front of the public, declaring their interest in reintegration into society.

In the process of re-social inclusion, it is important to note the length of stay in the street, which, according to Kuhlman (1994), has a decisive impact on a triumphant return to society. In this context, the phases of formation, respectively, duration of homelessness may vary.

Habánik (2016) states a breakdown, consisting of the following stages:

- 1) *the first stage* - at this initial stage, the person who has lost their home is trying to act so as not to exaggerate the impression of the homeless before the public eye. The result is the non-acceptance or non-admission of their new social status, the active search for help, the maintenance of cleanliness and a decent appearance;

¹ The essence of the home is not only a living space, but also a non-material, deeper aspect, necessary for the life of man as a social creature.

- 2) *the second stage* - we can call it a regression - a situation where the individual does not succeed during the first stage of finding suitable ways to solve his social situation. The absence of an address, residence, and security imply that any administrative action is a complex and almost insurmountable problem for individuals. At this stage, a homeless person gets into a state where he/she loses self-esteem, stops looking after his / her appearance and mood, and stops gradually having an interest in improving his / her situation;
- 3) *the third stage* - regression is gradually replaced by resignation to a lifetime, including family, friends, and acquaintances. At this stage, existing social bonds are extinguished, apathy is coming to the forefront, and the total lack of concern for the future. The person at this stage is not interested in the solutions offered, but he wholeheartedly agrees with his destiny and openly accepts the status of the homeless.

Given the ETHOS typology, we further state that due to the multidimensional nature of a universal and general scheme of homelessness, it is possible to encounter a variety of factors and causes that lead to homelessness.

Ondrejko (2009) confirms this view, adding that the phenomenon of homelessness has its roots in poverty and other accompanying factors, but under the very emergence of homelessness can also sign biological determinants presenting the reasons for real homelessness:

- a) *volunteerism* - Homelessness is often presented as a lifestyle expression of members of the homeless subculture, whose members not only practice but also voluntarily choose it. From choice, there is, therefore, the view that even homeless people themselves are responsible for the emergence of their homelessness (the opinion of uninterested persons);
- b) *defects and pathologies* - homeless can be characterized as persons who are affected by one or more defects on a functional basis. Whereas in the past a person who is not home is considered a person unable to integrate into society, it is currently possible to assume that in a person suffering from at least one defect in the pathology set there is a presumption that the person will not be able to take proper care of himself and the risk of homelessness is so greater;
- c) *the inadequate family support* that has a significant impact on why people are losing their homes or why they are unable to reintegrate with their family (family absence, family dysfunction, perceiving the individual as a family victim, and others);
- d) *unfortunateness* as an initial or ending impulse that affects the emergence of homelessness.

According to Fitzpatrick, Kemp, and Klinker (2000), in the second half of the 20th century, in the territory of Western Europe, the public could meet two theoretical concepts arguing about the emergence of homelessness in society. The causes were structural and individual. An important fact, however, was that both the theoretical concepts and the homeless debate in society were presented not only by state representatives but also by social workers working in the field with homeless people as well as by non-governmental organizations working in the third sector. This expert exchange of views was able to draw the attention of the public who subsequently started to address this issue, influencing how social work was done towards this target population.

Due to the circumstances, Marek, Strnad, and Hotovcová (2012) also offer the following causes of homelessness within the public space:

- a) *primary* - the individual is aware of the causes of his or her loss of home, social deprivation and acceptance of the status of a person living on the street;
- b) *secondary*- under the influence of social bankruptcy, the process of psychic decline of the personality follows; an

individual knows why he is on the street, but he does not think about how to handle this situation;

- c) *tertiary* - if an individual realizes that existing barriers in the process of his re-social inclusion can overcome and undertake this process, but unsuccessful, there may be a situation that he can not integrate into society and is unable to find a place in it. The result is a permanent return to the street and the resultant final resignation of his life.

3 The theoretical background of homelessness in the Slovak Republic

The conditions of the Slovak Republic mean that the problem of homelessness is long drawn out of the focus of the state and the majority public attention. In this context, we are dealing with significant deficits regarding examining the issue, as well as the lack of a framework of measures implemented, to resolve, alleviate and possibly prevent homelessness. In Slovakia, we meet not only the lack of legislation on homelessness but also the ineffective distribution and distribution of social services² that can not be reflected in the real numbers of homeless people, including the street work method, as the critical method of capturing a given spectrum of clients (Habánik, 2016).

We consider the absence of a National Strategy that includes effective procedures and solutions in the process of eliminating homelessness, in conjunction with the lack of homelessness models at the level of individual regions (as well as not paying enough attention to marginalized populations, including not only homeless, but also drug addicts, segregated Roma communities, etc.). In this regard, we note that it is very complicated to thoroughly map and accurately determine the number of people living without a home. In particular, the group of potential homeless people is vast because, according to economic indicators, the still significant share of the population is at the border, respectively. Below the poverty line (based on indicators of the minimum subsistence minimum as a socially recognized minimum income limit for a natural person)³.

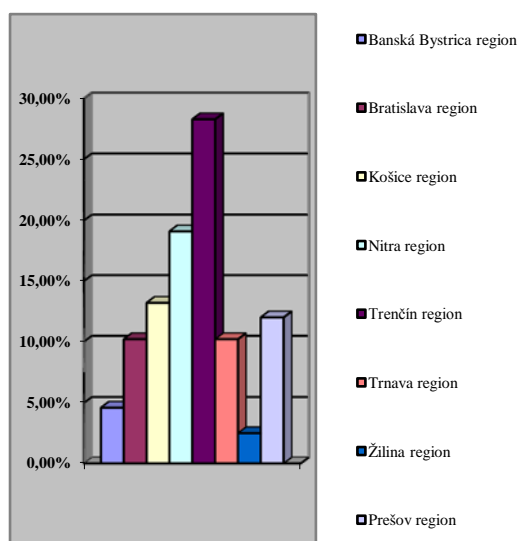
Gerbery (2015) notes further that at the OECD level it is estimated by calculation that regarding productive population, one in a thousand people are 1-8 people living without a home. In this context, we also point out an inevitable shift in SR conditions, as in 2011 Population, Housing and Homeland Census took place, and for the first time, it was also attempted to map the size of the group of people living without a home. In this case, the secondary category of homelessness was applied by which the survey commissioners looked at the size of the population consisting of people living outside the dwelling of the housing stock as well as using collective accommodation of a temporary nature (as defined by Act No. 448/2008 Coll. social services) or residing in a fictitious house without a shelter.

Given that the census methodology provided that each person is formally counted within a particular flat or house, the legendary house item was applied in case the investigated person did not live in the house or the apartment. This methodology has created a space for backgrounds serving as a group of homeless people. Results Population and housing censuses finally showed that up to 23 483 people could be characterized as living without a permanent home, with a dominant male representation (up to 61.4%) (Ivančíková, Škápik, 2015).

² Kamanová (2016) explains that the nature of social services is focused on solving, mitigating, or preventing the emergence of an unfavorable social situation, disrupting the social independence of an individual, family or community.

³ By failing to reach the minimum of life, one finds himself in a state of material need. A more detailed status as well as the possibility of assistance is defined by Act no. 417/2013 Coll. on Assistance in Material Need and on Amendments to Certain Acts.

Figure 1: Proportion of homeless regarding the occurrence in individual regions of the SR



Source: Gerbery, 2015, author's own processing

Table 1: Number of homeless people on the basis of sex and region

Region	Men	Women	Total
Banská Bystrica region	621	451	1 072
Bratislava region	1 289	1 107	2 396
Košice region	1 740	1 356	3 096
Nitra region	2 701	1 172	4 473
Prešov region	1 720	1 107	2 827
Trenčín region	4 380	2 258	6 638
Trnava region	1 570	831	2 401
Žilina region	385	195	580
Total	14 106	9 077	23 483

Source: Gerbery, 2015

4 Conclusion

The problem of homelessness has been developed in modern society as the current challenge, the consequences of which are perceptible at the level of the whole society. With its multidimensionality, homelessness represents a specific social phenomenon, touching and affecting other social phenomena. Multivariate itself is specific to a wide range of existing approaches to exploring the phenomenon from different angles. An attempt to present the definition of ETHOS, in synergy with the support of the census of homeless people, can be a significant step in the process of looking not only for long-term but especially effective ways of solving homelessness even in the conditions of the Slovak Republic.

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Primary Paper Section: A

Secondary Paper Section: AO

IMPULSIVITY AND AGGRESSION IN THE SYSTEM LOWER SECONDARY EDUCATION IN SLOVAK AND CZECH REPUBLIC

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Paper is published within the frame of the projects: 1) VEGA 1/0122/17 Risk behavior and attachment of the adolescents aged from 10 to 15.; 2) IGA_FF2017_001 – Diagnostika místa kontroly (locus of control) a jeho využití při práci s adolescenty ve věku 11-15 let (běžná populace, klienti NZDM).

Abstract: Our research design is based on the assumption that impulsivity and aggression are closely related. The investigation is focused on differences in the aggressive behaviour of students with average and high rates of impulsivity. The research sample consists of 5841 pupils in the Czech Republic and the Slovak Republic aged 10-15 years. Impulsivity was measured by Impulsiveness Scale (SIDS). Impulsivity is conceived as a one-dimensional construct. Aggressive behaviour was determined with Buss-Perry Aggression Questionnaire (BPAQ) that consists of scores for: (1) physical aggression, (2) verbal aggression, (3) anger and (4) hostility. A statistical analysis revealed significant differences in aggressiveness between research groups, which differed in impulsivity levels. This supports the assumption of a relationship between aggression and impulsivity.

Keywords: impulsivity, aggressive behaviour, hostility, socio-cultural differences, adolescence.

1 Introduction

Impulsiveness is basically the tendency to act without thinking. Brunelle et al. (2009) reported that it is a tendency to respond quickly to cues associated with reward, without enough time to consider long-term consequences. Impulsiveness has, according to Eysenck, deep biological roots (In Vazire & Funder, 2006), including lower serotonin and specific patterns of activity in the neocortex. Impulsivity also appears to be hereditary (In Vazire & Funder, 2006). Mustanski et al. (In Brunelle et al. 2009) reported that in neurobiological terms, impulsivity inherently includes self-regulatory deficit and poor capacity to think with respect to social norms. This is related for example to the observed relationship between impulsivity and risky sexual behaviour and other antisocial behaviour, or aggressive behaviour, which impulsivity is often confused with (Critchfield, Levy & Clarkin, 2004; Finn et al. 2000; Krueger et al. 2002; Skopal, Dolejš & Suchá, 2014). Aggressive behaviour and impulsivity are concepts that often confused (García-Forero, 2008), with some authors even considering them the same personality factor (Critchfield, Levy & Clarkin, 2004; Coccaro et al. 1989; Siever and Davis, 1991). Although these two phenomena undoubtedly share the same process of development, they are not synonyms.

1.1 Theoretical framework

According to Eysenck (1993; In Spinella, 2004; Vazire & Funder, 2006; Zuckerman, 1995) impulsivity is biologically determined. In 1995 Zuckerman (In Zuckerman & Kuhlman, 2000) devised a biochemical concept, in which he clarifies personality traits (sociability, impulsive sensation seeking) associated with risky behaviour; sensation seeking also refers to an assessment scale that includes the factors of impulsivity and sensation seeking (Zuckerman, 1994; In Zuckerman & Kuhlman, 2000). The biochemical model focuses on the influence of neurotransmitters, hormones and enzymes. It is reported that lower levels of the monoamine oxidase enzyme are associated with behaviour linked to sensation seeking (including impulsivity), extroversion, sociability and behavioural addictions, i.e. abuse of alcohol, tobacco, illegal drugs or sexual activities.

Impulsivity is one of the characteristics of human behaviour that affects various areas of life. In extreme forms, it is linked to psychopathology (Grygorian, 2012). Higher impulsivity

accompanies varied neuropsychological conditions such as bipolar disorder, suicidal tendencies, attention deficit hyperactivity disorder (ADHD), borderline personality disorder, antisocial personality disorder, and behavioural disorders (DSM-V, Raboch et al. 2015) or various forms of high-risk behaviours (Skopal, Dolejš & Suchá, 2014).

The dictionary of psychology (Hartl & Hartlová, 2000) defines impulsivity as the tendency of a personality to act suddenly, on a whim, without considering the consequences. Impulsivity as defined by APA (2007) is a behaviour characterized by little or no forethought, reflection, or consideration of the consequences. It may also be associated with risk-taking behaviour. Zuckerman and Kuhlman (2000, 1000) reported that impulsivity is a "tendency to enter into situations, or rapidly respond to cues for potential reward, without much planning or deliberation and without consideration of potential punishment or loss of reward". While in this case impulsivity is described as a rapid response to reward, the authors also report further in the text that impulsivity is characterized by intolerance to negative emotions.

In order to understand the etiology and origin of aggressive behaviour in relation to impulsivity, a clear definition and distinction need to be made. Aggression is often compared to "anger" or "hostility". Some experts, however, define these terms as separate concepts, rejecting them as synonyms (García-Forero, 2008; Suris et al. 2004).

Some authors (e.g. Coccaro, 1998) propose that the lack of conceptual distinction between the terms may be used to represent the target behaviour. Clear criteria for investigation of the constructs need to be specified in order to eliminate confusion on the conceptual or methodological level. Some authors (e.g. Suris et al. 2004) indicate that these variables are interconnected through higher order constructs to the degree that they share variances. As noted above, impulsivity is defined as "a predisposition toward rapid, unplanned reactions to internal or external stimuli without regard to the negative consequences" (Moeller et al. 2001, 1784). This definition describes impulsivity as a personality trait, understanding it as a tendency to trigger responses to stimuli. These concepts have been interchanged in many empirical studies. For example Dolan et al. (2001) studied the relationship between impulsivity, aggression and serotonin function on a sample of offenders with personality disorder. The authors reported that "it was difficult to distinguish between impulsivity and aggression." Considerable efforts have been devoted to the classification of aggressive behaviour. Barratt & Slaughter (1998) classified the aggression into three categories: *pre-meditated, medically-related, and impulsive aggression*. Coccaro (1998) took this a step further and defined *impulsive aggression* as unintentional aggressive behaviour.

Impulsive aggression is defined in a number of ways, for example as: a trait (Coccaro et al. 1989; Siever & Davis, 1991); a subset of impulsive behaviours (Seroczynski et al. 1999); a subset of aggressive behaviours (Barratt et al. 1994; Barratt, et al. 1999); as their combination or interaction of separate characteristics (Depue & Lenzenweger, 2001). Due to the ambiguity of definitions, classification of impulsivity is relatively unclear (Critchfield, Levy & Clarkin, 2004, 558). On the other hand Critchfield, Levy & Clarkin (2004) highlight the fact that impulsivity and aggression are expected to co-occur on the phenotypic level, which justifies the use of *impulsive aggression* as a phenomenon of a similar dimension (García-Forero, 2008).

As regards the assessment of impulsive aggression, Coccaro and his team (Coccaro, 1998; Coccaro et al. 1998) devoted much effort to defining the difference between the concepts of impulsivity and aggression (Olvera et al. 2001). Coccaro focused on detecting the degree and correlation of aggression and impulsivity in adolescents in the concept of intermittent explosive disorder (IED). While Coccaro and his team do not regard impulsivity and aggression as interchangeable, they are

unable to explain the difference between the concepts as although patients with IED had a higher impulsivity score, it was not statistically significant.

Our paper mentions only a few examples of the ambiguity in this field. Some scientists cite "aggression" referring to "aggressiveness", others cite "impulsive aggression" referring to "aggression" (García-Forero, 2008). This leads to scientific deficiency that could result in errors in the interpretation of research results in relation to the theoretical framework. As reported by some authors, impulsivity and aggression are probably dispositions. Aggression is an observable behaviour and an impulse a driving force. It could be argued that the finding that impulsive and aggressive behaviours are associated with the functioning of the same biological mechanisms (Frankle et al. 2005; Seroczynski et al. 1999) could imply that there is a relationship between the two constructs, and even that they function as a single trait-like dimension. In order to solve this problem, Critchfield, Levy & Clarkin (2004) studied the relationships between *impulsivity*, *aggression* and *impulsive aggression* in individuals with borderline personality disorder. Relying on an analysis of principal components, they examined *impulsive aggression* as a single phenotypic dimension and established that impulsivity and aggression are separate constructs. The small size of the research sample, however, prevents authors from drawing general conclusions. Webster and Jackson (1997) describe several methods for impulsivity assessment. One of the options is diagnostic interview, a tool serving to detect selected impulsive problems. Furthermore, the authors discuss observation of a subject by parents and teachers. Impulsivity can also be assessed using neurobiological tests and cognitive tasks. Another method is self-report scales that rely on the subject's subjective evaluation, which are used for assessment of aggressive behaviour and impulsivity in our research.

Based on the preceding studies, we assume that impulsivity and aggression are closely related. Under this assumption, our research aims to identify the rates of impulsive and aggressive behaviour on a sample of students aged 10 to 15 years. In particular, we will focus on the differences in aggressive behaviour relative to the rate of impulsive behaviour in students, hypothesising that high-impulsive students will differ in their higher levels of aggressive behaviour as compared with students with low and average impulsivity.

1.2 Research sample

The representative research sample consists of approximately 5841 students of grades 5 to 9 of primary schools, eight-year grammar schools and six-year grammar schools in the Czech Republic (N = 4089) and the Slovak Republic (N = 1752). The mean age of the adolescents was 12.82 years with a standard deviation of 1.34 year (Slovakia M = 12.44; Czech Rep. M = 12.99). Of the total number of students, 48.3% were boys and 51.7% girls. The population in the Czech Republic consisted of approximately 349000 children of the given age range. In Slovakia it was about 230000 children. Dolejš, Skopal and Suchá tested approximately 1.2% of the population, and Čerešník tested approximately 0.8% of the population. The research sample was split into two groups depending on the impulsivity rates: average-impulsive students and high-impulsive students. The first group included students who scored up to "mean + 1 standard deviation" on the impulsivity scale. The other group included students who scored higher than

"mean + 1 standard deviation". Clinical experience shows that these students tend to behave more aggressively than students with low or mean levels of impulsivity. In the results this distinction is named as "average" and "high" impulsivity.

1.3 Methods

The Impulsiveness Scale designed by Dolejš and Skopal (Czech version: Dolejš, Skopal (2016); Slovak version: Čerešník, Dolejš, Skopal (2016)) is a measure for the identification of impulsivity levels in adolescents over a short period of time. SIDS is a screening tool used for clinical testing (psychologist), education (school psychology) and counselling (psychology, special education). Its 24 items examining the impulsivity factor were generated from mathematical and statistical analyses. The final version of SIDS contains 24 items that generally correlate with the total score in the range of $r = 0.19$ through $r = 0.65$; the majority is thus in the moderate relationship range, at a significance level of $p < 0.001$. The factor loading ranges from 0.13 to 0.68 (Dolejš & Skopal, 2016; Čerešník, Dolejš & Skopal, 2016). The SIDS aggression scale thus comprises a total of 24 items, of which four are reverse. The response score may range from 24 up to 96 points. A higher score equals a higher degree of impulsivity. As part of the research, we also investigated the internal consistency of the tool using Cronbach's α . In both the Slovak and Czech versions it equalled 0.86.

Buss-Perry Aggression Questionnaire (BPAQ) is based on the premise that aggression is a complex phenomenon, and it is therefore necessary to divide aggressive behaviours in several subgroups. Consequently, we will be able to establish the overall aggression of a subject as well as the way aggression manifests specifically in the said subject. Published in 1992, Buss-Perry Aggression Questionnaire quickly became the gold standard for the measurement of aggression (Gerevich, Bacskai & Czobor, 2007). Several validation studies have been carried out: e.g. Argentina, Netherlands, Chile, and Turkey. The authors of the questionnaire understand aggression as a personality trait comprised of four components. The BPAQ aggression questionnaire is made up of 29 items and measures four dimensions of aggression (Buss & Perry, 2002):

- 1) *Physical aggression* (PA) involves physical hurting or harming of others and represents the instrumental or motor component of behaviour;
- 2) *Verbal aggression* (VA) involves verbal hurting or harming of others and represents the instrumental or motor component of behaviour;
- 3) *Anger* (A) involves physiological arousal (preparation for aggression) and represents the emotional and affective component of behaviour;
- 4) *Hostility* (H) consists of feelings of ill will and injustice and represents the cognitive component of behaviour.

2 Results

Tables 1 to 4 show the results of the statistical analyses. The statistical analyzes were processed using the IBM SPSS 20 statistical programme. Based on the results of Kolmogorov-Smirnov test, distribution of dataset is normal and for further analysis parametric test was chosen (Tomšik, 2017). Differences in *physical aggression*, *verbal aggression*, *anger* and *hostility* among students of various research categories were investigated using the Student t-test. Descriptive statistics are presented in the Tables 1 and 2.

Table 1. Descriptive statistics of the research variables in Slovak research sample.

	N	MIN	MAX	M	SEM	SD	S	C
Impulsivity	1483	24	94	56.70	.279	10.739	.024	.447
Physical aggression	1700	9	45	22.91	.181	7.470	.375	-.446
Verbal aggression	1752	5	25	14.59	.092	3.852	.052	-.082
Anger	1717	7	34	17.96	.117	4.841	.281	-.341
Hostility	1711	8	40	22.83	.146	6.043	.012	-.278

N - number; Min - minimum score; Max - maximum score; M - mean; SEM - standard error of mean; SD - standard deviation; S - skewness; C - kurtosis.

Table 2. Descriptive statistics of the research variables in Czech research sample.

	N	MIN	MAX	M	SEM	SD	S	C
Impulsivity	4089	24	92	58.48	.155	9.905	-.002	.264
Physical aggression	3908	9	45	22.61	.122	7.651	.344	-.452
Verbal aggression	3916	5	25	15.48	.062	3.857	-.042	-.197
Anger	3910	7	35	19.60	.086	5.350	.084	-.406
Hostility	3896	8	40	24.53	.097	6.034	-.180	-.356

N - number; *Min* - minimum score; *Max* - maximum score; *M* - mean; *SEM* - standard error of mean; *SD* - standard deviation; *S* - skewness; *C* - kurtosis.

The research group of Slovak students had *N* = 1173 (84.1%) of average-impulsive and *N* = 221 (15.9%) of extremely impulsive students. When comparing the research groups using the BPQA variables, we found statistically significant differences in aggression across all the subscales at the statistical significance of $p < 0.001$ (physical aggression $t = 14.396$, $p < 0.001$; verbal aggression $t = 14.079$, $p < 0.001$; anger: $t = 14.481$, $p < 0.001$;

hostility: $t = 10.524$, $p < 0.001$; Table 3). Risk-impulsive adolescent scored a higher average in all monitored variables, compared with the average-impulsive adolescents. Specifically, risk-impulsive adolescents scored 7.39 higher in *physical aggression*, 3.71 higher in *verbal aggression*, 4.81 higher in *anger*, and 4.51 higher in *hostility* compared to the average-impulsive adolescents.

Table 3. Comparison of Slovak adolescents in BPQA variables by impulsivity.

	Impulsivity	N	M	SD	SEM	df	t	p
Physical aggression	High	221	29.03	7.546	.508	1392	14.396	< .000
	Average	1173	21.64	6.900	.201			
Verbal aggression	High	222	17.84	3.397	.228	1432	14.079	< .000
	Average	1212	14.13	3.646	.105			
Anger	High	222	22.03	4.954	.332	1410	14.481	< .000
	Average	1190	17.22	4.460	.129			
Hostility	High	222	26.76	5.968	.401	1405	10.524	< .000
	Average	1185	22.25	5.837	.170			

N - number; *M* - mean; *SD* - standard deviation; *SEM* - standard error of mean; *df* - degrees of freedom; *t* - Student *t* test; *p* - statistical significance.

When comparing the Czech average-impulsive (*N* = 3733; 96.7 %) and risk-impulsive students (*N* = 121; 3.14 %) using the BPQA variables, we found statistically significant differences in aggression across all the subscales at the statistical significance of 0.001 (physical aggression $t = 14.633$, $p < 0.001$; verbal aggression $t = 11.016$, $p < 0.001$; anger: $t = 15.585$, $p < 0.001$; hostility: $t = 9.603$, $p < 0.001$; Table 4). Risk-impulsive students

scored a higher average in all monitored variables, compared with the average-impulsive adolescents. Specifically, extreme-impulsive adolescents scored 10.07 higher in *physical aggression*, 3.87 higher in *verbal aggression*, 7.49 higher in *anger*, and 5.34 higher in *hostility* compared to the average-impulsive adolescents.

Table 4. Comparison of Czech adolescents in BPQA variables by impulsivity.

	Impulsivity	N	M	SD	SEM	df	t	p
Physical aggression	High	121	32.36	7.620	.693	3852	14.633	< .000
	Average	3733	22.29	7.451	.122			
Verbal aggression	High	121	19.24	3.717	.338	3861	11.016	< .000
	Average	3742	15.37	3.804	.062			
Anger	High	121	26.86	4.543	.413	3854	15.585	< .000
	Average	3735	19.37	5.224	.085			
Hostility	High	119	29.73	5.611	.514	3842	9.603	< .000
	Average	3725	24.39	5.987	.098			

N - number; *M* - mean; *SD* - standard deviation; *SEM* - standard error of mean; *df* - degrees of freedom; *t* - Student *t* test; *p* - statistical significance.

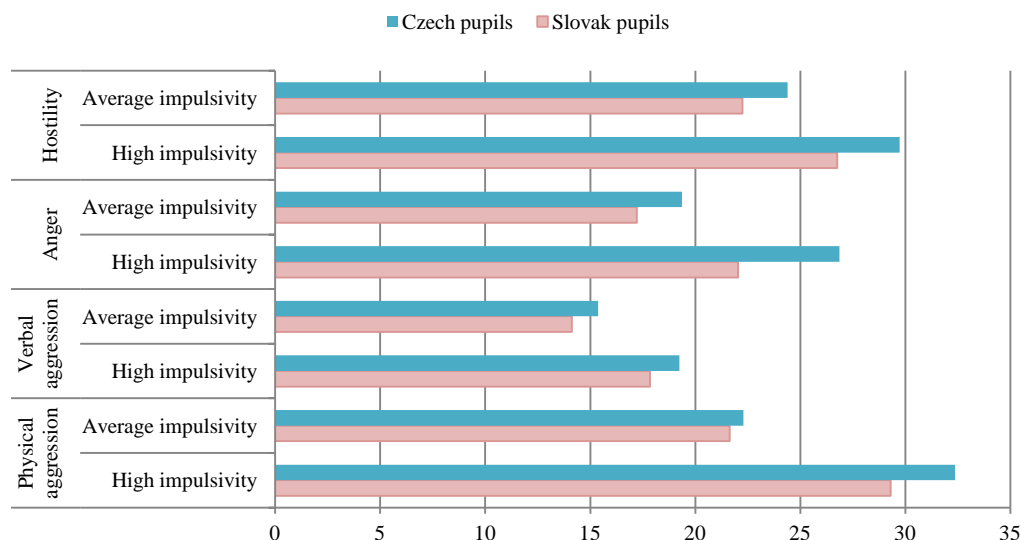


Figure 1 The average values of aggressiveness variables in the relation to the impulsivity in Slovak and Czech sample

The results are summarized in Figure 1. We can see that the group with high level of impulsivity (more than mean + 1 SD) reached the higher score of aggressiveness in all subscales in the comparison with the group with average level of impulsivity (up to mean + 1 SD). The order based on the average score was: physical aggression, hostility, anger, verbal aggression both in Slovak and Czech sample. We can also see that Czech adolescents were more aggressive, however in the Czech research sample there is a smaller percentage of aggressive students. This difference was significant except for verbal aggression. And that was the reason of separate analysis of Slovak and Czech sample.

3 Discussion

Impulsiveness comes from the root word 'impulse'. According to the principles of bioenergetics (Lowen, 2009) an impulse occurs upon contact of a (human) body with the environment; it is a flow of energy directed towards the periphery of the body. Together with this process, the body is confronted with stimuli from the external environment. In a healthy organism, pulsating energy may thus continuously transform into predictable behaviour that is beneficial to the individual and harmless to other people. The humanistic interpretation (e.g. Rogers, 2014) argues that congruence is one of the preconditions of a fully-functioning personality.

The developing organism, however, is limited by socio-cultural norms that determine what is desirable and what is not in terms of society's reproducibility. The humanistic tradition mentions conditions of valuation that threaten the process of personality development. From the perspective of bioenergetics, this involves "bracing oneself", a process of separating inner feelings from the peripheral areas of the body, which impairs integrity of the body and the world. Although the person has a relatively high energy potential, this potential is not made use of in line with the true needs of the body, and ultimately the individual is highly likely to develop a psychopathic character (Lowen, 2009), characterized by emotional dissociation and a tendency to control other people. With this character structure on mind, we may identify frustration, induced by poor saturation of psychological needs. A typical reaction to frustration is aggressive behaviour in the form of self-punishment or punishment of others.

Analysis of the data suggests that there is a relationship between impulsivity and aggression (our assumption can be supported) and that these two variables share the same process of development. Its interpretation depends on the concept or theory

that is set as crucial. Our interpretation is grounded in the bioenergetics and humanistic approach. This explains aggressive behaviour of risk-impulsive adolescents as a consequence of an inadequate family environment. Due to this environment, a developing adolescent suffered loss of contact with their body, loss of self-understanding and loss of capacity to understand self-related feelings. In connection with the integration process that takes place in the brain as collaboration between the prefrontal cortex and the limbic system, which is part of the rational-emotional regulations of behaviour, such a development hinders any progressive use of the energy potential of the organism.

A challenge that emerges as part of anticipated interventions is to utilise this life force of at-risk adolescents so that it is not limited by frustration and aggression. This means strengthening self-awareness, introducing a healthy lifestyle, and in extreme cases even abreaction therapy.

Another research challenge is the triangulation of methods that diagnose impulsive behaviour, as well as a greater emphasis on the ecological validity of the generated results and experimental design of research projects in the sense of diagnostic work with real high-risk situations in which the adolescent population may find themselves.

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Primary Paper Section: A

Secondary Paper Section: AM, AN, AO

SUSPENSION OF EMPLOYEE'S DUTIES AS A RESULT OF TEMPORARY INCAPACITY FOR WORK IN ACCORDANCE WITH SLOVAK LEGAL REGULATIONS

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Abstract: A sickness of an employee and his/her recognition as temporarily incapable for work has several important consequences in labor relations. If an employee sees a physician because of an ailment and thus is recognized as temporarily incapable for work based on the found health condition, the duties of such an employee is suspended and he will not go to work because of his/her illness and will not receive wages. The paper analyses the problematics of the rise and duration of temporary incapacity for work which follows certain legal guidelines. Since the question of financial support during temporary incapacity for work is of high importance for the sick employee, his title for financial compensation during temporary incapacity for work is pointed out in the paper. Even though the above mentioned type of hindrance to work is rather common, in reality there is inadequate knowledge of this field and that is why the issue is paid attention in our paper.

Keywords: employee, hindrance of work, temporary incapacity for work, income compensation during temporary incapacity for work, sick pay

1 Introduction

In the Slovak Republic employment is one of the basic labor relations. During employment there may occur situations which hinder fulfilment of responsibilities following from the contract, i.e. an employee may not be able to work or employer may not be able to allocate work. Such a situation means temporary suspension of employment without ending it completely. Slovak legislation in Act No. 311/2001 Coll. Labor Code as amended describes these situations as "hindrances of work on the employee's side" and "hindrances of work on the employer's side".

A sickness of an employee and his/her recognition as temporarily incapable for work has several important consequences in labor relations. If an employee sees a physician because of an ailment and thus is recognized as temporarily incapable for work based on the found health condition, the occupational activity of such an employee is suspended and he will not go to work because of his/her illness and will not receive wages. Based on assessed health condition the physician prescribes medication and the course of treatment. The employee becomes temporarily incapable for work and within his/her employment important personal hindrance of work arises according to § 141 Labor Code.

2 The definition of the term "temporary incapacity for work"

From the point of view of its duration an ailment may be short-term or long-term. As Matlák states: „short-term ailments are included in the term of incapacity for work. Long-term health conditions are connected in theory, legislation as well as praxis of social security with the term of disablement.“¹

The term of "temporary incapacity for work" is of interdisciplinary character. The term is not only used in healthcare but also in the field of industrial law in connection to a halt of work activity and suspension of work responsibilities, as well as in the field of law on social welfare in connection to financial liability or allowances, which belong to the employee based on his sickness insurance and meeting requirements given by the law during temporary incapacity for work. In everyday life we encounter alternative terminology such as temporary work incapability or the so called "PN".

In healthcare temporary incapacity for work follows from providing medical care. The issue of "temporary incapacity for work" is regulated by the law in § 12a Act No. 576/2004 Coll. on healthcare and on services connected to healthcare as

amended and supplemented by later regulations (further on only "Act on healthcare"). This ruling sets out the issues of arisen temporary incapacity for work, the issue of legible person who decides about the temporary incapacity for work, it regulates the acknowledgement form for temporary incapacity for work, outings as well as other related issues. However, we would like to draw attention to the fact that a definition of the phrase is not provided within basic terminology.

Apart from the Act on healthcare, temporary incapacity for work is dealt with in Act No. 461/2003 Coll. on social insurance as amended by later regulations, in connection with the maximum duration of temporary incapacity for work as well as with the paid benefit of health insurance – sickness pay offered by Social Insurance Agency during the duration of temporary incapacity for work. It follows from § 33 and § 34 of the Act on social insurance that temporary incapacity for work concerns not only employees but also self-proprietors paying mandatory health insurance and people voluntarily health insured.

Since temporary incapacity for work also concerns an employee it is a paradox that the Labor Code does not define the term of temporary incapacity for work. Temporary incapacity for work is only mentioned in connection with several circumstances. Talking about the protection of employees in article 8 of the Labor Code, it grounds the right for financial support during incapacities for work of employees and apart from the mentioned it secures higher protection of employees in labor relations in the time of their incapacity for work because of sickness. We could find a note about temporary incapacity for work also in § 64 of the Labor Code when an employer may not lay an employee off during his temporary incapacity for work. Temporary incapacity for work is considered a protected period – making an employee redundant is forbidden. According to § 141 of the Labor Code an employer is obliged to pardon the employee's absence at work during his/her incapacity for work because of sickness or injury. Last we have to draw attention to one of the basic obligations of an employee according to § 81 of the Labor Code when an employee is obliged to act according to doctor's prescribed course of treatment to be entitled for compensation of pay during temporary incapacity for work.

Based on the above mentioned facts we can say that when defining the term of temporary incapacity for work itself, it is not possible to rely on a relevant legislation since the term itself is not defined by any Slovak legal regulation within healthcare legislation, any labor regulation or normative legal act within social welfare law. We could take an example of legal regulation in the Czech Republic which grounds positive as well as negative definition of the term of "temporary incapacity for work". According to § 55 (1 and 2) Act No 187/2006 Coll. on sickness insurance as amended by later regulations "temporary work incapacity is understood as a status which makes it impossible for the employee: a) to continue in the insured work activity due to health disruption or other reasons not stated in this law and when such health disruption lasts for more than 180 days, also another up to now insured work activity; b) to meet the requirements for a job candidate if the temporary incapacity for work arose within the protected term or if the work incapacity lasts after ending the up-to-now insured work activity, even if the insured is not a job candidate. It is not considered temporary work incapacity if the insured is treated a) in a night sanitarium during intoxication after using alcohol, narcotics or psychotropic substances, with an exception of using these substances without own infliction, c) and offered healthcare in his/her own interest based on cosmetic or esthetic reasons paid by the insured."

Because there is no legal definition of the term of temporary incapacity for work, it can be concluded from the phrase itself that it is a time during which an employee cannot work for a certain time because of health reasons (sickness or injury).

¹ Matlák, J.: *Právo sociálneho zabezpečenia*. Aleš Čeněk s.r.o., 2009. p. 159

Because we are talking about temporary incapacity for work it is expected that the ill employee will recover soon and be able to continue performing his/her work responsibilities. The opposite of work incapacity is work capability as “a relationship between life and work functions of given person, between his/her work capability on one hand and requirements placed upon him by the work activity which he/she is to perform on the other hand. At the same time it depends on the purpose why is such a relationship i.e. work capability or incapacity being found out and evaluated, and also it depend on the fact how is such a relationship for such purpose adjusted and normatively defined.”²

3 Assessment of temporary incapacity for work and its duration

Causes and length of duration of temporary incapacity for work are varied. Concerning the causes, incapacity for work may be stated because of a sickness, injury, work injury, occupational disease, another general ailment or the reason of ordered quarantine precaution.

Depending on the diagnosis, the course of the sickness, duration and substance of treatment, the attending physician (general practitioner or specialized doctor in gynaecology and obstetrics when offering non-resident care or a doctor of a healthcare facility) decides upon the length of duration of temporary incapacity for work and issues an acknowledgement stating temporary incapacity for work. In the decision process the doctor assess the employee's capacity for the given work including the influence of work and work environment on his health condition. Based on the assessed health condition of the employee the physician prescribes medication and the course of treatment.

The temporary incapacity for work starts on the day when the attending physician found out about the disease which makes him state the incapacity for work. An exception is a situation when healthcare is provided to an employee after finishing his shift because that is the case when temporary incapacity for work starts on the next day. (§ 12a (3) of the Act on healthcare). Analogically it follows that if healthcare is provided during work shift of an employee, incapacity for work starts on that very day. However, from the point of view of applied praxis, problems arise concerning how such an employee is financially supported. Is such an employee indemnified for all day's pay even if he worked for part of the day or should he receive the sickness benefit just for the aliquot part of the day? If an employee worked during the day when his title to the benefit originated, he/she is to receive a benefit for the aliquot part of the day. Even though, this benefit is only offered in an aliquot sum, this day is counted for the support period for offering compensation of pay during temporary incapacity for work as well as sick pay. These are just different interpretations of the issue.

A doctor may state temporary incapacity for work retroactively. Retroactive acknowledgement of temporary incapacity for work concerns such cases when a person was not able to see a doctor based on reasons laid down by law. The attending physician may acknowledge a person incapable to work retroactively for not more than three calendar days based on medical finding of first aid medical service or institutional emergency service (§ 12a (4) Act on healthcare). The time-limit of three days for retroactive acknowledgement of temporary incapacity for work has been in force as of July 1, 2014. Until this date retroactive acknowledgement of temporary incapacity for work by an attending physician had not been laid down by law. In case such medical finding is absent, contrary to previous practice, according to valid legal regulation an attending physician can acknowledge an employee incapable to work on the day when such work incapacity was found by him/her. In case urgent care connected to hospitalization abroad was offered and the person submitted hospital discharge papers to the attending physician within three days of the end of hospitalization in abroad, the

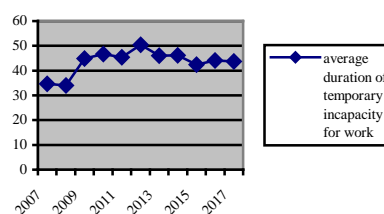
attending physician issues an acknowledgment of temporary incapacity for work retroactively while the beginning date of the temporary incapacity for work is set according to the discharge papers.

As for the duration of temporary incapacity for work, according to the Act No. 461/2003 Coll. on social insurance as amended by later regulations the time of support for offering sick pay during temporary incapacity for work is 52 weeks maximum.

In Slovakia the number of temporarily incapable for work is growing. “In 2017 there were daily 96,127 insured with incapacity for work on average which confirms the negative growing trend from the past – in 2016 there were 91,904 people on average incapable to work, in the year 2015 it was 87,803 insured.”³

The durations of temporary incapacities to work differ. In the past decade there has been a growth and further on a stagnation of average duration of temporary incapacity for work in the nationwide average. The greatest change was recorded in the year 2009 (44.87 days) compared to the year 2008 (33.96 days). The longest average duration of temporary incapacity for work in the past decade was in the year 2012 when it reached 50.48 days as shown in the following Graph 1.

Graph 1: Average duration of temporary incapacity for work in days (2007-2017)



Source: own processing according to Statistical Office SR (2018)

As for the duration of temporary incapacity for work from the point of view of reasons for temporary incapacity for work, people with respiratory system diseases as

the most common reason for incapacity for work usually are incapable to work for a short term with the duration of incapacity up to 10 days, namely for urgent respiratory infections and influenza. Temporary incapacity for work because of muscular and skeletal system diseases and fibrous tissue problems, usually lasts 43 to 91 days. Frequent open wounds and flesh wounds, dislocations, wrenches and repositioning of joints require duration of incapacity for work from 43 to 91 days.⁴

In this connection it should be noted that the duration of temporary incapacity for work influences the percentage of incapable to work. The shorter the duration of temporary incapacity for work the higher the percentage of incapable to work. Such disproportion is given by short-term diseases in flu season.

The duration of temporary incapacity for work depends on the social status of a patient, also his functional rank. When it comes to managers of organizations extensions of duration of temporary incapacity for work is not expected but he/she will use the shortest treatment type possible. The duration of temporary incapacity for work is also influenced by the check of keeping the treatment regime. It is assumed that consistent enforcement of such check-ups especially of time intervals can positively influence the duration of temporary incapacity for

² Gregorová, Z. - Galvas, M.: *Sociální zabezpečení*. 2. vyd. Brno : Nakladatelství Doplněk, 2005. 280 p.

³ Social Insurance Agency. 2018. Ústredie Sociálnej poisťovne informuje. [online]. [quoted 2018-06-10]. Available at: <<https://www.socpoist.sk/aktuality-vlani-opat-vzrastol-pocet-pn/65424>>

⁴ Social Insurance Agency In Statistical Office SR. 2018. [online]. [quoted 2018-06-10]. Available at: <<http://datacube.statistics.sk/TM1WebSK/TM1WebLogin.aspx>>

work. Last but not least the duration of temporary incapacity for work is influenced by medical progress – replacement of a knee joint takes three days, after plastic surgeries e.g. of breasts the medical institution will discharge the patient on the next day, even though the patient is not completely self-reliant.

3.1 Issuing an acknowledgement of temporary incapacity for work

There is a special form to prove temporary incapacity for work of an employee which serves for claiming financial support. After acknowledging an employee incapable to work the attending physician issues an acknowledgement of temporary incapacity for work on a prescribed form (five-part “Acknowledgement of temporary incapacity for work”), prescribes medication and treatment. The employee tells the doctor where he is reachable during his/her work incapacity and the doctor provides the place in the form. “Acknowledgement of temporary incapacity for work” for the purpose of a Social Insurance Agency check, as well as the employer if the person in question is an employee. The attending physician may allow for a change of address where the employee is staying during temporary incapacity for work based on previous request of the employee if there is a serious reason for this. The change of address of the employee is recorded on the acknowledgement form of temporary incapacity for work as well as in the medical documents of the person incapable for work.

The employee is obliged to inform the employer about the arisen temporary incapacity for work. The employee delivers or sends the acknowledgement (II. part) to his/her employer, so that he could claim for pay compensation or sick pay during work incapacity. If another incapacity for work arises for the employee on the next day after the incapacity for work just ended (which lasted for example for 14 days), this is considered an extension of incapacity for work of the previous incapacity for work and the attending physician issues a new acknowledgement of temporary incapacity for work where “extension of temporary incapacity for work” is marked. The new acknowledgement of temporary incapacity for work is issued by the attending physician as of the day stated as the first day of incapacity for work on the previous acknowledgement of incapacity for work. The extension of temporary incapacity for work is conditioned by the Act on healthcare by worsened health condition of the person after ending the temporary incapacity for work, which means that in the given case a change of diagnosis is not taken into account.

3.2 Financial claims of an employee during temporary incapacity for work

The moment when temporary incapacity for work arises is very important since further issues follow from it, such as fulfilment of financial liability by the Social Insurance Agency or the employer. Social Insurance Agency (2014) emphasizes though, that if the temporary incapacity for work will be acknowledged contrary to legal rules i.e. will be issued by an inappropriate doctor, will not be acknowledged from the date when the disease was found out or will be acknowledged more than three days retrospectively, the claim for sick pay will not be considered valid.

There are two different financial claims valid for an employee – sickness benefit and compensation of pay during temporary incapacity for work. Sick pay is provided by the Social Insurance Agency amounting to 55% of daily assessment base. An employee may claim for sick pay from the 11th day of temporary incapacity for work because by then from the first day of his incapacity he receives compensation of pay from his employer according to Act No. 462/2003 Coll. on compensation of pay during an employee’s temporary incapacity for work as amended and supplemented by later regulations. The stated facts do not apply in the case if temporary incapacity for work arose for an employee in the so called protected period which is seven days after termination of sickness insurance unless the Act on

social insurance states otherwise. Such an employee is entitled for sick pay from the first day of temporary incapacity for work.

The claim for compensation of pay is valid if the employee is temporary incapable for work due to a sickness or injury and thus he does not receive wages, salary or another form of remuneration.⁵ The compensation of pay during temporary incapacity for work is provided by an employer to an employee for the first ten calendar days from the day when temporary incapacity for work arose. Since an employer provides compensation of pay amounting to 25% of daily assessment base for the first three days (from 4th to 10th day amounting to 55% of daily assessment base), which is not very financially advantageous for the employee, employees often prefer taking a day off instead of temporary incapacity for work, of course on condition that the employer allows them to take a holiday. During holiday an employee is entitled to compensation of pay. Preference to take a paid leave over being temporary incapable to work happens especially during trivial illnesses such as a cold or migraine which do not call for a long time to recover. However, it is possible that by preferring this option harmful consequences on health may intensify with a later risk of even more serious disease. This can eventually mean a much greater financial burden.

Financial security of an employee during temporary incapacity for work is influenced by continued temporary incapacity for work (after ending temporary incapacity for work the health condition of the person gets worse), and occurrence of a new temporary incapacity for work, when an employee receives the benefit of sickness insurance - sick pay - from Social Insurance Agency further on. On the contrary i.e. when temporary incapacity for work arises for an employee an employer has to provide compensation of pay during temporary incapacity for work. However, this does not apply if such temporary incapacity for work was acknowledged from another labor relation which participates in sickness insurance. In case when activities are performed within several labor relations participating in sickness insurance, the attending physician assesses temporary incapacity for work individually. This means that for one activity an employee may be acknowledge temporary incapable to work and for another he may continue able to work.

The period during which sick pay is provided is called support period. It may not exceed 52 weeks from the beginning of temporary incapacity for work. The title for sick pay ends on the day following termination of temporary incapacity for work, no later than 52 weeks after beginning of temporary incapacity for work (support period thus includes the first ten days of temporary incapacity for work when an employee receives compensation of pay from the employer). The support period includes previous periods of temporary incapacity for work if they belong within 52 days before it arises. Previous periods of temporary incapacity for work are not included in the support period if sickness insurance lasted for at least 26 weeks from the termination of last temporary incapacity for work and the insured did not become temporarily incapable to work during this time. The support period does not include a period of ordered quarantine precaution.

4 Conclusion

It is obvious from the practice that each employee during his/her carrier is found in a situation when a sickness or injury prevents him/her from going to work. An ailment results in certain disruption of work ability which is usually only short-term.

After analysing the problematics of temporary incapacity for work resulting from a sickness or injury we have come to the conclusion that the term itself is not defined neither by any Slovak legal regulation within healthcare legislation nor by labor ruling or normative legal act in the scope of law of social security. The issue of temporary incapacity for work is a part of several legal regulations. We may encounter it not only in the

⁵ Barančová, H. at al.: *Pracovné právo*. Bratislava: SPRINT, December 2007, p. 568

environment of healthcare in connection with the rise of temporary incapacity for work but also in the field of labor law as a hindrance to work on the side of an employee, as well as in the field of the law of social security in connection with financial support of an employee during temporary incapacity for work. In this connection it should be considered whether it is not pertinent to unify the problematics of temporary incapacity for work and regulate it legally in one legal ruling or ground it individually in the Labor Code in connection with an employee.

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Primary Paper Section: A

Secondary Paper Section: AG

CURRENT USE OF PERSONNEL MARKETING IN CZECH COMPANIES

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Abstract: Personnel marketing is a new scientific discipline combining two classic fields – personnel management and marketing. The main idea of personnel marketing is the perception of the employee as a customer and the satisfaction of their needs and wishes. The article takes an in-depth look at current personnel marketing in the Czech Republic. Primary research is employed to identify thirteen tools of personnel marketing, and the effectiveness and frequency of use of these tools is empirically demonstrated. The relationship between the effectiveness and frequency of the tools is then statistically investigated. Differential analysis was used to establish that the frequency of use is lower than the perceived effectiveness. Regression analysis demonstrated the linear relationship between effectiveness and frequency of the use of these tools. Factor analysis was used to identify latent factors of personnel marketing tools.

Keywords: marketing, human resources, personnel marketing, human capital

1 Introduction

The situation on the labour market in the Czech Republic has changed dramatically over the past decade. In June 2008, unemployment was at the lowest level of 5%. After the onset of the economic recession, unemployment rose in February 2010 to 10%. Since then, unemployment has plunged almost continuously to 3.5% in March 2018 (Czech Statistical Office, 2018). Taking into consideration that roughly 2% of people aren't interested in working and about 2% are temporarily unemployed due to intentional job changes, it can be reasonably argued that demand exceeds supply on the Czech labour market. This situation in which firms are seeking employees and trying to attract them with offers of various benefits has led to great pressure on HR, and personnel managers have responded by implementing new approaches to HR management. Among these are personnel marketing, which is the subject of the research presented in this article. Personnel marketing as an Independent field combining marketing and HR emerged in Germany. Due to the strong capital link between Czech and Germany industry, processes and management are influenced by Germany. As a result, the lack of human capital on one hand and the connection with Germany has led to the introduction of personnel marketing in Czech firms. Due to the lack of clarity surrounding personnel marketing tools, a project was designed to identify these tools and determine their effectiveness and frequency of use in the Czech Republic. The aim of the first part was to identify the tools of personnel marketing. The second part focused on an empirical demonstration of the effectiveness of these tools and the current use in the Czech Republic. The choice of the research approach was based on the definition of research goals. There are three goals addressed in this paper:

- Goal 1. To determine the effectiveness of personnel marketing tools and their frequency of use in the Czech Republic.
- Goal 2. To identify the relationship between the frequency of personnel marketing tools and their effectiveness.
- Goal 3. To uncover latent factors behind determined attributes that are not obvious.

2 Personnel marketing

Establishment of the project has been the current relevance of this relatively new field, which is significant as far as competitiveness is concerned, because it focuses on acquiring and retaining quality employees as a key focus of the company. Forming the foundation of the research was a review of domestic and foreign sources. These sources serve as an information base. The basic topics of the overview of literature are the management of human capital and personnel marketing.

2.1 Human capital

Schultz (1993) states that human capital is a key element for increasing a company's wealth. Dzinkowski (2000) more

specifically and perceives human capital as the sum of knowledge, skills, innovation and capacity of employees for achieving the company's objectives. Chen and associates (2004) perceive human capital as a combination of employee competence, positions and creativity.

It is also possible in the Czech Republic to consider the influence of human capital on the quality of industrial companies as provable, and this is in accordance with current opinions expressed in foreign literature. Štamfestová (2014) conducted research, the aim of which was to verify the effect of human capital on the quality of industrial companies. In all four defined sections (innovative potential of employees, education, satisfaction and motivation for work performance) the research confirms that human capital has a positive impact on the perceived quality of production by the company. It has been shown that management employees directly via human capital, specifically through support of their innovation and satisfaction with their work, can both influence the quality and be interested in maximum motivation of them for work performance.

Current personnel staff no longer perceive employees only as one of the basic sources of their existence, but they also examine current and potential employees from the point of view of marketing, meaning as their customers. Milite (1999) states that until recently companies attention was focused on competition to win over customers and to fulfil their expectations, which is a traditional marketing matter. Currently however the attention of companies and employers has shifted to employees and to the traditional areas focused on by HR managers. These are employees, and their performance which fulfils customers' expectations in the end makes them satisfied and makes the company competitive (Wong, 2008). The labour market is getting better and companies must find ways to attract the most quality employees, and when they are employed they will seek ways to fight against fluctuations (Tillman, 2013). Modern companies are increasingly dependent on the qualifications, skills and efforts of their employees. At the same time employees are showing greater capability of changing their employers. This situation is leading to the fact that companies to a much greater extent are focused on personnel marketing, which combines two major concepts, on one hand marketing and on the other hand HR. (Schultz, 1993, Dzinkowski, 2000, Štamfestová, 2014).

2.2 Evolution of personnel marketing

The concept of personnel marketing is often perceived in very different ways. These differences are also apparent in the perception of personnel marketing in the Czech Republic and abroad. For this reason, the development and characteristics of personnel marketing are divided between the domestic and foreign markets.

In the Czech Republic, the term personnel marketing was first defined by Koubek (2015), who says that it involved the use of a marketing approach in the field of human resources, especially in efforts to form and maintain the necessary workforce in an organisation. Retaining employees is based on creating a reputation as a good employer and labour market research, i.e. on drawing attention to the organisation's employment qualities. Antošová (2005) describes personnel marketing as an activity focussed on the targeted formation, development and use of human potential consistent with the strategic goals of the company. These activities are realised in the company through the use of a personnel marketing mix. Another current of opinions among certain authors is the division of personnel marketing into internal and external, just like personnel management. The diversity of opinions regarding categorization of personnel marketing in publications demonstrates that the boundary between external and internal personnel marketing address potential employees (Luhan, W. J., et. Al, 2009). From a narrower point of view personnel marketing can be understood

as long-term acquisition of human resources from the external labour market and creation of a positive image of the employer on the labour market. More broadly they can be understood as measures focused on increasing the stability of current employees, specifically on solving problems with work motivation, management of staff, personnel development, rewarding and taking care of employees. In all of the mentioned terms and/or activities he has identified a fundamental difference. He claims that personnel marketing is done by a large number of companies, but only some of them are focused on actual employer branding. The author characterizes personnel marketing as everything that a company does in relation to current, future or former employees. These include for example personnel ads in print media or on the Internet, career columns, open house events, the hiring process, entering into an employment relationship, the means of management and remuneration, the style of internal communication, company events etc. In this case the company mainly communicates: who it is, what it does, and to whom it is seeking. Should this involve targeted employer branding, then according to the author the company would communicate: why it exists, what the purpose of its activities is and where the organization is heading, meaning its vision and mission (Menšík, 2015). Kociánová (2010) defines personnel marketing as follows: "Personnel marketing tracks the acquisition of skilled people, strengthens their bond with the organisation while simultaneously strengthening their stabilisation in the organisation". A key task of personnel marketing is the creation of a good employer reputation for the organisation that positively influences the interest of potential employees. The perception of personnel marketing in the Czech Republic can therefore be summarised in this manner. Today's personnel managers no longer view employees as just one of the basic sources of their existence; rather, they look at current and potential employees from the perspective of marketing, i.e. as their clients.

The first mention of personnel marketing in the world comes from Germany in the mid-1960s. This concept expressed the way employees were recruited after shortages of qualified workers emerged (Meier, 1991). The field of personnel marketing was divided into internal and external in the 1980s. External personnel marketing is focused on acquiring new employees, while internal personnel marketing is aimed at the stabilisation of the existing workforce (George, 2015). Grönroos (1981) expand internal personnel marketing to include the notion that it isn't enough to motivate your employees to perform better, but that it is necessary to awaken the business spirit in each and every employee. This approach aims to shape employees as businessmen who are even able to sell to customers. At the turn of the millennium, personnel marketing was already defined as a tool for satisfying the needs and values of existing employees, but also as a tool for building the good name of the employer (Barrow and Mosley, 2005). Another view or opinion regarding personnel marketing which is not entirely clear from available professional literature and which cannot be found in all characteristics/definitions from professional authors is that the terms personnel marketing and employer branding are nearly equal and that the main objective of personnel marketing is to develop the employer's good reputation. An example can be the definition of personnel marketing objectives according to Wimmers (2009) – the aim of personnel marketing is on one hand "to build a positive effect on everyone interested in the organization or who could be interested in it and mainly to build attractiveness of the organization for ambitious and motivated future employees, who are key to the sustainability of the organization." Szarková in her contribution does not divide personnel marketing into internal and external categories, and it is entirely clear from her definition that personnel marketing is a tool that leads to effectiveness in work with human resources. The author states that personnel marketing has been formed as a reflection of an organization's needs to sell a job most effectively, in other words to sell it to a qualified job applicant at the lowest costs for presentation of the job on the labour market and at the lowest costs for overall realization of the selection process (Szarková, 2015). Hence, personnel marketing tools are viewed in a wide variety of ways. According to Bednář (2013),

personnel marketing tools can be divided into product, place, price, promotion and personality. The author also says that the use of personnel marketing shouldn't be solely based on the company but should also take into consideration the view of the employee. On the other hand, some authors do not specify the tools, stating that marketing tools are those that serve for better satisfaction of the wishes and needs of employees or potential employees (Spielmann, 2015).

Therefore, personnel marketing can be described in general as a set of activities linked to the creation of a good reputation for the employer, directed both at their own employees and to potential job applicants. The primary goal of personnel marketing is the creation of prerequisites for securing qualified and motivated employee in the long-term. A summarising definition of personnel marketing: the application of a marketing approach in work with human capital in which the employee or potential employee is viewed as a customer.

3 Research methodology

The project whose results are presented here was composed of two primary studies combining qualitative and quantitative research. While both approaches have their own advantages and disadvantages, neither is superior to the other. To the contrary: they can be used in complementary fashion, as is often the case today. When both research methods are used, this type of data collection is called mixed research (Hendl, 2016). Due to its synergetic effect, this mixed research was also used for the personnel marketing study presented in this work. Qualitative research has served for a new understanding of the subject of research, which is personnel marketing (Disman, 2002).

The selection of respondents for the qualitative research was conducted using multistage random sampling, with the basic set being further divided into four groups based on the applied enterprise culture. A representative was chosen from each category for a subsequent in-depth interview. A total of twelve interviews were conducted with representatives of global firms presenting the use of personnel marketing. The study was conducted according to a pre-established scenario in which each interview was recorded and subsequently evaluated. Interview transcription was conducted collectively by marketing and HR experts. The aim of the reduction was to eliminate repetitive responses, to integrate similar responses, to capture internal relationships and preserve central, significant responses scattered throughout the text. Following the final synthesis, a list was compiled of personnel marketing tools (Tab. 1) as they are viewed by global corporations doing business in the Czech Republic.

Table 1: Personnel marketing tools

1. Analysis of competitors' recruitment strategy
2. Research focused on the identification of applicants' decision-making criteria
3. Career sites for display on mobile phones
4. Career profiles on social media
5. Incorporating game elements into the recruiting process and communication
6. Recruitment at universities
7. Targeted recruitment campaign for a specific position
8. Separate career website
9. Plan for building the company culture of the employer
10. Video presentation of company culture
11. Welcome package for new employees
12. Tools supporting employee satisfaction
13. Big data

Source: own

A detailed description of identified personnel marketing tools was compiled in an article for a scientific journal and is included

in the Scopus abstract and citation database (Myslívová and Ungerma 2018).

The results of the qualitative research were used for the related quantitative study in which the effectiveness and frequency of determined tools were evaluated using Matrix questions on a six-point scale. This work is primarily focused on the results of this quantitative study. The logic of quantitative research has been deductive. Quantitative research requires strong standardization which ensures high reliability. The purpose of quantitative research has been to determine the frequency of variables (Molnár, 2012). In view of work objectives, an exploration and descriptive purpose can be identified in research. The descriptive purpose directly examines the degree of frequency and effectiveness. The descriptive purpose, which maps the current situation and monitors the frequency and degree of association, was used for prediction of the occurrence of the phenomenon (Saunders 2002).

Respondent selection method: Simple random sampling was chosen for the quantitative study, with each unit of the basic set having the same probability that it will be selected (Mc Givern, 2013). The basic set was composed of companies with an internal SBU specialising in HR. A databank of companies was used for the study, with micro-enterprises and small firms being excluded due to an assumption supported by research that these companies do not have their own activities in the field of HR. The research plan included 100 controlled valid responses. This plan was completely fulfilled in 2018.

Data collection methods: More than one-thousand two hundred firms were addressed by means of electronic survey. To ensure the validity of responses, a contact to the human resources manager was determined for each respondent. The return rate was 8.4%, with several surveys being excluded for failing inspections.

Data evaluation methods: The SPSS Statistics program and Microsoft Excel were used statistical analysis. The evaluation methods correspond to the established goals:

- The descriptive statistic* determines and summarises information, processes it in the form of graphs and tables and calculates their numerical characteristics. Data processing methods were used in research: average, standard deviation, modus, median. (Bencko, 2002)
- Differential analysis* compares the effectiveness score with the frequency score. The point evaluation of frequency is measure on a scale. This analytical method says that effectiveness is a substitute unit for the customer's expectations of how the company should fare for each quality. The qualities with the greatest differences are then designated as those requiring the most attention.
- Regression analysis* Linear regression was chosen for constructing the regression function. Linear regression is the relationship between two variables, with y as the dependent variable and x as the independent variable. The independent variable is the cause, the dependent variable the effect. This relationship can be described with the equation $y = a \cdot x + b$. It can be stated that if the dependence is drawn, the result is a straight line.
- Factor analysis* has focused on analysis of the structure of internal relationships between a large number of variables and the use of the compilation of a smaller number of latent variables, known as factors. The aim has been to summarize and reduce variables with minimal loss of information. For factor analysis to be conducted, Bartlett's spheric test and the Kaiser – Meyer – Olkinov (KMO) condition must be fulfilled. For better interpretation of data, a rotation of factors was carried out (redivision of the explained variance for individual factors). For rotation the orthogonal rotation method varimax was selected, since the aim was to reduce the number of original variables, and it has been empirically proved that varimax will create burden which can be easily explained (Churchill, 1987). During interpretation of factors, factor burden was examined, which was represented

by a correlation coefficient between the original variable and the factor. Correlations greater than ± 0.5 were considered significant. If any variables did not reach the specified values, they were excluded, and the analysis was carried out again and may have been carried out several more times, until the correlation coefficients of all variables reached the minimum value of ± 0.5 . The purpose of this approach was to obtain an optimal number of variables. The obtained factors were named based on the composition of the variables (Meloun, Militký, 2006).

4 Research evaluation

This chapter presents the results of the studies obtained by primary data collection using the qualitative method. The evaluation of the primary study is divided into four connected parts. The first part is devoted to a presentation of the results using descriptive statistics, especially the results of the effectiveness of personnel marketing tools and the frequency of the use of these tools. The second part involves a differential analysis in which the arithmetic means of effectiveness and frequency are compared. The third part is a regression analysis for both studied variables. At the end, a factor analysis is used to identify the latent factors.

4.1 Identifikace atributů personálního marketingu

This involves comparison of objective use and subjective perception. Therefore the questioning included the most important companies from the Czech Republic across all sectors. In order to obtain relevant responses, the companies were first contacted in person or by phone. This helped establish cooperation with the company's personnel department and helped gain consent for provision of information. The motivation for companies was provision of research results. Most heavily represented among respondents were companies in the automotive industry, which is very widespread in the Czech Republic. A current characteristic of these companies is a shortage of workers and major fluctuation, mainly in the area of production. This shortage is most apparent in regions with high employment. This situation is forcing companies to implement personnel marketing in order to ensure quality human capital.

4.1.1 The effectiveness of the use of attributes of personnel marketing

Table 2: Overview of the effectiveness of personnel marketing attributes

PM tools	Modus	Median	Mean	Sd
7. Targeted recruitment campaigns for specific positions	1	1	1.9	1.428
12. Tools supporting employee satisfaction	1	1	2	1.235
9. Plan for building an employer's corporate culture	1	2	2.6	1.448
11. Welcome package for new employees	1.2	2	2.8	1.757
6. Recruitment at universities	2	2	2.9	1.620
4. Career profiles on social media	1	3	3.2	1.626
8. Separate career WWW pages	2	2	3.3	1.601
2. Research focused on identification of decisive criteria of applicants	3	4	3.4	1.746
1. Analysis of the competition's recruitment strategy	3	3	3.6	1.355
5. Inclusion of game play elements in the recruitment process and communication	2	3	3.9	1.543
10. Video presenting company culture	3	3	3.9	1.252
3. Personal www mobiles	6	4	4.1	1.636
13. BigData	6	4	4.5	1.318

Source: own (1 = maximum effectiveness, 6 = non-effectiveness)

Table 2 presents responses by personnel managers to the question: *How to you rate the effectiveness of individual personnel marketing tools?* This question was scalable, and responses could be assigned values on a scale of 1 to 6, with 1 indicating maximum effectiveness and 6 meaning ineffectiveness. The evaluation included a calculation of the arithmetic mean, variance, mode and median. The evaluation involved all thirteen personnel marketing tools identified in the qualitative study. The tools are arranged by mean, from the most effective tools to the least effective.

For the evaluation, the tools were divided into homogenous groups differentiated by colour. In the evaluation of mode, eight tools were assessed as highly effective, three as moderately effective and two as ineffective. The evaluation is similar for the median, though no tools belong to the third group with values in the <5;6> interval. According to the median, all tools are highly or moderately important. The mean was divided into two parts by the value of 3.5. The first group of effective tools is made up of the first eight tools, while the other five tools rank among the less effective. The standard deviation values indicate that there is great consensus among the respondents. In evaluating effectiveness, only two tools can be labelled as less effective; respondents designate the others as effective.

4.1.2 The frequency of the use of attributes of personnel marketing

Table 3 presents responses by personnel managers to the question: *How often do you use individual personnel marketing tools in your firm?* The evaluated tools were the same as with the question of effectiveness to enable a comparison of the evaluation. The responses were again on the same scale of 1 to 6, with 1 indicating maximum use and 6 meaning that the tool is not used. Descriptive statistics in the form of mean, variance, mode and median were also used for the evaluation. The attributes are arranged by mean, from the most frequently used tools to the least used.

Table 3: Overview of the frequency of use of personnel marketing

PM tools	Modus	Median	Mean	Sd
7. Targeted recruitment campaigns for specific positions	1	1	2.2	1.622
12. Tools supporting employee satisfaction	1	2	2.5	1.701
9. Plan for building an employer's corporate culture	1; 3	3	3.2	1.815
11. Welcome package for new employees	6	3	3.3	2.021
6. Recruitment at universities	1; 3	4	3.4	1.799
8. Separate career WWW pages	6	6	4.1	2.168
2. Research focused on identification of decisive criteria of applicants	6	5	4.2	1.811
4. Career profiles on social media	6	4	4.2	1.903
1. Analysis of the competition's recruitment strategy	6	4	4.3	1.509
10. Video presenting company culture	6	6	4.9	1.601
5. Inclusion of game play elements in the recruitment process and communication	6	6	4.9	1.711
3. Personal www mobiles	6	6	5.2	1.513
13. BigData	6	6	5.4	1.355

Source: own (1 = maximum use, 6 = non-use)

The results of the descriptive statistics are divided in the table into homogenous groups, which are again differentiated by colour. Mode was the first to be evaluated, and the results are extremely contradictory. On one hand, four tools are used to the maximum extent, while nine are almost not used at all. The resulting median is with the two tools used the most, while five tools are used moderately and six tools are not used. The arithmetic mean can be used to divide the tools into two groups. The first five are used with a mean of 3.5, and eight tools are used less with a higher mean. The results of the standard deviation showed that respondents do not agree much on the evaluation of two tools. In general, it can be said that the first five tools are used much more often than the other eight.

A comparison of the descriptive evaluations of frequency and effectiveness indicates that respondents give the effectiveness of personnel marketing tools a better rating. If the order of frequency and effectiveness is compared, there is a slight difference only with tool 4. There is consensus in both evaluations that the weakest tools are 3 and 13. In contrast, the best evaluations for tools 7 and 12 are again identical for both evaluation variables.

4.2 Differential analysis

The evaluation of the differential analysis is presented in Table 4. The basic independent variable is the effectiveness of tools, while the dependent variable is the frequency of the use of personnel marketing tools. The resulting means determined for individual tools are used for the evaluation.

Table 4: Results of differential analysis

Personnel marketing tools	Difference
3. Career sites for display on mobile phones	-1.1
4. Career profiles on social media	-1
5. Incorporating game elements into the recruiting process and communication	-1
10. Video presentation of company culture	-1
13. Big data	-0.9
8. Separate career website	-0.8
2. Research focused on the identification of applicants' decision-making criteria	-0.8
1. Analysis of competitors' recruitment strategy	-0.7
9. Plan for building the company culture of the employer	-0.6
12. Tools supporting employee satisfaction	-0.5
11. Welcome package for new employees	-0.5
6. Recruitment at universities	-0.5
7. Targeted recruitment campaign for a specific position	-0.3

Source: own

The difference is negative for all tools, which means that according to responses from businesses, all tools are used less than their actual effectiveness. A significant difference is when the resulting values are in the <-1; -2> interval. Four tools – 3, 4, 5 and 10 – fall into this interval. The greatest difference is with tool 3. The (0; -1) interval is designated as a slight difference, and the rest of the tools are placed in this interval. In general, it can be said that all of the tools have a negative difference ranging from slight to significant, which is in favour of the effectiveness of the use of the studied tools.

4.3 Regression analysis

The regression analysis was used due to the establishment of the hypothesis: *Businesses use personnel marketing tools based on their effectiveness.* This hypothesis suggests that independent

variable x is effectiveness and dependent variable y is the frequency of the use of personnel marketing.

Or, the use of personnel marketing tools = $a \cdot \text{effectiveness} + b$. To choose the type of regression analysis, a line graph was compiled to reveal the shape of the regression function. The linear regression function was unequivocally chosen for compiling the line graph. The line graph shows a rising trend for the regression line. The model type is additive, with added components. From the perspective of parameters, the choice of the type of regression function is a straight line $\eta = \beta_0 + \beta_1x$, where β the constants are unknown. This is a simple linear regression with just one independent variable x . The statistical evaluation was conducted in Excel, and the data analysis was regression. Figure 1 shows the resulting values.

Figure 1: Regression analysis values

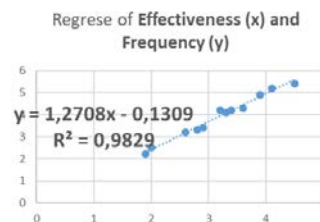
Regressní statistika							
Násobné R	0,982269						
Hodnota spolehlivosti R	0,984528						
Nastavená hodnota spolehlivosti R	0,983058						
Chyba stř. hodnoty	0,136341						
Pozorování	12						
ANOVA							
	Rozdíl	SS	MS	F	Významnost F		
Regrese	1	11,88327878	11,88327878	639,2712972	2,14672E-10		
Rezidua	10	0,185887883	0,0185887883				
Celkem	11	12,06916667					
Koefficienty, Chyba stř. hodnoty, t Stat, Hodnota P, Dolní 95%, Horní 95%							
Hranice	-0,14376	0,166947482	-0,861096433	0,409350882	-0,515740053	0,22822429	
	3,6	1,278574	0,050568867	25,28381492	2,14672E-10	1,165899427	1,391248343

Source: own

According to the table, the presentation of the results can be divided into three parts:

1. The strength of dependence (tightness): the values of the correlation index, determination coefficient, modified determination coefficient, standard error and number of observations are progressively entered in the table named 'Regression Statistics'. According to the value of the correlation coefficient, this is a very strong positive dependency, i.e. the greater the effectiveness, the higher the utilisation rate. According to the determination coefficient, this regression model explains 98% of the variance of the frequency dependent variable.
2. Test of model significance: a single-factor analysis of the variance is used for linear regression to determine the suitability of the model. The results indicate that the model as a whole is statistically significant because significance F (p value $2.14672 \cdot 10^{-10}$) is less than the level of significance $\alpha=0.05$. Hypothesis H1 that the linear regression model is statistically significant can be accepted.
3. Regression model parameters: the table contains regression coefficients, a test criterion for testing the reliability of regression coefficients and regression coefficient reliability interval boundaries. The evaluation shows that the point estimate of an absolute member is -0.1437, and its parameter is not statistically significant because its p value = 0.4093 is greater than the level of significance. The absolute member is therefore not significant and can be eliminated from the model. The point estimate of the regression member is 1.28, and this parameter is, in contrast, statistically significant because its p value is less than the level of significance $\alpha=0.05$, value $p = 2.14672 \cdot 10^{-10}$. An error of the median value, which is the standard deviation of both parameters is the degree of reliability of the estimate. Both values are very low, which means that variability is very low and the reliability of the estimate high. The interval estimate of the absolute member is $\langle -0.515740053; 0.22822429 \rangle$, and the interval estimate of the regression member is $\langle 1.391248343; 1.165899427 \rangle$. In the basic set, the given parameter can take on an value within this interval. The resulting graph, equation and reliability value are presented in Figure 2.

Figure 2: Regression line and regression equation



Source: own

The resulting equation can be interpreted such that by multiplying effectiveness by the value 1.3 and roughly the value 0.13 is subtracted, the estimated frequency of the use of personnel marketing in companies is obtained. It was shown that there is a linear dependency between effectiveness and the frequency of use of personnel marketing. The value of test reliability or the determination coefficient R^2 was very high at 0.98. The result is very close to the value 1, which indicates that the equation is very appropriated for extrapolation. In conclusion, it can be stated that personnel managers are aware of the effectiveness of individual personnel marketing tools and that the established hypothesis can be accepted: *Businesses use personnel marketing tools based on their effectiveness.*

5 Factor analysis

This chapter resolves the third defined objective, which is to uncover latent factors hidden behind discovered attributes with the aid of multi dimensional analysis. For this purpose factor analysis was used, which reduces the dimensionality of data by combining correlated variables into a smaller number of factor variables. The calculation includes attributes stemming from qualitative research, and the resulting variables are referred to as factors. The evaluation of factor analysis is carried out only for effectiveness. The reason is that the evaluation of the effectiveness of attributes can also be perceived as evaluation of importance for which factor analysis is used. However processing and evaluation of frequency based on factor analysis is not suitable and the results would not cover latent factors but would only combine attributes with the same frequency of use. The factor analysis was carried out into rotations. The resulting values are specified in table 5.

Table 5: Factor analysis results

	1st phase	2nd phase	
Cronbach's alpha	0.835	0.702	
95% confidence interval	0.757;0.913	0.545;0.859	
Kaiser-Meyer-Olkinov level	0.722	0.626	
Bartlett's sphericity test	Chi-square tests	193.8	48.53
	Degrees of freedom	78	6
	Importance level	0.0	0.0
The number of variables entering the FA	13	8	
The number of factors	8	2	
Cumulative percentage of variability	0.803	0.587	

Source: own

During the evaluation of effectiveness, Cronbach's alpha has been securely fulfilled, and in both phases it exceeds the value of 0.7 with values 0.835 and 0.702. The structure of the confidence interval involves identifying the interval into which random variables fall with pre-selected high probability $1 - \alpha$, which has been confirmed, since the interval in the first phase amounts to (0.810;0.939) and in the second phase amounts to (0.743;0.928). The condition for achievement of the Kaiser-Meyer-Olkinov (KMO) level is a limit of 0.5 or higher. In the first phase the evaluation is 0.705, and the second phase has a value of 0.714. Bartlett's test of sphericity was also fulfilled in both phases. The

resulting table 5 after two rotations has been added to by a cumulated variable.

Table 6: Resulting matrix of Varimax analysis

Attributes of effectiveness	Factor 1	Factor 2
4. Career profiles on social media	0.386	0.566
5. Inclusion of game play elements in the recruitment process and communication	0.049	0.996
6. Recruitment at universities	0.579	0.334
7. Targeted recruitment campaigns for specific positions	0.880	0.083
9. Plan for building an employer's corporate culture	0.820	0.162
12. Attribute supporting employee satisfaction	0.968	0.242
The cumulated variability	0.478	0.731

Source: own

In the factor analysis, attribute 10 was removed (since it does not have a statistically significant burden), as were attributes 1, 2, 3, 8, 11 and 13 (which have statistically important burdens in factors where there are no other variables). The result was six attributes divided into two factors, which ensured 73.1% cumulative variability. Following evaluation of factor analysis, the factors were renamed. The names of the factors were based on group evaluation, which was participated in by specialists in marketing and HR professionals.

Factor 1: Existence of personnel strategy

Factor 2: Recruitment of top management

The calculations made it possible to identify and name two factors and thus uncover latent factors hidden behind discovered attributes, which was the third aim of the contribution. These two factors explain 73 % of the variability, which for presentation of results is a very good condition. This is followed by an explanation of individual identified factors.

The first factor, which is the existence of a personnel strategy, consists of four attributes and from overall variability of effectiveness it explains 47.8 %. The factor can be explained as follows: *The personnel strategy makes it possible to plan and direct all work with human resources with consideration for the company's overall strategy in the long-term.* The personnel strategy includes all processes, programs and measures related to employment of persons, the acquisition, selection and stabilization of employees, their further training and, rewarding and career growth. This is followed by an explanation of the connection of the factor with individual attributes from which the factor is comprised:

The first attribute is *recruitment at universities*, which is a mean of obtaining employees from external sources. This attribute has a long-term impact on the quality of human capital in a company and is clearly part of the personnel strategy.

The second attribute, *targeted recruitment campaigns for specific positions*, was evaluated in the research as the most effective attribute. Targeted recruitment campaigns are part of the process of acquiring workers for positions on the labour market. These recruitment campaigns have a long-term character and because of their contents they belong to this factor.

The third attribute, *the plan for building company culture of an employer*, consists of decision processes, problem solving in the organization and behaviour in a superior's relationship with a subordinate. The creation of company culture has a long-term impact and is part of the long-term personnel strategy.

The fourth attribute, *tools supporting customer satisfaction*, defines the method of management of work performance, motivation and rewarding of people, social programs and employee benefits. If a company focuses on tools supporting

satisfaction over the long-term, they will become part of the personnel strategy.

The second factor, which is the recruitment of top management, consists of four attributes and from overall variability of effectiveness it explains 25.3 %. The factor can be explained as follows: *In each company there are key work positions which are different from each other based on the sector in which the company does business. For all companies with the traditional organizational structure however top management is a key work position, and the persons in it make strategic decisions. Recruitment for top management is usually a multi-round process which involves thorough verification of information.* This is followed by an explanation of the connection of the factor with individual attributes from which the factor is comprised:

The first attribute, *career profiles on social media*, is currently most often connected with the professional social network LinkedIn, which is connected with the terms e-recruitment and headhunting. Places appropriate for searching for potential employees include professional social networks such as LinkedIn and ResearchGate and at present also personal social media such as Facebook, Google plus and Twitter.

The second attribute, *inclusion of game play elements in the recruitment process and communication*, is most often applied during recruitment of top management. The use of game play elements during the selection of employees ("gamification") has many forms and combines findings from game design, traditional marketing and behavioural psychology. It uses the principles of acquiring points, overcoming challenges, and it encourages competition and motivates for continuation. It is the implementation of the gaming system in practice which has major importance for recruitment of employees for key positions in top management.

6 Discussion

As Bednár (2013) states, personnel marketing tools can be divided into five groups. The conducted study did not confirm this division. Personnel managers do not need to divide tools in this manner and prefer dividing them into those that are effective and those that are ineffective. It is possible instead to agree with the opinion of Vysekalová, Stýblo and Urban (2011) that personnel marketing tools are all those that lead to the retention or recruitment of employees that have high personal quality and are loyal to the employer. Armstrong (2015) and other authors claim that the foundation of any activity in the company is achieving strategic compliance, i.e. the agreement of the overall company strategy and the HR strategy. This hypothesis was confirmed by the study thanks to a factor analysis in which the 'existence of a personnel strategy' was the strongest factor explaining nearly 48% of variability. Koubek (2015) states that in work with human capital it is necessary to focus on key positions in the company. The study identified that personnel managers view top management as key positions in contemporary companies. This fact was revealed by a factor analysis in which social media, both professional and personal, were included among personnel marketing tools. Game elements that the study included in personnel marketing could also be used to recruit these key employees. In his work on personnel marketing, Menšík, (2015) states that the most effective tools are want ads in print or on the internet, career micro-sites, open houses, the hiring process, the internal communication style and company events. The presented study refutes this opinion and lists completely different personnel marketing tools. This difference is the result of the changing perception of personnel marketing by HR workers.

Conclusion

The article is part of a project that addresses the current use of personnel marketing in the Czech Republic. Three objectives were established, and these were accomplished by a primary study and a statistical evaluation.

The first goal was to determine the effectiveness of personnel marketing tools and their frequency of use. The goal was accomplished by the primary study followed by a detailed statistical evaluation using descriptive statistics. From the perspective of the effectiveness of tools, it can be asserted that the first seven tools are rated as very effective by companies. On the other hand, two tools are rated as ineffective. The evaluation of the frequency of use of personnel marketing showed that only two tools are used to the maximum extent in all surveyed companies. In contrast, there are considerably more personnel marketing tools that are not used. All together, there are nine tools that are virtually unused in the area of personnel management today. In general, it can be said that the first goal was accomplished and the results can be used primarily in practice. Personnel managers can introduce the most effective tools into their HR strategy.

The second goal was to investigate the relationship between the frequency of use of personnel marketing tools and their effectiveness due to the incongruence between both indicators. The study employed two evaluation methods – differential analysis and regression analysis. Differential analysis showed a significant difference with four personnel marketing tools. Higher effectiveness than frequency of use was found with all personnel marketing tools. Since differences between the effectiveness and frequency of use of personnel marketing were identified, a regression analysis was conducted. This clearly showed that personnel marketing tools identified by companies are assigned a higher effectiveness than their current use. A linear dependency between effectiveness and the frequency of use of personnel marketing was also demonstrated. The final response for the second goal is that companies and their HR departments are aware of the great effectiveness of the determined personnel marketing tools but they have not yet been implemented for indefinite reasons. Although companies use personnel marketing tools correctly according to their effectiveness, their use is not as frequent as HR workers would imagine. There are multiple reasons for this, including fear of introducing innovative marketing approaches in the HR department or a lack of knowledge and fear of new trends. In any case, there is an assumption that the determined personnel marketing tools will be used more often due to the increasing difficulty in recruiting employees in a period of economic growth with labour shortages. Low unemployment rates cause competition for employees among companies. Personnel marketing tools are a possible solution to these problems.

The third goal was uncovering latent personnel marketing tools. A factor analysis with two rotations was conducted to accomplish this goal. The result was two factors named after the tools from which the factor was composed. While these two tools, the 'existence of a personnel strategy' and 'recruitment of top management', are of a more general nature, they are absolutely essential. Factor 1, the existence of a personnel strategy, is essential for the implementation of personnel marketing and should include the determined personnel marketing tools. The second determined factor is also comprehensive and recommends the use of identified personnel marketing tools for the recruitment of key employees. The study showed that personnel managers using personnel marketing rank top management as key employees.

There are two main benefits of the work: the first is purely practical, i.e. the possibility to offer a complex solution to companies and their HR departments in the form of introducing personnel marketing. Today, when the lack of quality human capital hampers the economy, personnel marketing offers a possibility for dealing with this situation on the labour market. While it is not possible to claim that personnel marketing is the only remedy for stabilising employees or for recruiting new employees, it is certainly an appropriate supplement. Personnel marketing is different in that it views employees as customers, thus changing the role in traditional HR work.

The second benefit of the presented work is theoretical: it is the first in the Czech Republic to present specific personnel marketing tools as perceived by personnel managers. The work also evaluates these tools from the perspective of effectiveness and their frequency of use, and even uncovers latent factors. There is great space in the theoretical area for additional study of the development of personnel marketing, and this work can serve as an information foundation for further research. In conclusion, it is possible to state that personnel marketing is a field of the future and this work can be a starting point to this interesting issue. In the future it will be interesting and even necessary to elaborate the identified attributes, perhaps even dividing them further, and to determine their effectiveness in practice.

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Primary Paper Section: A

Secondary Paper Section: AH

RELATIONAL CAPITAL AND KNOWLEDGE TRANSFER AS THE SOURCES OF BUSINESS COMPETITIVE ADVANTAGE

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Abstract: The paper is an extract of a study conducted as part of a larger university project. The thesis set within the research assumed that the relational capital and knowledge transfer have a significant impact on building the competitive advantage of a business. The studies carried out with the use of literature search and case study analysis methods, focused on the relationships between businesses and suppliers. The tools affecting the open and concealed knowledge flow in the relational capital were identified and an attempt was made to determine the role of the relational capital in building the competitive advantage of a business. The publication includes explanation of correlations between the relational capital and knowledge transfer.

Keywords: knowledge transfer, open knowledge, concealed knowledge, relational capital, knowledge transfer tools.

1 Relational capital vs. knowledge transfer

Knowledge functions as a term without any unambiguous definition, although there have been numerous attempts to reach consensus. It is commonly interpreted as all the information gained thanks to research, learning and as information resource in specific field.

The ancient philosophers – Plato and Aristotle – were the first who attempted to define the notion of knowledge – their considerations initiated the rationalistic (based on the mental processes) and empirical trend (based on sensual experiences) in the science about knowledge. The contemporary sources indicate the important role of philosophy in defining the notion of knowledge¹.

Furthermore, there are numerous interpretations of the notion as information (data) depending on the level of understanding and the context² indicating at the same time that interpretation of knowledge in a way that reduces it to information only is erroneous, without limitation, due to the necessity for processing the information, but also due to the existence of correlation between knowledge and other factors, such as experience, teaching process or observation³.

Nonaka – the author of the statement „new knowledge always begins with the individual”⁴ – points out the manager’s intuition, which, combined with the concept, becomes the catalyst of a new idea and this will result in contribution to the creation of a new product. This kind of reasoning leads to a conclusion that it is the personal knowledge subjected to transfer that becomes the foundation of the organisational knowledge, which constitutes an invaluable asset for a business. It is worth noticing that the knowledge of individuals is created in the process of education and upbringing, supplemented by the use of other forms of instruction (courses, training sessions, etc.). This means that each organisation possesses a knowledge resource to be used depending on knowledge management with the use of efficient tools allowing for complete application of the concealed resources being at the disposal of a business.

From an entrepreneur’s point of view, knowledge is undoubtedly an invaluable capital and skilful creation and appropriate management of knowledge is an indispensable condition to assure development and building competitiveness of an

organisation (cf. Opolski K.(red.), *Doskonalenie jakości w bankach*, CeDeWu, Warszawa 2002, 13 p.)

The literature in numerous cases refers to the division into concealed (silent) knowledge characterised with intangibility, identified with experience and education of specific individuals and evidenced, systemised form of knowledge, called open (formal) knowledge⁵.

The transfer of concealed knowledge to open knowledge is called the knowledge creation process contributing to transformation of action plans, organisational structure and in effect, implementation of innovative technologies or products, brings about the modified image and development of a business⁶. There are numerous definitions of knowledge transfer in the literature. The definition offered by Bednarek is worth attention: „it is a regular, distinct and reasonable creation, renewal and application of knowledge to maximise the knowledge of organisation, knowledge related to efficiency and improvement of organisational value”⁷. Another definition was formulated by Mladkova who pointed out in her paper the correlation between knowledge management and taking up conscious actions leading to appropriate knowledge possessed by appropriate people in appropriate time and reference to the organisation’s demands⁸. Trautman presented a similar definition⁹.

The overview of the definitions leads to a conclusion that information exchange is the foundation for knowledge management strategy in an organisation and it can be based on the 5-stage model by Noaka or transmission and absorption¹⁰. Both forms of transfer will represent the relational capital.

The correctly formulated and maintained relationships with external entities form an indispensable element of building the competitive advantage of a business (cf. Porada-Rochoń M. (editors), *Restrukturyzacja przedsiębiorstw w procesie adaptacji do współczesnego otoczenia. Perspektywa międzynarodowa, [Restructuring of a business in the process of adaptation to contemporary environment. International perspective]* Difin, Warszawa 2009; Urbanowska-Sojkin E., *Zarządzanie strategiczne przedsiębiorstwem, [Strategic Management of a Business]* Polskie Wydawnictwo Ekonomiczne, Warszawa 2004). This is related to the necessity for mutual co-operation between entities and for creation of a network of links to the potential customers, suppliers, business partners and competitors of a business. Building the proper relationships among the employees of an organisation is also of particular significance here. The relationships appropriately constructed improve the knowledge flow process, but they also enable access to the necessary knowledge resources¹¹. The existence of relationships is not the unambiguous determinant of the competitive success. The maintenance of co-operation between the entities, based on

⁵ Dziuba D., *Gospodarki nasycone informacją i wiedzą. Podstawy ekonomiki sektora informacyjnego*, Uniwersytet Warszawski, Warszawa 2000, 58 p.; Wrycza S., *Informatyka ekonomiczna. Podręcznik akademicki*, Polskie Wydawnictwo Ekonomiczne, Warszawa 2010, 457 p.

⁶ Nonaka I., *Knowledge Creating Company*, „Harvard Business Review”, 101 p.

⁷ Bednarek M., *Doskonalenie systemów zarządzania, Nowa droga do przedsiębiorstwa lean*, Difin, Warszawa 2007, 46 p.

⁸ Sarka H., Tools of Internal Communication from Knowledge Transfer Perspective. *Journal of Competitiveness*. Vol. 6, Issue 4, pp. 50-62, December 2014, 52 p.

⁹ Trautman S., Knowledge Transfer. Preserving Your Secret Sauce. http://cdn2.hubspot.net/hubfs/1663920/White_Paper_-_Preserving_Your_Secret_Sauce_-_The_Steve_Trautman_Co..pdf?_hssc=208992205.3.1507269139272&_hstc=208992205.762e7e00809f9122815782dc9b8dd9e.1507269139271.1507269139272.1507269139272.1&_hsfp=2383892897&hsCtaTracking=12129590-847b-482c-b823-227c886cc194%7C2a3806b0-ba1f-4d6a-a98f-47a4f6094a4f; 6.10.2017, 4 p.

¹⁰ Zhou, A. and Fink, D., The Intellectual Capital Web: A Systematic Linking of Intellectual Capital and Knowledge Management. *Journal of Intellectual Capital*, 2003, 4, 34-48, 43 p.; Łopusiewicz B. (red.), *Zarządzanie wiedzą w systemach informacyjnych*, Wydawnictwo Akademii Ekonomicznej, Wrocław 2004, 92 p.

¹¹ Hormiga E., Batista R., Sánchez A. *The role of intellectual capital in the success of new ventures*. *International Entrepreneurship Management Journal*, 7(1), s. 71-92, 2011.

¹ Jashapara A., *Zarządzanie wiedzą*, Polskie Wydawnictwo Ekonomiczne, Warszawa 2006.

² Watson I., *Applying Knowledge Management. Techniques for Building Corporate Memories*, Morgan Kaufmann Publishers San Francisco 2003, 7 p.

³ Dziuba D., *Gospodarki nasycone informacją i wiedzą. Podstawy ekonomiki sektora informacyjnego*, Uniwersytet Warszawski, Warszawa 2000, 45 p.

⁴ Nonaka I., *Knowledge Creating Company*, „Harvard Business Review”, 97 p.

mutual trust, exchange of tangible and intangible assets with the environment are necessary here¹².

The studies on the relational capital indicate that the quantity and quality of knowledge acquired by a business depends on three basic dimensions of the relational capital with the partners: the level of trust, the level of transparency of relationships between the entities and frequency of interactions¹³. The formation of relationships between the entities and the knowledge acquired in the process of building such relationships affects such functional aspects of a business as adaptation of the offer to the market, personalisation of contacts and integration of business processes with the customers, suppliers, business partners and the employees¹⁴.

1.1 Tools indicating the transfer of knowledge of the relational capital

Building the strategy of a business is based on determination of what kind of knowledge is its strategic asset, analysis whether its use is able to assure advantage on the market and then indication of key skills that must be possessed in order to use knowledge. Another stage is the verification and adaptation of processes and technologies supporting the organisational structures and formation of a knowledge caring culture. Information shall also affect the improvement of the organisation's attractiveness. The key aspects in this case shall include knowledge awareness and its appropriate transfer, focus on core business activity and organisational culture¹⁵. The said factors, however, do not represent a closed catalogue, therefore, some more extended catalogue of knowledge transfer tools appear in the literature (cf. Gomółka Z., *Doskonalenie funkcjonowania organizacji, [Improving the functioning of an organisation]* Difin, Warszawa 2009 oraz Opolski K. (red.), *Doskonalenie jakości w bankach [Improving Quality in banks]*, CeDeWu, Warszawa 2002).

The analyses of studies on knowledge transfer indicate the necessity for development and improvement of tools affecting the knowledge transfer. They also indicate the immense significance of training and the use of new technologies¹⁶ as well as migration of human resources, e.g. between departments of a business¹⁷.

The results of studies carried out in Poland show that 80% of the businesses surveyed motivate their employees to share their knowledge and experiences, in spite of the fact that this is related to substantial restrictions (strong competition among the employees, particular departments and low awareness of benefits offered by knowledge sharing). Moreover, it was observed that 55,33% of the entities surveyed do not use coaching and mentoring. Only 5,33 % of the businesses regularly use meetings as knowledge transfer and only 14,67% businesses internal training courses are regularly conducted (in 51,34% they were conducted sporadically or were not conducted at all). It was also noticed that the organisations do not apply systems facilitating

internal communication (only 19,33% businesses had such systems)¹⁸.

The analyses clearly indicate the incorrect use of knowledge in businesses, due to the incorrect approach to consolidation and dissemination of knowledge (cf. Łychmus P., *Coaching oparty na wiedzy [Knowledge-based Coaching]*, C. H. Beck, Warszawa 2010, 106-110p.).

The study results show the necessity for skilful construction of relationships between a team members, the appropriate selection of the managerial staff¹⁹ and the advantage of the tools based on interactions between the employees.

The tools based on the use of new technologies (conference-calls, e-mail exchange, intranet, on-line conferences) primarily used in international businesses where direct contact is difficult²⁰ which proves the permanent extending of the transfer tools catalogue.

1.2 Competitive advantage

The theoretical considerations and studies carried out in the scope of competitiveness contributed to the formulation of a few theories concerning this phenomenon. The first – Porter's theory – was based on the co-existence of five forces: supplier power, buyer power, threat of substitution, threat of new entry and competitive rivalry²¹. Another – Hamel and Prahalad's theory – is based on the resources where the main competitiveness source is the effect of unique resources of a business²².

The studies on the competitive advantage indicate the direct correlation between knowledge and its effective distribution among the entities, including without limitation efficiency of the organisation or cost reduction²³. At the same time it is indicated that knowledge without the relational capital or abilities to learn will never constitute a sufficient tool allowing for building strong advantage on the market. The competitive success of a business is in the skilful use of dependencies existing between the assets²⁴.

2. Selection of case studies

The case study method was used in the research. As a result of the interviews with the managers and HR Management staff members, information was acquired on the solutions and tools affecting the transfer of open and concealed knowledge within a business and between the business and the entities it co-operates with. Moreover, an attempt was made to diagnose the restrictions of knowledge transfer and identification whether there is a correlation between knowledge transfer and building the relational capital and between knowledge transfer and the competitive advantage of a business. It was verified whether businesses apply coaching or/and mentoring to consolidate the knowledge transfer. Businesses from the construction,

¹² Chomiak-Orsa I., *Zarządzanie kapitałem relacyjnym w procesie wirtualizacji organizacji. Podejście modelowe*, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2013, 110 p.

¹³ Sawhney M., Zabin J., *Managing and Measuring Relational Equity in the Network Economy*. Journal of the Academy of Marketing Science. Vol. 30, nr. 4., 2002, 237-238 p.

¹⁴ Kohtamäki M., Vesalainen J., *Supplier-customer cooperation, relationship development and supplier's profitability*. <https://www.researchgate.net/publication/242689499>. 2014, 319 p.; Trautman S., *Knowledge Transfer. Preserving Your Secret Sauce*. http://cdn2.hubspot.net/hubfs/1663920/White_Paper_-_Preserving_Your_Secret_Sauce_-_The_Steve_Trautman_Co..pdf?_hs_sc=208992205.3.1507269139272&_hstc=208992205.762e7e00809ff91228f5782dc9b8dd9e.1507269139271.1507269139272.1507269139272.1&_hstsp=2383892897&hsCtaTracking=12129590-847b-482c-b823-227c886cc194%7C2a3806b0-ba1f-4d6a-a98f-47a4f6094a4f, 6.10.2017, 51 p.

¹⁵ Gomółka Z., *Doskonalenie funkcjonowania organizacji*, Difin, Warszawa 2009, 43-44 p.

¹⁶ Tabaszewska E., *Nowoczesne koncepcje zarządzania – wyniki badań*, Wydawnictwo Akademii Ekonomicznej, Wrocław 2007.

¹⁷ Zimmermann A., Ravishankar M.N., *Knowledge transfer in IT offshoring relationships: the roles of social capital, efficacy and outcome expectations.*, *Info Systems Journal* (2014) 24, 167–202, 81-92 p.

¹⁸ Mikula B., Makowiec M., *Strategiczne zarządzanie wiedzą w małych i średnich przedsiębiorstwach*, Zeszyty Naukowe, Uniwersytet Ekonomiczny w Krakowie 2009, nr 801, 47 p.; Świtalski M., *Wiedza i bariery jej transferu w polskich przedsiębiorstwach*, [w:] *Zarządzanie wiedzą i informacją w społeczeństwie sieciowym*, t. 2, red. M. Morawski, Prace Naukowe Wałbrzyskiej Szkoły Zarządzania i Przedsiębiorczości, Wałbrzych 2003, p. 19-48.

¹⁹ Watson I., *Applying Knowledge Management. Techniques for Building Corporate Memories*, Morgan Kaufmann Publishers San Francisco 2003, 256 p.; Sarka H., *Tools of Internal Communication from Knowledge Transfer Perspective*. *Journal of Competitiveness*. Vol. 6, Issue 4, pp. 50-62, December 2014, 41 p.

²⁰ Argota L., Ingram P., *Knowledge Transfer: A Basis for Competitive Advantage in Firms*, *Organizational Behavior and Human Decision Processes*, Vol. 82, No. 1, May, pp. 150–169, 2000, 171-177 p.

²¹ Hamel G., Prahalad C.K., *The Core Competence of the Corporation*, Harvard Business Review, no. 5/6. 1990, 19 p.

²² Szymura-Tyc M., *Zasoby oparte na wiedzy w procesie budowy przewagi konkurencyjnej przedsiębiorstw.*, *Przeгляд organizacji 3/2002, s. 7-11*, Warszawa, 79 p.

²³ McNeish J., Jit Singh Mann I., *Knowledge Sharing and Trust in Organizations.*, *The IUP Journal of Knowledge Management*, Vol. VIII, Nos. 1 & 2, 2010, 308 p.; Sawhney M., Zabin J., *Managing and Measuring Relational Equity in the Network Economy*. Journal of the Academy of Marketing Science. Vol. 30, nr. 4., 2002.

²⁴ Yli-Renko H., Erkkö A., Sapienza H., *Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms*. *Strategic Management Journal* 22: 587–613, 2001., 156 p.

pharmaceutical, food and insurance sectors participated in the study. The selected (four) cases of large businesses operating on the Polish market will be hereinafter presented.

2.1 Case study of a business from the construction sector

The business is an Austrian distributor of automation, manufacturer of electro-mechanical elements with almost 50 years of experience in the construction sector.

The open knowledge flow in the business is carried out mainly by e-mail. The dispersed organisational structure (branches in various regions of the country) does not facilitate transfer of all the information. Other knowledge flow restrictions have also been identified in the organisation, they include without limitation:

- the lack of procedures concerning information flow / feedback from the customers – in consequence, the sales personnel often receive the information too late;
- inaccurate structure of the messages;
- the lack of video-conferences;
- the lack of standards and erroneous assumptions concerning knowledge transfer;
- insufficient knowledge transfer between the management board and a division (restricted information concerning the management board's expectations towards the divisions and employees).

Particularly, the latter restriction causes a conviction among the employees that there are difficulties with their self-development, thus, contributing to the increase of distance between the managers and the employees. No substantial measures to improve the knowledge flow in the business have been indicated, either. The coaching approach is only used in customer service, while neither coaching nor mentoring is used for improvement of knowledge flow.

To acquire the concealed knowledge from the employees, staff meetings are organised twice or three times a year, then they have an opportunity to share their remarks. Currently such meetings are of low effectiveness. This is the result of low trust of the employees, translated into the lack of commitment during the meetings. The management board in Poland encounters difficulties with building a bond between the employees. The main variable contributing to concealed knowledge transfer is the self-motivation of the employees. The management board is aware that the level of flow and use of knowledge resources in the business impacts building of the relational capital. The latter, in turn, depends on the level of trust and motivation for action among the employees.

E-mail and telephone contact are primarily used for open knowledge flow between the business and external entities. Moreover, meetings, presentations and annual visits to an external entity by the business representative are organised.

To acquire concealed knowledge, direct conversation focused on open questions is used. Furthermore, there is no electronic customer service system (CRM) in the organisation, nor the sales people activity is controlled. Their activity is verified at the end of the financial year, which results in delayed response to the performance results. The business does not monitor the employees' actions on an ongoing basis. The employee is granted a high level of trust, but he also bears high responsibility. If there are any cases of misunderstanding as a result of restrictions concerning knowledge flow between the organisation and the partner (customer) during the order processing, an attempt to settle the same is immediately made. In this way the customers do not usually lose trust towards the knowledge transferred to them.

The knowledge flow in the business does not build competitive advantage. The correct flow of knowledge, however, assures time and money saving and reduces the risk of occurrence of frustrating situations resulting from misunderstanding. Moreover, a precise information flow contributes to solving

issues, constructive discussions and negotiations as well as elaboration of consensus consolidating the relational capital between the parties. The lack of knowledge or its incorrect flow, in turn, impedes building of the relational capital. It is best illustrated by the case of service repair operations where the knowledge transfer is poorer causing poorer relationships.

The relational capital positively impacts the knowledge flow between the parties. However, it has been observed in the organisation that it depends on the size of the city the partner (customers) comes from. In smaller towns with high competition, the relational capital is poorer, information exchange is reluctant, contrary to larger metropolitan areas with larger reach of the organisation, the knowledge transfer is higher and at the same time stronger relational capital.

2.2 Case study of retail network from the pharmaceutical sector

The business represents the pharmaceutical sector. It is among the largest networks of pharmacies in Poland. It puts high stress on the transfer of open and concealed knowledge. For this purpose it uses a number of solutions supporting its flow. The following tools are used for open knowledge flow in the organisation:

- internet platform presenting e.g. reports on the performance of particular pharmacies; information on e-learning courses available to the employees; information on discounts granted by the manufacturer for purchases by a pharmacy;
- e-mail: reports on the performance of particular pharmacies and business news are transmitted to the inbox; the pharmacies communicate with one another by email; they also announce information on any legal changes by email.
- Regional Manager's visits to the pharmacy;
- training courses for pharmacy managers.

In order to acquire concealed knowledge from employees the following tools are used:

- surveys (e.g. surveys concerning perception of the closest competitors);
- surveys ending e-learning courses – after completion of an e-learning course the employee provides his/her assessment of the course, has an opportunity to add commentary and his/her own remarks;
- recently a group on the internet platform has been formed (for employees willing to join) in which the employees may exchange their ideas, e.g. on what can be improved in the business, they have an opportunity to suggest their own solutions.

The following carriers are used for open knowledge flow between the organisation and the entities it co-operates with:

- computer programme thanks to which the pharmacy may check which wholesalers have the drugs its needs available (it is particularly important in case of scarce pharmaceuticals) as well as the prices offered by specific wholesalers, which allows them to make the best purchase;
- e-mail – some commercial offers are sent directly to the e-mail address.

In spite of the numerous tools and solutions improving knowledge transfer, some difficulties in its flow are identified. The most frequent restriction lies in the technical problems that impede the functioning of the internet platform. The delays in publication of information on the internet platform are reported to be the second restriction.

The business takes measures to eliminate the restrictions. For this purpose:

- a list of contacts has been created thanks to which the employees know the contact persons in case any issue occurs;

- some rules and set of procedures have been developed for specific situations, which all the employees had to become familiar with and confirm the same with their own signatures;
- training courses for pharmacy managers are organised.

The knowledge flow is also of key importance in the context of building the relational capital that positively affects the consolidation of the competitive advantage. It is of vast importance in case of a pharmacy. The good relationships with the suppliers, manufacturers and wholesalers enable the pharmacies to obtain supplies at lower prices and provide them with an opportunity to negotiate longer maturity periods. If a pharmacy has good relationships with the wholesalers, it will be easier for it to acquire some scarce goods. If a pharmacy is well supplied and offers low prices, it becomes more attractive.

The relationships that the pharmacy staff members have elaborated with the customers are of crucial importance. Well trained and competent pharmacists with professional approach to the patient cause that people visit their pharmacy willingly. The operations of pharmacies are strictly regulated. At present advertising of pharmacies is prohibited. In the case of this sector building the relational capital will immensely affect the competitive advantage.

2.3 Case study of a business form food sector

The manufacturing business from the food sector with Italian capital was established in the 1940's. It has been operating on the Polish market since 1990's. The product range manufactured in Poland reaches more than 50 countries worldwide.

The open knowledge from the employees is acquired by the business via e-mail, corporate portal, iOS application, knowledge base, training courses – internal and external, as well as informal meetings at a cup of coffee. Internal training courses are also used as a tool to obtain concealed knowledge. Moreover, the formalised knowledge is used for this purpose and procedure, action and process manuals are developed.

The open knowledge flow between the organisation and the entities it co-operates with is carried out through official forms and documents, e-mail messages, meetings with business partners, telephone calls, and through the Facebook fanpage, website, advertising, information booklets, training courses and materials to be used in points of sale. To obtain concealed knowledge from the entities the organisation co-operates with, it carries out surveys and consumer studies and analyses the results looking for "bottlenecks" and analyses of sales of particular product ranges.

The correct knowledge flow in the organisation impacts the competitive advantage. An efficient flow of knowledge enables timely response to the market stimuli. Moreover, it enables internal analyses that in consequence lead to preparation of alternative measure scenarios. The business pays great attention to knowledge flow, because the lack of it impedes fast response to the market situation and even puts the brand reputation at risk. The organisation is aware of the benefits of fast identification of difficulties with knowledge flow. Such difficulties include transfer of excessive information, directing information to people unrelated to an issue, delayed transfer of information to the person performing a task (holding information at a certain stage) and deformation of messages announced.

In order to break the said restrictions in knowledge flow, training courses for the employees are organised on communication, assisting to identify the system deficiencies and representing a common attempt to present suggested changes. The consumers, in turn, or co-operating entities are requested to present as many details as possible concerning their enquiries (it happened that a customer mentioning a product name only wanted to report a complaint, but he/she did not want to provide any exact details, according to which the product could have been identified and

checked with the factory control samples). In addition, coaching is used to induce the knowledge flow in the organisation.

The business emphasises that taking up measures aimed at assuring efficient knowledge flow is in as much important that it affects the competitive advantage and building of the relational capital at the same time. It enables adaptation to the market and implementation of fast responses to the stimuli coming from it. Customers loyalty and relationships with them are immensely significant in the FMCG sector. Well-formed quality and reputation of the product are of crucial importance and thanks to maintenance of the relational capital among the customers it may become even more consolidated (thanks to, without limitation, the regular feedback on the products).

With its high awareness of the relational capital rank, the organisation builds and maintains it on several levels:

- internally;
- organisation – co-operating entity;
- organisation – end-consumer. This relationship is recognised as one of the more important ones, because it builds trust and offers an opportunity to get immediate response to the going on processes. Between the product and brand a network has been built based on continuous mutual sustaining of the relationships.

The relational capital significantly affects the organisation's competitive advantage. Through the direct commitment of the consumer into the relationship with the manufacturer with the use of social portals and organised events, it allows for dynamic adaptation of the quality of generated messages and products to their requirements.

2.4 Case study of an insurance company

The business has more than 100 years of tradition, member of international insurance-financial group. It has been providing insurance and receivable collection services on the Polish market for almost 20 years.

For open knowledge flow inside the organisation e-mail has been mainly used. Sometimes information posters displayed in various parts of its office are used. The business as a rule tries to explain its decisions (even though they are unfavourable to some of the employees), as the same time consulting them and explaining their consequences. Such an attitude positively affects the employees. It is a symptom of positive impact of knowledge flow on building the relational capital in the business. In order to enhance the knowledge flow in the organisation, mentoring is offered to the employees. It is primarily directed to the employees diagnosed as talents, to the group of people included in a faster professional career development path, also to people employed as trainee programme participants.

Taking up measures aimed at improving the knowledge flow is in as much significant that the business builds its image and industry leader position on a fast and efficient information flow. Simultaneously there are certain difficulties concerning knowledge flow. One of them is the lack of full and overall transfer. The knowledge transferred is frequently unnecessarily dispersed and its transfer is distributed in time, which causes guesses and rumours, which in turn, negatively affects the employees. In spite of the measures taken, it is difficult to break through the restrictions.

The open knowledge flow between the organisation and the entities it co-operates with is carried out mainly through official correspondence sent by traditional post and e-mail. In order to acquire concealed knowledge from the entities it co-operates with, the business uses tools especially elaborated for this purpose. The organisation has its own business intelligence unit. Through monitoring the market it collects numerous important pieces of information from various sources. An example is the PMI (Payment Morality Index) test of the business, which

enables us to gather information from the suppliers of a specific entity.

Efficient knowledge flow is significant not only in the context of internal organisation functioning, but also due to the relationships with the external environment. Due to the specific nature of business, fast responding and informing their business partners, it impacts the relationships and image of the business in a very positive way. It is the relational capital that the business builds its leader positions and generates more and more income thanks to it.

3 Summary

In this part of the study an attempt has been made to explain the relationships between the relational capital and knowledge transfer in the enterprise. Both literature search and case study analysis indicate that there is a strong correlation between the relational capital and knowledge transfer, both the open and concealed one. The identification of tools affecting the knowledge transfer in the relational capital also indicated the modern communication channels, such as e-mail, applications facilitating information exchange and communication, or knowledge base platforms for accumulation and transfer of knowledge, both inside the business and between the business and the co-operating partner. Both literature studies and case studies, however, emphasise the importance of personal meetings (conferences, training courses, direct contact with the customer). Even the physical distance bringing about transaction costs does not seem to be an impediment to investing in the relational capital. It is built both locally and globally. The survey respondents show high awareness of importance of relationships to building the competitive advantage on the market, which also was an element of the studies. In this case, like in the case of literature search and interview analysis, the impact of the relational capital on building the business competitive advantage has been observed.

The high cohesion, noticeable homogeneity of responses in the interviews being one of the elements used in structuring the case studies, disregarding the sector of a business, is a signal that the studies need to be continued. At the further stage, it seems right to carry out quantitative surveys of businesses in various industries.

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Primary Paper Section: A

Secondary Paper Section: E

B PHYSICS AND MATHEMATICS

BA	GENERAL MATHEMATICS
BB	APPLIED STATISTICS, OPERATIONAL RESEARCH
BC	THEORY AND MANAGEMENT SYSTEMS
BD	INFORMATION THEORY
BE	THEORETICAL PHYSICS
BF	ELEMENTARY PARTICLE THEORY AND HIGH ENERGY PHYSICS
BG	NUCLEAR, ATOMIC AND MOLECULAR PHYSICS, ACCELERATORS
BH	OPTICS, MASERS AND LASERS
BI	ACOUSTICS AND OSCILLATION
BJ	THERMODYNAMICS
BK	LIQUID MECHANICS
BL	PLASMA PHYSICS AND DISCHARGE THROUGH GASES
BM	SOLID-STATE PHYSICS AND MAGNETISM
BN	ASTRONOMY AND CELESTIAL MECHANICS, ASTROPHYSICS
BO	BIOPHYSICS

THE METHOD FOR ANALYZING THE STABILITY OF THE PHASE FORMER OF PROBING SIGNALS OF THE ELECTRO-LOCATING INSTALLATIONS IN THE GEODYNAMIC CONTROL SYSTEMS

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Abstract: The paper notes that sensitivity and accuracy of geodynamic control can be increased by using of the phase methods of forming of the probing signals. However, this leads to a decrease in noise immunity (the influence of the multiplicative interference), as well as to the possible loss of feedback stability when registration of the geodynamic trend. It is necessary to ensure the stability of the signal formers to variations of the installation parameters and the impact of interference. It will ensure the reliability of the functioning of the phase-measuring systems of geodynamic control. The application of the generalized model of amplitude-phase formation and transformation of the signals is substantiated. This model will allow analyzing the stability of the blocks of adaptive forming of the signal in the geodynamic control systems based on multi-pole electrical installations. A new method and algorithm based on the Nyquist frequency criterion and piecewise linear hodograph approximation is developed. This algorithm is used to investigate the parametric stability of the high-order generator model. A computational experiment was performed to evaluate the stability of the formers of probing signals with different types and orders of filters. The performed verification of the calculated boundary factors of the former by the Routh-Hurwitz criterion and the D-decomposition method confirmed the correctness of the results obtained.

Key words: Phase-metric method, geodynamic control, multi-polar electrical installations, multiplicative interference, the former of probing signals, parametric stability.

1 Introduction

The use of the multi-pole electrical installations makes it possible to carry out effective geodynamic monitoring of the environment under the technogenic and climatic influence at the territories of the industrial facilities with complex buildings (H. Thunehed; Et al. 2007, Sharapov R.V., Kuzichkin O.R. 2014). The method for isolating geodynamic variations of the medium consists in analyzing the space-time variations of the electric field vectors created by a multipolar source of probing signals with a fixed position of sources and measuring bases. Tracking the geodynamics of the object is carried out by controlling of the parameters of the probing signals while simultaneously recording the phase characteristics of the field and compensating for the current trend of geoelectrical signals at the observation points (Kuzichkin O., Sharapov R. 2013).

The phase-metric method of recording of the geoelectric data is used to track the geodynamics of near-surface inhomogeneities and provides increased sensitivity to changes in the object of investigation. Practical application of this method showed its high sensitivity to weak geodynamic changes in the media under investigation and to external destabilizing factors (Dorofeev N. V., Romanov R. V., Kuzichkin O. R. 2016). The increase in the sensitivity of measurements, the initial installation and the operational positioning of the electrical installation (control of the sources of probing signals) make it possible to achieve monitoring efficiency (Dorofeev N.V., Kuzichkin O. R. 2015). However, this leads to a decrease in noise immunity (the impact of multiplicative interference), as well as to the possible loss of feedback stability when following a geodynamic trend, which is caused by external factors (temperature, humidity, etc.) (Romanov R.V. Kuzichkin O.R. 2015). During the application of this method, the cases of hardware failures were recorded at the investigation of karst processes. This was caused by the displacement of the key measurement point in the bipolar geoelectric installation and led to data loss. During the analysis of the failures, it was found that the cause of the disturbance is the appearance of a sharp change in the hydrogeological regime in the control zone. This led to a loss of system stability when the trend component of the geoelectric field vector was compensated. It is necessary to ensure the stability of the former of the probing signal when controlling the parameters of the electrical installation in various modes of measurement. This will make it possible to achieve the reliability of the functioning of the phase-measurement systems of geodynamic control. In this case, the aim of the work is to develop of the method for modeling and analyzing the parametric stability of formers of the probing signals.

1.1 The generalized model of phase formation of the probing geoelectric signals in the geodynamic control systems

When multipolar electrical installations are used in the geodynamic monitoring systems, the total probing geoelectric field is formed by controlling the phases and amplitudes of the probing signals. The probing geoelectric signals of systems can be represented by single harmonic oscillations with certain amplitudes, frequencies and phases, or a set of such oscillations. Thus, for the analysis of multipolar installations, the application of the generalized model of amplitude-phase formation and signal transformation is relevant (Kurilov, I.A., Vasiliev G.S., Kharchuk S.M. 2010). The model will simplify the design of geodynamic control systems, as well as provide an opportunity to assess the extreme conditions of their operation.

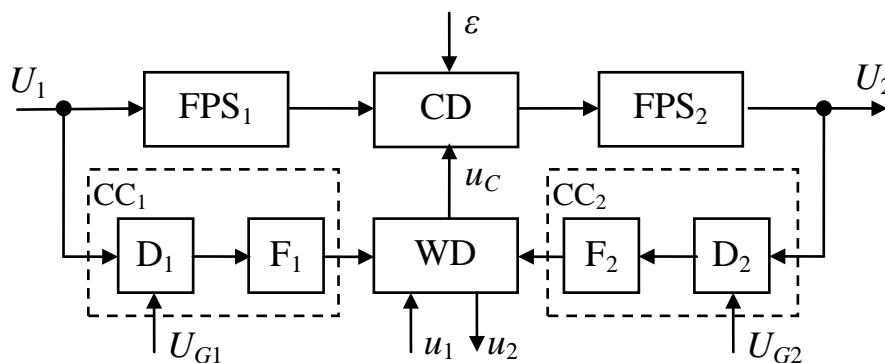


Figure 1: The generalized model of the amplitude-phase former of the probing signals. Designations: $U_{1,2}$ are the main input and output signals of the FZS, $U_{G1,2}$ are the signals of equivalent reference generators of detectors ($D_{1,2}$), F 's are the filters in the detection circuit, $u_{1,2}$ are the auxiliary input

and output signals, u_C is the control signal, \mathcal{E} is the destabilizing factor.

The generalized model of the former of the probing signal (FPS) presented in Figure 1 is identical to the model described in (Vasilyev G.S., Kurilov I.A., Kuzichkin O.R., Surzhik D.I., Kharchuk S.M. 2015). The model consists of two similar formers of probing signals FPS_{1,2}, control device (CD), control channels (CC_{1,2}) and a weight distributor (WD). The amplitude and (or) phase of the input signal of the former are controlled in the CD. The channels CC₁ and CC₂ consist of the detector for deviating the amplitude and / or phase of the signal, as well as the filter. The CC_{1,2} channels realize the principle of regulation by perturbation and deviation, respectively. The values of the transmission factors WD determine the proportions of the transmission of signals from its inputs to the outputs, on the basis of which the control and output auxiliary signals FPS are formed.

The different variants of the construction of the former - with regulation by disturbance (RD), deviation (RDev) and combined control (CC) can be obtained by selecting the values of the corresponding weight distributor coefficients. Further disclosure of FPS_{1,2} allows to represent devices of different types (direct, reverse, local, common, multi-loop) and its number of connections. Thus, the flexible structure of the generalized model makes it possible to investigate a wide class of circuitry of the formers of the signal of electro-locating devices that differ in the number of channels (poles), the dependence between the signal parameters in individual channels, the characteristics of the links, the magnitude of the disturbances and possible changes in the control object.

1.2 Analysis of the parametric stability of the former of the signal of electro-locating installations on the basis of the generalized model

The urgency of the problem of analyzing of the parametric stability is determined by the need to maintain the balance of the probing device for its successful operation with a variation in the parameters of the installation and the impact of small and large noise. For the study of parametric stability, it is proposed to use the combined approach based on the Nyquist frequency criterion, the D-partitioning over a set of parameters, and the piecewise linear hodograph approximation (Zaitsev, G.F. 1978).

The proposed method on the basis of the generalized FPS model with the use of approximation by continuous piecewise linear functions (Kuzichkin O.R., Bykov A.A., Kurilov I.A. 2015) makes it possible to analyze the parametric stability of high-order of the FPS in the wide range of circuit parameters and interference impact.

From the theory of automatic control, it is known that the including of a coupling according to the determining influence does not affect the stability of the device, i.e. in the combined systems, the stability conditions are determined only by the characteristic equation of the closed part (Gonorovsky, I.S. 1971). Equating to zero the denominator of the operator transfer coefficient-the characteristic polynomial the characteristic equation is obtained:

$$1 + N_2 M_2(p) = 0 \quad (1)$$

where N_2 is the coefficient of regulation of the chain,

$M_2(p)$ is the transmission coefficient F_2 , $p = d/dt$ is the Laplace operator.

The device is stable (Postnikov, M.M. 1981, Gryazina, E. N. 2008), if all the roots of equation (1) have a negative real part. If there is at least one imaginary root in the equation (1), the FPS is at the stability boundary, while the real parts of the other roots must be negative.

Thus, taking the ($p = j\omega$) in (1), the value of the coefficient

N_2 corresponding to the stability boundary will be determined by the formula:

$$N_2(\omega) = \operatorname{Re}[N_2(\omega)] + j \operatorname{Im}[N_2(\omega)] = -\frac{1}{M_2(j\omega)}. \quad (2)$$

The arbitrary value of the frequency corresponds to a complex value. Since the coefficient N_2 is the real number, the condition for the stability boundary of the former will take the form $\operatorname{Im}[N_2(\omega)] = 0$. According to (2), this condition is satisfied if:

$$\operatorname{Im}[M_2(j\omega_k)] = 0 \quad (3)$$

where ω_k are the critical frequencies (the root values corresponding to the stability boundary), k is the root number.

For the arbitrary configuration and order F_2 , its complex transfer coefficient can be conveniently represented in the form (Vasilyev G.S., Kurilov I.A., Kharchuk S.M. 2013)

$$M_2(j\omega) = \frac{\sum_{i=0}^I \alpha_i (j\omega)^i}{\sum_{i=0}^I \beta_i (j\omega)^i} \quad (4)$$

where I is the order of the filter, α_i, β_i are the filter coefficients.

The formula (4) in a general form for different filter coefficients in the feedback loop α_i, β_i must be transformed. To do this, in the numerator and denominator of the complex transfer function the real and imaginary parts must be transformed by the formulas:

$$A_{1i}(\omega) = \operatorname{Re}[A_i(j\omega)] = \alpha_{4i} \omega^{4i} - \beta_{4i+2} \omega^{4i+2}$$

$$B_{1i}(\omega) = \operatorname{Re}[B_i(j\omega)] = \beta_{4i} \omega^{4i} - \beta_{4i+2} \omega^{4i+2}$$

$$A_{2i}(\omega) = \operatorname{Im}[A_i(j\omega)] = \alpha_{4i+1} \omega^{4i+1} - \alpha_{4i+3} \omega^{4i+3} \quad (5)$$

$$B_{2i}(\omega) = \operatorname{Im}[B_i(j\omega)] = \beta_{4i+1} \omega^{4i+1} - \beta_{4i+3} \omega^{4i+3}.$$

Then (4) taking into account (5) takes the form

$$M_2(j\omega) = \frac{\sum_{i=0}^I [A_{1i}(\omega) + jA_{2i}(\omega)]}{\sum_{i=0}^I [B_{1i}(\omega) + jB_{2i}(\omega)]} = \frac{A_1(\omega) + jA_2(\omega)}{B_1(\omega) + jB_2(\omega)}. \quad (6)$$

After the conversion, the formulas will be received

$$\left(\sum_{i=0}^I \alpha_{4i+1} \omega_k^{4i+1} - \alpha_{4i+3} \omega_k^{4i+3} \right) \times \left(\sum_{i=0}^I \beta_{4i} \omega_k^{4i} - \beta_{4i+2} \omega_k^{4i+2} \right) - \left(\sum_{i=0}^I \alpha_{4i} \omega_k^{4i} - \beta_{4i+2} \omega_k^{4i+2} \right) \times \left(\sum_{i=0}^I \beta_{4i+1} \omega_k^{4i+1} - \beta_{4i+3} \omega_k^{4i+3} \right) = 0. \quad (7)$$

Here, the filter coefficients are defined by zeros: $\alpha_{i>I}, \beta_{i>I} = 0$.

The roots of the equation (7) correspond to the boundary values $N_2(\omega)$ in formula (5). To find the roots it is necessary to designate the left-hand side of equation (7) as the function of $f(\omega)$. The order of the polynomial $f(\omega)$ is equal to the order of the filter F_2 and is equal to I . The general solution of the polynomial of arbitrary order is absent. Next, it is necessary to approximate $f(\omega)$ on the basis of the continuous piecewise functions (CPF) (Kurilov I.A., Vasiliev G.S., Kharchuk S.M., Surzhik D.I. 2012). This allows determining the roots of the equation with any given accuracy for any order of F_2 . Defining of the approximation parameters: the range of the variable from ω_0 to ω_N , N is the maximum number of the approximation node, Δ_ω is the step of the variable change, and n is the current number of the approximation node. The CPF approximating the polynomial $f(\omega)$ in the interval $(\omega_0; \omega_N)$ takes the form:

$$f_\Sigma(\omega) = \sum_{n=0}^{N-1} f_n(\omega) Q_n(\omega) \tag{8}$$

where $f_n(\omega) = K_n \omega + L_n$ – is the straight line approximating of the $f(\omega)$ on the section $\omega_n \rightarrow \omega_{n+1}$, $K_n = [f(\omega_{n+1}) - f(\omega_n)] / \Delta_\omega$,

$L_n = f(\omega_n) - K_n \omega_n$ are the approximation coefficients,

$\Delta_\omega = (\omega_N - \omega_0) / N$ and

$$Q_n(\omega) = \frac{1}{2\Delta} \sum_{\lambda=0}^1 \sum_{\gamma=0}^1 (-1)^{\lambda+\gamma} |\omega - \omega_n - \gamma\Delta_\omega + \Delta(1-\lambda)|$$

are the CPF inclusive, forming of the approximate section of the line, Δ is the arbitrary small number, λ, γ – are the coefficients equal to “0” or “1”.

The roots (8) are defined as the intersection points of the approximating lines $f_n(\omega)$ with the abscissa axis, that is $f_n(\tilde{\omega}_{k_n}) = 0$:

$$\tilde{\omega}_{k_n} = -L_n / K_n. \tag{9}$$

As a result, getting N roots. To exclude “false” roots $\tilde{\omega}_{k_n}$, it suffices to multiply (9) by $Q_n(\tilde{\omega}_{k_n})$:

$$\omega_{k_n} = \tilde{\omega}_{k_n} Q_n(\tilde{\omega}_{k_n}). \tag{10}$$

The corresponding inclusion function from the “false” roots is zero. The boundary values N_{2k} for each true root are obtained by substituting the nonzero values (10) into (2)

$$N_{2k} = N_2(\omega_k) = -\frac{1}{M_2(j\omega_k)} \tag{11}$$

Taking (4) into account, obtaining:

$$N_{2k} = -\frac{1}{M_2(j\omega_k)} = -\frac{\sum_{i=0}^I \beta_i(j\omega_k)^i}{\sum_{i=0}^I \alpha_i(j\omega_k)^i} \tag{12}$$

In accordance with formula (12), the values are real. Omitting the imaginary component, the formula (12) takes the form:

$$N_{2k} = -\frac{\left(\sum_{i=0}^I \alpha_{4i} \omega_k^{4i} - \beta_{4i+2} \omega_k^{4i+2}\right) \times \left(\sum_{i=0}^I \beta_{4i+2} \omega_k^{4i+2} - \beta_{4i} \omega_k^{4i}\right)}{\left(\sum_{i=0}^I \alpha_{4i} \omega_k^{4i} - \beta_{4i+2} \omega_k^{4i+2}\right)^2 + \left(\sum_{i=0}^I \alpha_{4i+1} \omega_k^{4i+1} - \alpha_{4i+3} \omega_k^{4i+3}\right) \times \left(\sum_{i=0}^I \beta_{4i+3} \omega_k^{4i+3} - \beta_{4i+1} \omega_k^{4i+1}\right)} + \frac{\left(\sum_{i=0}^I \alpha_{4i+1} \omega_k^{4i+1} - \alpha_{4i+3} \omega_k^{4i+3}\right) \times \left(\sum_{i=0}^I \beta_{4i+3} \omega_k^{4i+3} - \beta_{4i+1} \omega_k^{4i+1}\right)}{\left(\sum_{i=0}^I \alpha_{4i+1} \omega_k^{4i+1} - \alpha_{4i+3} \omega_k^{4i+3}\right)^2} \tag{13}$$

The joint solution of the equations (7) and (13) allows obtaining the values of all the boundary coefficients of the former with arbitrary filters. To analyze the stability of a particular version of the FPS, it is necessary to perform the substitution of the filter coefficients $F_2(\alpha_i, \beta_i)$ in these formulas. The total number of the boundary coefficients is determined by the order of equation (7) and is equal to the order of the filter I .

The results of the computational experiment on the analysis of the stability of the FPS operation with the different types of the filters

As an example, we calculate the area of stable work of the former, when the F_2 filter is a 5th order low-pass filter with a transfer function (Popov, P.A. 1998)

$M_2(p) = 1/(1+Tp)^5$, where T is the filter time constant. The coefficients F_2 take the values:

$$\alpha_0=1, \alpha_{1+5}=0, \beta_0=1, \beta_1=5T, \beta_2=10T^2, \beta_3=10T^3, \beta_4=5T^4, \beta_5=T^5. \tag{14}$$

Substituting the values of the coefficients in the formulas (5) and (6), obtaining:

$$A_1(\omega)=1, A_2(\omega)=0, B_1(\omega)=5T^4\omega^4 - 10T^2\omega^2 - 1, B_2(\omega)=T^5\omega^5 - 10T^3\omega^3 + 5T\omega. \tag{15}$$

The polynomial of the left-hand side of equation (7) takes the form:

$$f(\omega) = -T^5\omega^5 + 10T^3\omega^3 - 5T\omega. \tag{16}$$

Taking the time constant $T=1c$ and approximating of the polynomial (8) in the range of variables $\omega_0 = 0c^{-1}$,

$\omega_N = 4c^{-1}$, $N=100$, $\Delta_\omega = 0,04c^{-1}$. From all $N=100$

roots (9) to define the true roots: $\omega_0 = -3,078c^{-1}$,

$\omega_1 = -0,727c^{-1}$, $\omega_2 = 0$, $\omega_3 = 0,727c^{-1}$,

$\omega_4 = 3,078c^{-1}$. The values N_{2k} corresponding to the

roots (13) are equal to $N_{20} = -354,885$,

$N_{21} = 2,885$, $N_{22} = -1$, $N_{23} = 2,885$,

$N_{24} = -354,885$. Defining the $N_2^H = -1$,

$N_2^G = 2,885$. Consequently, the stability region of the

former with the low-pass filter of fifth-order in the CC_2

represents the section $-1 \leq N_2 \leq 2,885$. The result

coincides with the D-decomposition method obtained in (Gryazin, E.N. 2004).

Analogously, carrying analyze of the stability of the FPS with filters of other types and orders. Let's calculate the area of stable operation of the converter with four types of filters in the RDev circuit: low-pass (LPF), high-frequency (HPF), bandpass (BF) and rejection (RF). LPF and HPF are of the order up to and including the 10th ($I = 1 \dots 10$), for BF and RF at $I = 2, 4, 6, 8, 10$. Each LPF and HPF consists of the same filters of the first order. The composition of the BF and RF includes the equal number of links of the low-pass filters and high-pass filters of the first order.

The transfer functions of the filters are:

$$M_2^{LPF}(p) = 1/(1+Tp)^I$$

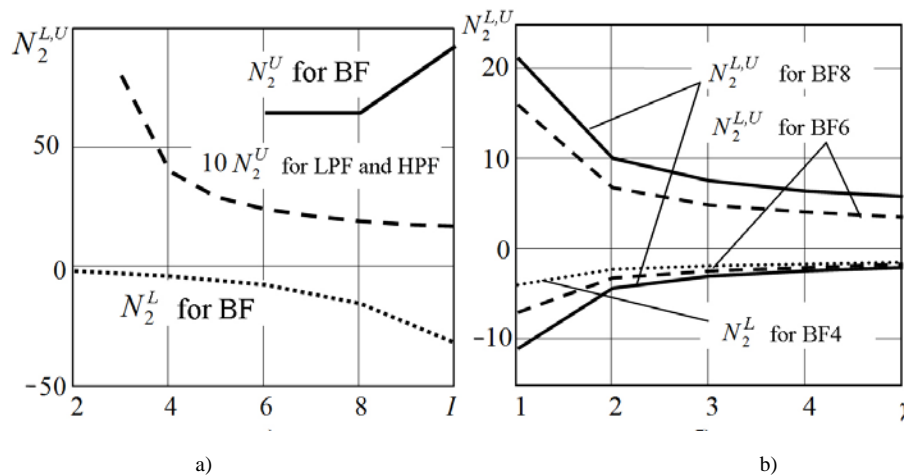


Figure 2: The boundary values of the stable transmission coefficients of feedback circuits for devices with different types of filters: a) the dependence on the order of the filter I ; b) the dependence on the parameter γ

The lower bound $N_2^{L,U} = -1$ for any order of the LPF and the HPF is not shown in the figure. For these types of the filters for $I=1$ and $I=2$, the upper limit values are not ($N_2^U \rightarrow \infty$), the FPS with LPF and with HPF is stable at values are $N_2 \geq -1$. As the order of F_2 increases, the stability area narrows from above (N_2^U is decreases).

The area of stability of the FPS with the BF for $\gamma = 1$ has a different character (Fig. 2a). For values of $I=1$ and $I=2$, the upper limit is absent ($N_2^U \rightarrow \infty$). With an increase in the order of the BF, the stability area expands both from above and from below.

The areas of stability of the FPS with the BF of different orders for the values of $\gamma=1 \div 5$ are shown in Fig. 2b. As can be seen from the figure, with increasing γ and any order of the BF, the stability area narrows both from above and from below. For the RF N_2^L weakly depends on the filter order for any γ , approximate value is $N_2^L \approx -1$, upper limit is $N_2^U \rightarrow \infty$ (not shown in the figure).

The Raus-Hurwitz test for the various fixed values $N_2 = N_{2k}^*$ was performed for each filter under study. The verification confirmed the stability of the converter in the main

$$M_2^{HPF}(p) = (Tp)^I / (1+Tp)^I$$

$$M_2^{H\phi}(p) = H_{LPF}(p)H_{HPF}(p) = (\gamma Tp)^{0.5I} / [(1+Tp)(1+\gamma Tp)]^{0.5I} \tag{17}$$

$$M_2^{RF}(p) = 1 - M_2^{BF}(p)$$

In the formulas 17, T is the time constant of the link in the LPF and HPF, γ is the ratio of the time constants of the HPH and LPF links in the composition of the BF and RF. The coefficients F_2 are determined from the formula of the transfer function for a particular type and order of the filter. The polynomial of the left-hand side of (7) is obtained with allowance for (5) for the found

values of the coefficients. The obtained dependences $N_2^{H,6}$ are shown in Fig. 2.

section $[N_2^L; N_2^U]$ and the instability in all others $[N_{2k}; N_{2k+1}]$.

2 Conclusion

The application of the generalized model of amplitude-phase formation and transformation of the signals is substantiated. This model will allow analyzing the stability of the blocks of adaptive forming of the signal in the geodynamic control systems based on multi-pole electrical installations.

Application of the model will simplify the design of geodynamic control systems, as well as provide an opportunity to assess the extreme conditions of their operation. The method for analyzing the stability of high-order formers with different types of control channel filters has been developed. The new approach is based on the use of the Nyquist frequency criterion and piecewise linear approximation of the hodograph of the transfer function of the former. The choice of the specific filter of the control path is carried out by simply substituting its coefficients in the obtained formulas of the generalized FPS model.

A computational experiment was performed to evaluate the stability of the formers of probing signals with different types and orders of filters: with filters of low frequencies, high frequencies, band and notch filters from 1 to 10 order. The performed verification of the calculated boundary factors of the former by the Routh-Hurwitz criterion and the D-decomposition method confirmed the correctness of the results obtained. In contrast to the Routh-Hurwitz criterion, in order to study the parametric stability of the FZS, the developed method does not require solving the system of inequalities. The construction of a hodograph or boundary curves is also not required.

Acknowledgment

This work was supported by a grant of the Ministry of Education and Science of the Russian Federation № 5.3606.2017/PCH.

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Primary Paper Section: B**Secondary Paper Section: BO**

G AGRICULTURE

GA	AGRICULTURAL ECONOMICS
GB	AGRICULTURAL MACHINES AND CONSTRUCTION
GC	PLANT GROWING, CROP ROTATION
GD	FERTILIZATION, IRRIGATION, SOIL TREATMENT
GE	PLANT CULTIVATION
GF	DISEASES, PESTS, WEEDS AND PLANT PROTECTION
GG	ZOOTECHNICS
GH	NUTRITION OF FARM ANIMALS
GI	FARM ANIMAL BREEDING AND FARM ANIMAL PEDIGREE
GJ	BDISEDAISES AND ANIMAL VERMIN, VETERINARY MEDICINE
GK	FORESTRY
GL	FISHERY
GM	FOOD INDUSTRY

EFFICIENCY ESTIMATION OF TYPE OF THE ELECTRICAL EXPOSURE ON PLANTS AT THEIR PROCESSING

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Abstract. In variety of technological operations in agriculture and the processing industry to intensify processes associated with plants and plant raw materials, there are used effects of electromagnetic nature. Electrical effects on plants can be organized to stimulate their growth and development, increase yields, in order to achieve lethal damage to accelerate maturation, weed control and in-line weeding of crops, and to process vegetable raw materials for drying fruits, berries, vegetables and melons, increasing their juice yield during processing, etc. The action itself can be performed by means of electric and magnetic fields, various types and stages of electrical discharges, dissimilar electric currents: constant, pulse, alternating sinusoidal, alternating non-sinusoidal, currents with and without electric spark discharge, etc. Therefore, both from energy and technological points of view, it is interesting to represent the detection of the most effective type of electrical exposure acting on the plant or raw material. Basing on the results of experimental research and studying electric processing of sunflower, tobacco and various weed plants, there was compared efficiency of different current types (sinusoidal and pulsed) used in processing. Theoretical comparison of energetically equal sinusoidal and pulsed currents at exposing on plant tissues to achieve lethal (irreversible) damage made it possible to state that the electric treatment of plant objects by discharge voltage pulses is more effective than the action of energy equal to the sinusoidal voltage, while impulse action on plant tissue is more effective, than the impact of sinusoidal voltage in 1.7 times. The experimental verification completely confirmed the theoretical conclusions that the pulsed electric current, the depth of damage (damage degree) of tissues of different plants (tobacco, sunflower, weed plants) from which is more effective than the sinusoidal current for obtaining lethal, irreversible damage to plant objects in 1.3-3.4 times.

Key words: electric current, energy, impulse current, sinusoidal current, half of period, energetically equivalent values, damage degree, lethal (irreversible) damage.

1 Introduction

The electrical effect on plants can be carried out with the purpose of stimulating their growth, development, increasing yield and with the purpose of achieving lethal damage to accelerate the ripening sunflower and tobacco plants, drying fruit and vegetable crops, increasing the yield of fruit, berries, vegetables, etc., including hard-to-root and quarantine ones, etc. (Armyanov, N. 1999; Baev, V.I. 2002; Diprose, M.F. 1980; Kaufman, K.R. 1980; Недялков, H. 1996; Reed J. 2009; Stankovic, M. 2016; Stankovic, M. 2012; Vigneault, C. 2001; Rodrigues, S., Fernandes, F.A.N. 2012; Jeyamkondan, S. 1999; Barsotti, L. 1999; Judajev, I.V. 2008; Yudaev, I.V. 2004; Yudaev, I.V. 2012). To achieve the technological effect of such processing, it is necessary to know the optimal parameters of the electric exposure: the amplitude value of the voltage, the repetition rate of the pulses or the acting current, the value of the electric or magnetic field strength in the plant tissue, the amount of energy absorbed by the tissue, and so on. But the initial research task

is to determine the kind of impact that allows to achieve the set purpose of the electrical processing of plants or raw materials. The effect can be carried out by electric, electromagnetic and magnetic fields, various types and stages of electrical discharges, dissimilar electric currents: constant, pulsed, variable sinusoidal and variable non-sinusoidal, using an electric spark discharge and without it, etc. If to focus on impulse discharges and sinusoidal currents, as the most simply technically feasible electrotechnologies, then it is very important from the energy and technological point of view to identify the most effective of these impacts, which is the purpose of the research of the presented article. Let's consider the solution to this problem using the example of an electrical treatment to obtain a lethal tissue damage of sunflower and tobacco plants in order to increase ripening and drying of achenes, leaves and weeds to destroy them.

2 Methodology

Since the interaction of any damaging factor with a vegetable object, is energetic one, the amount of energy produced in a plant tissue is accepted as the criterion for the assessment of current type effectiveness (Baev, V.I. 2002; Yudaev, I.V. 2004; Yudaev, I.V. 2012). All variants of the impact by different types of current must be equal by energy. This means that the same patterns of plant stems should be fed with the same amount of energy by different sorts of currents and at that the energies released in tissues shall be compared: the efficiency of current type depends on the amount of energy.

In order to perform a comparison let's use a known equivalent electrical circuit of substitution and the conductive properties and parameters of a plant tissue (Baev, V.I. 2002; Cole, K.S. 1949; Zhang, M.I.N. 1990; Yudaev, I.V. 2012; Yudaev, I.V. 2004; Yudaev, I.V. 2012).

Due to the presence of plant tissue substitution of an electrical capacity and because of the possible polarization of the working electrodes constant current will be less effective than the AC and pulse currents, particularly at the beginning of processing, when the capacitive properties of the cell membranes are not broken yet. Therefore we compare further only two kinds of currents: pulse and alternating one. Alternating non-sinusoidal current because of the similarity with the sinusoidal one, the variety of possible options and the relative complexity of their production is not considered.

The voltage pulse was taken as a calculated one, which may be obtained on a pilot device, and which may be used then for the experimental verification of theoretical conclusions.

The comparison is conducted according to two basic options: 1) voltage pulse and sinusoidal voltage equivalent to it during a half of a period equal to the pulse duration (Fig. 1); 2) sinusoidal voltage during half a period with the frequencies of 50 and 400 Hz, and its equivalents in the amount of several voltage pulses (Fig. 2).

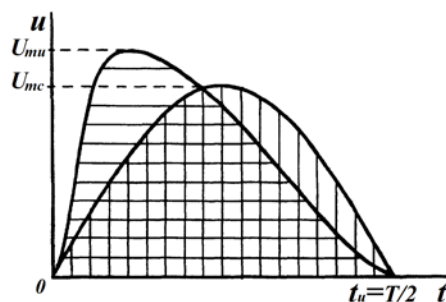


Figure 1: Equivalent voltage pulse and sinusoidal varying voltage during half a period equal to the pulse duration

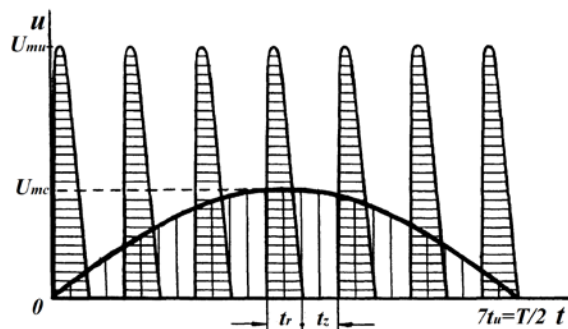


Figure 2: The half-sinusoidal voltage and its equivalent total voltage pulses

The equality of actual voltage values of these current types is taken for the criterion of energy equal voltage impulse and sinusoidal voltage is taken for half a period. Thus, for the comparison of the first option (Fig. 1) the operating values at the same duration of $4,5 \cdot 10^{-6}$ s will be the following ones

$$U_u = \sqrt{\frac{\sum_{i=1}^k u_i^2 \cdot \Delta t_i}{t_u}}; \quad U_c = \frac{U_{m_c}}{\sqrt{2}}. \quad (1)$$

where U_u ; U_c – acting value of voltages of impulse and sinusoidal currents, kV; U_{m_c} – amplitude value of sinusoidal voltage, kV; t_u – pulse duration, s.

Based on their equality, the peak value of sinusoidal voltage may be calculated according to the following formula

$$U_{m_c} = \sqrt{2 \frac{\sum_{i=1}^k u_i^2 \cdot \Delta t_i}{t_u}} = 2 \sqrt{\frac{\sum_{i=1}^k u_i^2 \cdot \Delta t_i}{T}}. \quad (2)$$

where T – period of sinusoidal current, s.

The energies absorbed by plant tissue will be determined by the expressions for the impulse excitation

$$W_u = \frac{\sum_{i=1}^k u_i^2 \cdot \Delta t}{R_u} \quad (3)$$

and for the impact by sinusoidal voltage during half a period

$$W_c = \frac{1}{R_c} \int_0^{T/2} U_{m_c}^2 \cdot \sin^2 \omega t \cdot dt = \frac{U_{m_c}^2 \cdot T}{4R_c}. \quad (4)$$

where W_u ; W_c – amount of absorbed energy for pulsed and sinusoidal actions, J; R_u ; R_c – equivalent resistance of the tissue during the action, respectively, of the voltage pulse and sinusoidal voltage, Ohm; ω – angular frequency of the current, rad / s.

The resistances R_u and R_c are the equivalent resistances of the fabric during the operation time, respectively, the voltage pulse and sinusoidal voltage. The value R_u is calculated according to the experimental oscillograms of current and voltage on the fabrics (Baev, V.I. 2002) and is equal to 190 ohms. From the oscillograms (2) we find that $U_{m_c} = 7,81$ kW.

According to the experimental current-voltage characteristic of sunflower plant tissue (2), for the average diameter of a sunflower stem in the 15 mm place of processing, we find the equivalent resistance of the stem $R_c = 280$ Ohms.

The calculations according to (3) and (4) provide the values of $W_u = 0,8$ J and $W_c = 0,47$ J. These values indicate that the impulse effect on the plant tissue is 1,7 times more effective than the impact by sinusoidal voltage.

The practical interest is presented by the comparison of these currents initial impact on living plant tissue the capacitive properties of its cell membranes are not violated. In this case, the tissue resistance may be determined as the input impedance of its equivalent substitution circuit.

And using the same expressions (3) and (4) we obtain $W_u = 0,02$ J and $W_c = 0,0177$ J, i.e. and at the beginning of processing the pulse impact is more efficient than sinusoidal one by 13%.

For the second variant of comparison (Fig. 2) let's take the duration of exposure on the tissue equal to half period of the sinusoidal voltage at some low standard frequency f , such as 50 Hz or 400 Hz. Such frequencies should be considered because of the relative ease of the method practical implementation using standard power equipment as small power generators and transformers with such frequencies frequency are produced by industry.

During the half of the received frequency period the impact m will be provided for the tissue as in the first variant of pulses

$$m = \frac{T/2}{t_{zap} + t_{paz}}. \quad (5)$$

where t_z ; t_r – time of charge and discharge of capacitors in the discharge circuit of the generator of impulse voltages, s.

For these pulses the actual voltage will be the following one

$$U_u = \sqrt{\frac{\sum_{i=1}^k u_i^2 \cdot \Delta t_i}{t_{zap} + t_{paz}}}. \quad (6)$$

For the equivalent sinusoid (Fig. 2) the current value should be the same, and its amplitude will be the following one

$$U_{m_c} = \sqrt{2} U_u = \sqrt{\frac{2 \sum_{i=1}^k u_i^2 \cdot \Delta t_i}{t_{zap} + t_{paz}}}. \quad (7)$$

Based on the capacity of the discharge circuit experimental values and the energy of a single pulse, the duration of the discharge, the spark channel deionization rate, the duration of the charge capacitors the highest frequency of discharges in the circuit will be the following one $5,6 \cdot 10^3$ Hz and $T_u = t_{zap} + t_{pas} = 180 \cdot 10^{-6}$ s.

At the standard frequency of compared sinusoid $f = 50$ Hz during the half the number of chargers will make $m = 55 \dots 56$ according to (5). The amplitude of the sinusoidal voltage will be 1310 V according to (6) and (7). The average tension on a plant stem will

be the following one:
$$E = \frac{U_{mc}}{d_{cm\Box}} = \frac{1310}{15} \approx 87 \text{ W/mm.}$$

By the extrapolation of current-voltage characteristics of plant tissue (2) volt-ampere characteristic according to obtained tension we will obtain the current $i \approx 81 \cdot 10^{-3}$ A. And then we get the resistance $R_c = 1074$ ohms equivalent to a discharge.

The energy released in tissues from the sinusoidal voltage during 0.01 s will be 7.87 J according to (4). The total energy of 55 pulses for the same period will make 44.4 J, i.e. 5.6 times more.

If we compare the effects by a pulsed voltage and a sinusoidal voltage with the frequency of 400 Hz, we get the following values: of $T_c/2 = 0.00125$ s; $m = 7$ discharges; $7W_u = 5.6$ J; $W_c = 0.98$ J. I.e. during the impact by the sinusoidal voltage of 400 Hz 5.7 times less energy is released in the plant tissue is released than at the plant tissue processing by pulse voltage.

It should be noted that in fact the greatest value of released energy W_u and W_c ratio will be less than the calculated one as the average resistances are accepted as equivalent resistances of an object to simplify the calculations. In fact, the resistance is the function of the energy released in the tissues. Furthermore, the change in the amplitude of the sinusoidal voltage will likely lead to the changes in the intensity of damaging plant tissue factor that is not taken into account in the abovementioned considerations.

Thus, the abovementioned theoretical analysis shows that the electrical processing of plant objects by discharge voltage pulses is more effective than the impact by sinusoidal voltage of equal energy.

Experimental verification of this conclusion was carried out by comparing the degrees of same sunflower stem damage from the effects of sinusoidal voltage with the amplitude of 1310 V during half of the period at the frequency of 50 Hz and 55 voltage pulses at the amplitude of 9.16 kV and the duration of $4,5 \cdot 10^{-6}$ s. This technique is based on experimentally tested assumption that the extent of the plant tissue damage is proportional to the amount of absorbed energy.

The degree of plant tissue damage S_n refers to the quantity the numerical value of which is equal to the ratio of tissue impedance active component after the electric treatment resistance at a fixed frequency of the measuring current, in this case at the frequency of $f = 10$ kHz, which does not lead to the occurrence of near-electrode polarization phenomena that affect the quality of measurements (Baev, V.I. 2002; Yudaev, I.V. 2004; Yudaev, I.V. 2012).

The plant stem was fixed between the electrodes at the direct contact with them. Half of the sinusoidal voltage period is applied to the stem using a specially designed circuit in which the role of the key, closing the circuit with a plant object was performed by a controlled ball spark gap (Baev, V.I. 2002). The duration of the discharge in this interval was 0.01 s.

The treatments of stems with discharge pulses of voltage were performed from a high voltage pulse generator (VPG) with adjustable amplitude and pulse energy. The technique of conducting research was described in (Baev, V.I. 2002; Yudaev, I.V. 2004; Yudaev, I.V. 2012), where the method of plant tissue damage degree measuring is described.

The results of the experiments and their processed data are summarized in Table 1 (as an example) and are presented at Figure 3.

Table 1 Experimental effectiveness of current types

Current type	Impact period	Voltage amplitude, kW	Active voltage, kW	Repeatability	Damage degree, g.u.	Damage degree relation
Pulse	55 imp. according to $4,5 \cdot 10^{-6}$ s	9,16	0,928	6	$S_{m1}=1,5$	$\frac{S_{m1}}{S_{nc}} = 1,3$
Sinusoidal, $f=50$ Hz	0,01 s	1,308	0,928	6	$S_{nc}=1,15$	

Table 1 demonstrates the main parameters of single energy equal effects on tobacco stalks in the transverse direction and at sinusoidal and pulse voltages.

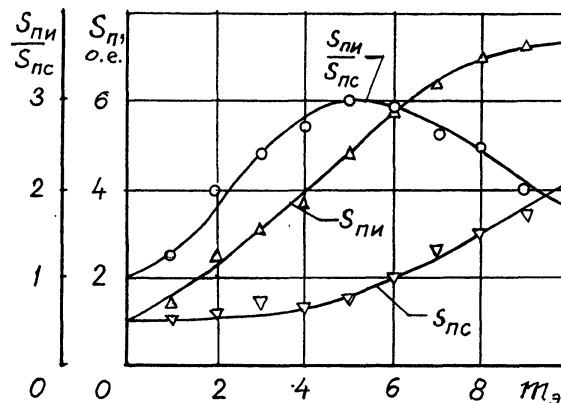


Figure 3: The dependences of plant tissue damage degrees at the exposure to pulsed and sinusoidal voltages and their relation from the number m of single energy equal effects

Fig. 3 shows the dependences of pulsed and sinusoidal elements at the current frequency of 50 Hz from the number $m\alpha$ of individual energy equal effects on the same plants.

Since the processing energies of plants are proportional to the number of effects, the both dependencies on the extent of tissue damage S_{mi} and S_{nc} on the number $m\alpha$, have S-shaped form. However, for a sinusoidal form of the active voltage the affecting degree of damage S_{nc} is significantly shifted to a larger number area (about two times) of single exposures. Approximately the same number of influences after S_{nc} will reach its maximum value in comparison with S_{mi} (outside the right part of the figure). Therefore, it is evident that the ratio of the damage degree S_{mi} to S_{nc} at the beginning and at the end of processing is numerically equal to one, and in the middle part of dependence on $m\alpha$ it has a pronounced maximum: when damage is not present, then $S_{mi} = S_{nc} = 1$ and at the end of limit processing for both types of current the damages have the same maximum degree, and their ratio is equal to one.

The biggest difference between the degrees of damage S_{mi} and S_{nc} and the greatest value of their relationship depend on the physiological development and the state of plant stems, on their geometric dimensions, etc. That is, all numerical values in all three dependences will vary from plant to plant, but their characters will be the same with fig. 3.

The presented material shows that the electrical processing of sunflower and tobacco plants, in order to achieve their lethal damage by discharge voltage pulses is more efficient than the processing by varying sinusoidal current, it enables to use the potential of power supply better.

Similar studies were carried out for weeds (Yudaev, I.V. 2004; Yudaev, I.V. 2012). Separate fragments of city Mari weeds (*Chenopodium urbicum* L.) and thrown back amaranth (*Amaranthus retroflexus* L.) were taken as the objects of processing.

At the determination of damage degree numerical values of cultivated weed tissues the stipulation was also set that the amount of energy delivered to the tissue in comparable cases should be the same, or very close by value. In order to conduct the experiments the scheme was developed that allows to cut one, two and four periods of the sinusoidal current voltage of industrial frequency and supply it to the input of a step-up

transformer, providing the impact on the studied plant tissue. VPG was used with the regulated parameters of a discharge contour in order to perform the pulse processing of plants (Baev, V.I. 2002; Yudaev, I.V. 2004; Yudaev, I.V. 2012).

The amount of absorbed energy by the tissue under study was evaluated by the following expressions:

- for sinusoidal impact:

$$W_c = \int_0^t u(t) \cdot i(t) dt = \int_0^t U_{mc} \cdot I_{mc} \cdot \sin^2 \omega t \cdot dt \quad (8)$$

where U_{mc} , I_{mc} is the peak value of sinusoidal form voltage and current, kV and A; t - time during which the absorption of energy is considered, c; ω - current angular frequency, rad/s.

- for high voltage pulse impact:

$$W_{umh} = 0,5 \cdot k_p \cdot m \cdot C_k \cdot U_0^2 \quad (9)$$

where k_p is the degree of discharge capacity (by voltage), taken at 0.9...0.95; U_0 - initial voltage of discharge circuit applied to the area of plant tissue with the length l_{pm} and the diameter d_{pm} , kV; C_k - discharge contour capacity, F.

The experimental studies performed in vitro with the fragments of weed stems allowed to obtain the following results (see Table 2).

Table 2 Comparative indicators of weed stem tissue damage at sinusoidal and pulsed high-voltage exposure

Weed type	High voltage ($U_{max} = 2$ kV) sinusoidal impact of:			High voltage impulse impact ($U_0 = 2$ kV) with the pulse number m , at $C_k = 1000$ pF:		
	One period $t=0,02$ c	Two periods $t=0,04$ c	Four periods $t=0,08$ c	$m=200$	$m=400$	$m=800$
Thrown back amaranth (<i>Amaranthus retroflexus</i> L.)	Affecting energy, J:			Affecting energy, J:		
	0,485	0,970	1,865	0,380	0,760	1,520
	Plant tissue damage level $S_{\text{пу}}$, r.u.			Plant tissue damage level $S_{\text{пк}}$, r.u.		
	1,47	2,03	2,46	3,72	4,13	4,75
City pigweed (<i>Chenopodium urticum</i> L.)	Affecting energy, J:			Affecting energy, J:		
	0,394	0,857	1,701	0,380	0,760	1,520
	Plant tissue damage level $S_{\text{пу}}$, r.u.			Plant tissue damage level $S_{\text{пк}}$, r.u.		
	1,43	1,80	2,29	4,10	6,10	6,90

The table shows that an electric pulse treatment of weeds is more effective technologically than the treatment with high-sinusoidal voltage. Therefore, it is necessary to develop appropriate pulse schematic solutions for the technical implementation of electric weeding.

3 Conclusion

The electrical treatment of sunflower, tobacco and weeds in order to achieve technologically necessary lethal damage demands the use of the most effective electric current type. This statement is developed on the basis of the theoretical premises and experimental study data to assess the extent of different plant tissue damage treated with the energy equivalent sinusoidal and pulsed currents.

Thus, an experimental comparison of the damage level of tobacco plant tissue when samples are subjected to discharge voltage pulses and sinusoidal current at frequency of 50 Hz, provided at the equal value of the acting voltage, shows that in the first case the damage level is 1.3 times greater than at treatment by sinusoidal current. These results confirm the theoretical justification of the technological efficiency of pulsed processing of tobacco plants before drying and sunflower plants before harvesting.

The analysis of experimental data allows to say that the effects of discharge voltage pulses for lethal damage of plant weed tissues are more effective than those ones of an energetically equal sinusoidal voltage. At the same time, the damage level during treatment by voltage impulses is even greater than at processing sunflower and tobacco plants, and in respect of sinusoidal influence it is more by 1.6-3.4 times.

4 Summary

Thus, the presented materials of theoretical estimate and the experimental study results suggest the possibility of an influencing factor use - a pulse mode of electrical processing of plants and plant raw materials in the processes of crop production and the processing of raw materials from it with the best technological performances and minimal energy consumption.

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Primary Paper Section: G

Secondary Paper Section: EF, GE, GC

THE INNOVATION TECHNOLOGY OF HIGH-LEVEL PROCESSING OF LEGUMINOUS RAW MATERIALS UNDER THE CONDITIONS OF IMPORTS PHASE-OUT

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Abstract: Now the perspective direction of the food industry is processing of chick-pea and use of products of processing of chick-pea (flour, proteinaceous isolate) in compounds of various food systems. Development of scientific and technological bases of complex, deep processing of chick-pea is directed to decrease in deficiency of protein and other valuable substances in a population food allowance, expansion of a range of products of healthy food, on active replacement of import grain products and development of capacity of domestic agro-industrial complex. Data of chemical composition for chick-pea of domestic grades «Krasnokutsky 28» are provided and «Privo-1», amino-acid it is fast proteins, Trypsinum - the inhibiting activity. By results of definition of chemical composition of beans of chick-pea of the specified grades it is established that the prevailing fractions are starchy and proteinaceous. It is also established that seeds of chick-pea of the studied grades are characterized by low level of activity of inhibitors of Trypsinum: Trypsinum - the inhibiting activity is 2,33 and 5,56 mg/g for grade chick-pea «Krasnokutsky 28» and «Privo-1» respectively. In envelopes of seeds of chick-pea the least activity of inhibitors of Trypsinum of 0,68 mg/g is found. The obtained data of fractional composition of proteins allowed to recommend proteinaceous products of processing of chick-pea for application in technology of food with the under content of gluten. Results of researches on expansion of a range of products of a healthy delivery on the basis of products of processing of chick-pea are presented: flour and sugary confectionery, vegetable canned food and sauces, mayonnaise sauces are offered. Chemical composition of afterproducts of processing of chick-pea is defined: envelopes of by-product of technology of traveling flour, rest meal after selection of proteinaceous isolate. The perspective directions of their application are designated.

Keywords: chick-pea, chickpeas flour, isolate of chickpeas protein, products of a healthy delivery, processing afterproducts.

1 Introduction

The leading role in the modern structure of world resources of food protein is occupied by vegetable raw materials. Traditional sources for production of proteinaceous products are soy and wheat. The factor limiting application of proteinaceous products from wheat is presence of allergenic potential of wheat protein – recently physicians note prevalence of a Gee's disease. Among bean, processed in the commercial scale, the forefront is come by soy, however products of deep processing (concentrates, isolates) come to Russia on import.

Now development of technology of complex processing of chick-pea with receiving new types of products of a healthy delivery and also additives of high nutrition value with the increased protein content is perspective that promotes replacement of import grain products and development of capacity of domestic agro-industrial complex.

Therefore as the priority direction of investment activities of agro-industrial complex of Russia the direction of deep processing of high-protein crops is allocated. One of the chief representatives bean, grown up in the territory of Russia, is leguminous culture chick-pea. Thanks to good productivity, high drought resistance, resistance to defeat by the majority of causative agents of diseases and wreckers interest in this culture from agricultural producers of area increases. Its value also consists in improvement of fertility of the soil due to enrichment by its nitrogen therefore chick-pea is an excellent predecessor of grain crops. For example, according to data of the Ministry of Agriculture of the Saratov region from 2009 for 2013 the size of acreage under chick-pea increased from 63,9 thousand to 216,5 thousand hectares, and harvest volume – from 17,4 to 153,9 thousand tons. Seed of chick-pea surpasses many traditional grain crops in protein content (to 32% for page of century depending on a grade), irreplaceable amino acids, vitamins, macro - and minerals (Skurihin, I.M. 1987, Mosolov, V.V. 1971).

2 Work purpose

Development of technology of complex processing of chick-pea with receiving new types of products of a healthy delivery and also additives of high nutrition value with the increased protein content is represented relevant.

3 Research course

As object of a research served seeds of food chick-pea the most extended for the last few years among agricultural producers of the Saratov region of grades «Krasnokutsky 28» and «Privo-1».

The quantitative amino-acid analysis of proteins of chick-pea was made on a liquid chromatography of the L-8800 model (Hitachi, Japan). Fractional composition of proteins from chick-pea seeds on solubility was determined by Osborne's method; activity of inhibitors of Trypsinum in chick-pea with use of a caseinolytic method. The Zhirmokislotty structure of the fatty phase allocated from chick-pea was analyzed in accordance with GOST 31663 (GOST P 52173-2003 Raw materials and foodstuff. A method of identification of the genetically the modified sources ,2005) on a gas chromatograph «Crystal 2000M», a column capillary HP FFAP (USA) by 50 m*0,32 mm*0,52 mkm.

Additional benefit of chick-pea is that this culture was not exposed to gene manipulations. The method of polymerase chain reaction executed in accordance with GOST P 52173 (Krilova, V.B. 1998) confirmed lack of recombinant DNA in beans of chick-pea of the studied grades.

By results of definition of chemical composition of beans of chick-pea of the specified grades it is established that the prevailing fractions are starchy and proteinaceous (table 1).

Table 1 Chemical composition of chick-pea of the studied grades (in %)

Index	«Krasnokutsky 28»	«Privo-1»
Mass fraction of moisture	9,0±0,5	8,5±0,5
Mass fraction of protein on a dry basis	24,0±0,2	20,7±0,2
Mass fraction of fat	3,7 ±0,3	4,3±0,3
Mass fraction of ashes	3,30 ±0,03	3,15±0,03
Mass fraction amyllum on a dry basis	46,0±1,3	41,8±1,3
Mass fraction of a fat	3,6 ±1,1	3,9±1,1

On the basis of a research of their physical and chemical characteristics it is established that higher content of protein (24%) and separate amino acids and smaller tripsinibiruyushchy activity (2,33 mg/g) is characteristic of grade chick-pea «Krasnokutsky 28». In this regard, for production of proteinaceous products (flour, isolate) it is preferable to use grade chick-pea «Krasnokutsky 28».

Calculation of amino-acid it is fast demonstrates that the limiting amino acids for chick-pea of a grade of «Privo-1» are methionine and cystine (30,9%), valine (80%), isoleucine (84,8%), threonine (93,5%); for grade chick-pea «Krasnokutsky 28» – methionine and cystine (39,1%).

Fractional composition of proteins from chick-pea seeds on solubility: the cooperative maintenance of albuminous and globulinovy proteinaceous fractions makes 96,6 – 98,0%, the maintenance of prolamines – 0,29–1,34%, glutelins – 1,63–2,01%. The analysis of fractional composition of proteins of chick-pea of grades «Krasnokutsky 28» and «Privo-1» allowed to recommend proteinaceous products of processing of chick-pea for application in technology of food with the under content of gluten.

It is known that seeds of family bean contain anti-nutrients – inhibitors of proteases and a lektina. Anti-alimentary substances make the negative impact on an organism, reducing digestion of some nutrients if not to destroy them by the corresponding processing. From all range of anti-alimentary factors inhibitors of proteinases because of their wide spread occurrence and high content in the reserving parts of plants seeds are of the greatest interest. Inhibitors of proteinases have property to significantly reduce catalytic activity of proteolytic enzymes (Trypsinum and chymotrypsin) of digestive tract of alive organisms, forming with them inactive complexes. Among plants the highest activity of inkhibitor of Trypsinum is found in seeds of bean cultures. According to various references, the activity of inhibitors of Trypsinum in seeds bean depending on high-quality features and conditions of cultivation is: for ranks – 8,8 mg/g, peanut – 0,4–6,2 mg/g, haricots – 0,5–4,6 mg/g, peas – 0,2–4,5 mg/g, soy – from 6,9 to 38,6 (Petibskaya, V.S.2012; Pashenko, L.P. 2006), 45 (Rudik, F.Ia.2012) and 21,1–61,3 mg/g (TR TS 021/2011 2012).

For the purpose of perfecting of technology of deep processing of chick-pea the possibility of application of electrochemical methods by combination of methods of electroflotation and an electrocoagulation is considered. The fizikokhimichesky processes taking place in the elektrofloktoagulyatsionny camera include the electrolytic oscillation of gas bubbles, adhesion of gas bubbles on protein particles with the adsorbed layer of ions, transportation of the formed units «vial of gas-a ionization proteinaceous particle» on the surface of solution, coagulation of such proteinaceous units and their loss in a deposit. Larger advantage of methods elektroflokto-and electrocoagulations is low concentration of electrolyte of the hum noise entered into solution for ensuring necessary conductivity, and selection of a particular design of a cell (electrolytic bath) and particular arrangement of electrodes allows to provide collateral course of processes of electroflotation and an electrocoagulation and to provide higher percent of extraction of protein.

When developing technology solutions of extraction of proteinaceous isolate with application of a method of an elektrofloktoagulyation a rational process conditions is defined:

- structure and concentration of electrolyte (0,1% solution of sodium hydroxide);
- an elektrofloktoagulyator design (a cell (electrolytic bath) of an express three-electrode design with strictly given vertical arrangement of three electrodes: two cathodes and one anode, it is strict on the center between cathodes);
- material of electrodes (in installation the electrodes from a graphite foil of GF-100 in the form of plates 0,8 mm thick placed in a separator from the polypropylene fabric are

used);

- a current density (with increase in protein content in solution from 7 ± 1 mg/ml to 15 ± 1 mg/ml the current density providing the maximal exit makes 60–65 and 100–105 A/m², respectively);
- process duration (30 minutes).

It is established that change of temperature of electrolyte in range from 20 to 50 °C does not exert the considerable impact on a protein exit. It can be explained with minor change of an electrical conductivity of the environment in the studied interval of temperatures.

Comparison of effectiveness of the combined elektrofloktoagulyatsionny method of extraction of chickpeas protein with traditional (chemical) demonstrates that on a protein exit (80–85%) the method of an elektrofloktoagulyation does not concede to a classical method, and favourably differs in the fact that allows to exclude from a production cycle a number of stages and use of chemical reagent for achievement of an isoelectric condition of protein.

When determining activity of inhibitors of Trypsinum in chick-pea it is established that seeds of chick-pea of the studied grades are characterized by low level of activity of inhibitors of Trypsinum: Trypsinum - the inhibiting activity is respectively 2,33 and 5,56 mg/g for chick-pea of grades «Krasnokutsky 28» and «Privo-1». In envelopes of seeds of chick-pea the least activity of inhibitors of Trypsinum – 0,68 mg/g is found. Now the given indicator is normalized only for soy proteinaceous products. According to Technical regulations (Vegetable protein / 1991) the maintenance of an inhibitor of Trypsinum in them should not exceed 0,5%. The obtained data for chick-pea (0,23–0,56%) demonstrate that the inactivation or a destruction of inhibitors of Trypsinum when processing chick-pea is not required. This circumstance it is possible to carry to advantages of culture chick-pea in comparison with soy as from all known processing methods of an inactivation of anti-nutrients influence of high temperatures is most widespread. At the same time not only anti-nutritious, but also useful components of seeds collapse (including sulfur-containing amino acids) and their biological value decreases.

It is also necessary to note that proteins of chick-pea favourably differ from proteins of others bean, for example, haricots, peas, in the level of maintenance of lektin. Lektina represent the glycoproteins capable to reversibly connect the connections containing the carbohydrate fragments located on a surface of membranes of cages; they cause aggregation or agglutination. The maintenance of lektin varies at different types of plants and makes for haricot 3200–6400, for lentil – 400–800, peas – 100–400, chick-pea 25–100 the gemagglyutininyokh of piece/mg (Kazanceva, I.L. 2012).

Carotinum is the main provitamin of vitamin A which, in turn, is necessary for prevention of infectious, skin and oncological diseases. Especially important advantage of chick-pea is selenium availability – 28,5 mkg in 100 g. A selenium is one of the key minerals providing normal function of enzymatic antioxidatic system of an organism β-Carotinum (0,09 mg/kg); β-Carotinum is the main provitamin of vitamin A which, in turn, is necessary for prevention of infectious, skin and oncological diseases. Especially important advantage of chick-pea is selenium availability – 28,5 mkg in 100 g. A selenium is one of the key minerals providing normal function of enzymatic antioxidatic system of an organism.

The analysis of the experimental datas of lipide structure confirms the high content of unsaturated fatty acids (about 87%) that is an indicator of high physiological value, at the same time the linoleic acid prevails (51,7–56,9 %).

The specified advantages of culture chick-pea define prospects of development of scientific and practical bases of its complex, deep processing directed to decrease in deficiency of protein and other valuable substances in a population food allowance,

expansion of a range of products of a healthy delivery on the fissile replacement of import grain products and development of capacity of domestic agro-industrial complex. And creations of the combined products for decrease in deficiency of protein in a delivery has the prospect of practical application in various food systems as a product of simple processing of chick-pea (chickpeas flour), and deep (isolates and concentrates). The main directions of use of chickpeas flour in compoundings of food systems – as gel-forming additive, a moisture-holding component, for increase in protein content in a compounding of flour and sugary confectionery, sauces and mayonnaise, vegetable canned food (Tyrsin, Yu.A. 2015). The isolate of chickpeas protein possessing high functional rates can be recommended for use as emulsifier and also for increase water- and zhirouderzhivayushchy ability of food systems (Tyrsin, Yu.A. 2012; Tyrsin, Yu.A. 2014, Turchaninov, D.V. 2015).

Results of the developed technology solutions are given in table 2 by production of new types of food products on the basis of products of processing of chick-pea – flour and sugary confectionery, vegetable canned food and sauces, both for broad consumer demand, and for specialized groups of the population (with the under content of gluten). At generalization of results (tab. 2) it is possible to draw a conclusion that introduction of

products of processing of chick-pea to compoundings of the specified food systems we allow to increase protein content and mineral substances in a finished stock and also biological value. On protein content in a disposable portion of a product from the recommended standard daily rate of consumption these products cannot be referred to category enriched, however in general the developed systems can be carried to products of a healthy delivery. So, mayonnaise sauce in which compounding and isolate of chickpeas protein is used as emulsifier and instead of a part of egg powder is characterized by the under content of fat and cholesterol. Vegetable sauce which compounding included proteinaceous components of a phyto-genesis – chickpeas flour and/or isolate of chickpeas protein falls into to group the bezglyutenovykh of products. At the same time the combination of components obeskepechivat high organoleptic characteristics of sauce, good smooth consistence and balance on nutrition and biological value. Introduction of chickpeas flour to a compounding of sugary confectionery instead of a part of granulated sugar allows to reduce power consumption, and high moisture-holding properties of flour from chick-pea promote extension of a shelf-life of finished products. Use of chickpeas flour instead of a part wheat in a compounding of flour confectionery promotes balancing of amino-acid structure and increase in biological value.

Table 2 Influence of additive of products of processing of chick-pea on protein content and mineral substances, power and biological value of foodstuff

Indicator *	Confectionery				Canned vegetables		Mayonnaise production
	flour		sugary		caviar	sauce	mayonnaise sauce
	cracker	gingerbread	candies	sherbet			
PPN content, % mass.	9,0	39,0–52,5	4,8	4,5	5,0	3,5–7,5	1,1–3,2
protein content, g:							
in 100 g of a product ($D = \pm 0,20\%$):							
Monitoring	8,79	5,6	1,40	8,75	1,70	2,10	2,76
Experience	11,20	9,2–10,6	2,20	11,74	2,39	4,40	3,25–4,22
in a disposable portion of a product:							
Monitoring	2,64	5,6	0,21	1,30	2,60	1,10–1,60	0,90
Experience	3,36	9,2–10,6	0,33	1,80	3,60	2,20–3,30	1,10–1,50
% of RSNP (75 g) on protein:							
Monitoring	3,5	9,7	0,3	1,8	3,4	1,4–2,1	1,3
Experience	4,5	14,1	0,4	2,3	4,8	2,9–4,4	1,5–2,0
Biological value, %:							
monitoring	65,0	64,0	78,9	82,5	77,2	82,6	82,9
experience	70,2	80,1–77,5	79,7	83,2	79,4	84,4	81,1–88,3
Content of mineral substances (ashes), % ($D = \pm 0,03\%$):							
monitoring	1,01	0,3	0,49	0,83	0,85	1,70	0,61
experience	1,67	0,7–1,1	0,65	1,16	0,88	1,90	0,85–1,35
Power value, kcal / 100 product g:							
monitoring	443,1	365,2	381,1	490,0	130,0	147,2	624,5
experience	438,1	353,7–57,7	375,4	466,0	149,0	103,6	616,3–619,8

* PPN – product of processing of chick-pea; D – definition error; RSNP – the recommended standard daily rate of consumption

For the purpose of complex deep processing of chick-pea the composition of afterproducts – meal (the insoluble rest after protein selection) and envelopes (tab. 3) is studied. These tables 3 demonstrate that meal contains residual amount of protein and in it the starchy fraction (about 70% for nonvolatile solid) prevails. At a mikroskopirovaniye of an exemplar of meal aggregate size of Amylum (15–25 microns) and their form are

established (oval). The technology of processing of meal with receiving Amylum including a series of washings and divisions on bolters is offered. It is shown that starchy afterproduct (meal) can be also used after an exsiccation in an integral form as fodder product. The exchange energy makes it about 12,8-13,0 MDzh/kg of nonvolatile solid (for KRS).

Table 3 Chemical composition of afterproducts of processing of chick-pea (in %)

Index	Meal after selection of isolate of protein	Envelopes of beans of chick-pea
Mass fraction of moisture	9,9±0,5	11,1±0,5
Mass fraction of protein on a dry basis	7,8±0,2	6,1±0,2
Mass fraction of fat	0,80±0,10	0,20±0,03
Mass fraction of ashes	1,16±0,03	4,20±0,03
Mass fraction amyllum on a dry basis	68,5±0,5	1,4±0,3
Mass fraction of a fat	3,8±0,2	37,9±2,8

Covers of beans of chick-pea are perspective raw materials for receiving food fibers which main advantage is a digestion normalization. Food fibers well connect water, bulk up, absorb organic molecules, bilious acids, promote exchange of cations. Water-retaining power (VUS) of the flour received from envelopes of beans of chick-pea in model conditions of an intestinal path is estimated. The highest VUS for flour from envelopes of beans of chick-pea is noted at pH 8,7 (401±9%). According to classification of food fibers by VUS of an envelope of beans of chick-pea it is possible to carry to srednevodosvyazyvayushchy (2–8 g of water on 1 g of food fibers).

Confectionery are in stable great demand and among adult population, and for children: in Russia retails reach 7,7 kg on one inhabitant. It is rather high rate in comparison with other East European countries (Savenkova, T.V. 2007).

Lack of confectionery is their imbalance on mikronutriyentny structure against the background of high power value. The analysis of the nomenclature of domestic confectionery production which is carried out by specialists of scientific research institute of the Confectionery industry (Evpatchenko, Yu.V. 2011) shows on need of correction of its chemical composition what is caused by the following factors: the high power value (460–590 kcal) at 35% of confectionery, about 260–390 kcal have only 6% of total amount of products, the significant amount of protein practically in all confectionery (no more than 2-8 g on 100 g of a product at norm for adults to 75 g

a day, children – up to 110 g a day); about 40% of production with the high content of fat (20–40 g / 100 g); almost at 60% of confectionery for 100 g of a product 70 g of carbohydrates on average are necessary.

Chickpeas flour is the perspective enriching component for creation of confectionery with the adjustable and in advance set properties, nutrition and biological value.

When developing new confectionery were guided by the recommendations of Scientific Research Institute GPU of a delivery of the Russian Academy of Medical Science in the light of the concept of a healthy delivery: decrease in content of sucrose, saturated fatty acids, trans-isomers of fatty acids and increase in content of substitutes of sugar, PNZhK, food fibers, essential minerals and vitamins, the biologically fissile connections having versatile physiological effect in minimum concentration including phytoestrogen, flavonoids, a selenium (Ivanchenko, O.B. 2008;Kurchaeva, E.E. 2011).

Cracker – the flour confectionery with the high content of fat differing in lamination and fragility. The cracker is made from wheat flour of the premium therefore in finished products the deficiency of such irreplaceable amino acids as a lysine and threonine is observed. The comparative analysis of amino-acid composition of the main raw materials – wheat flour and chickpeas shows that on the content of all irreplaceable acids of a squirrel of wheat flour considerably concede to chickpeas (fig. 1) (Ivanchenko, O.B. 2008;GOST 31663-2012 Vegetable oils and animal fats. 2010).

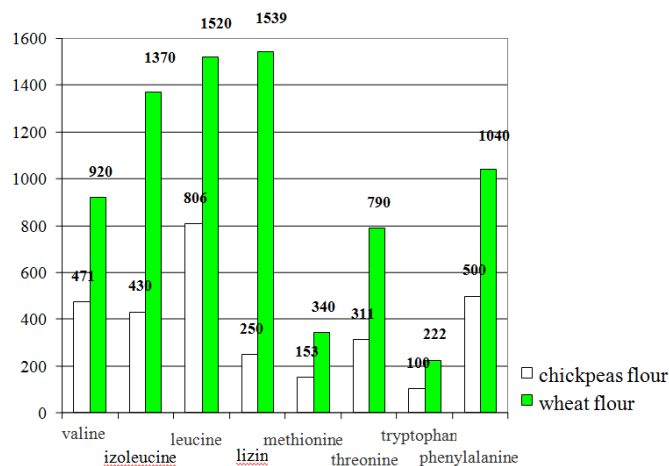


Figure 1: Content of irreplaceable amino acids in wheat and chickpeas flour,mg in 100 g of a product

Besides, wheat flour in comparison with chickpeas is characterized by lower content of micronutrients (fig. 2).

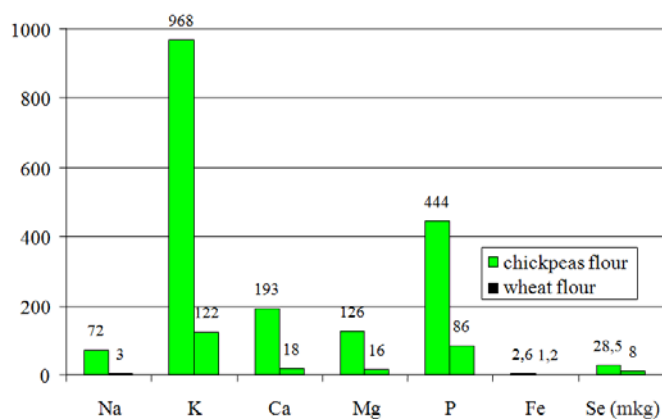


Figure 2: Makro - and micronutrients in structure wheat and chickpeas flour, mg on 100 g (96)

On purpose, increases in content of food fibers, crackers at preparation and baking of test pieces in a compounding of crackers tselnosmoloty chickpeas flour from grade chick-pea beans «Krasnokutsky 28» was used. Extent of replacement of wheat flour chickpeas made 5–15%.

It is established that at an importation (5–10) % of chickpeas flour organoleptic indicators of a cracker did not worsen. Increase in additive of flour from chick-pea up to 15% gives to a finished product specific smack of a bitter taste and bean aftertaste and worsens organoleptic indicators of cookies.

Besides, it is noted that at preparation of test pieces of a cracker with additive of 15% of chickpeas flour dough loses an elasticity and begins to be torn that is inexpedient for technological process. Apparently, it is bound to decrease in content of gluten in composite flour as the quantity and quality of gluten substantially define structural mechanical characteristics of the test.

4 Results and their discussion

Thus, chick-pea is ecologically safe nonconventional raw resource of a phytogenesis for creation of products of a healthy delivery. On the basis of a research of physical and chemical characteristics of beans of chick-pea of grades «Krasnokutsky 28» and «Privo-1» it is established that higher content of protein (24%) and separate amino acids and smaller Trypsinum - the inhibiting activity (2,33 mg/g) is characteristic of grade chick-pea «Krasnokutsky 28». In this regard for production of proteinaceous products (flour, isolate) it is preferable to use grade chick-pea «Krasnokutsky 28».

The analysis of fractional composition of proteins of chick-pea of grades «Krasnokutsky 28» and «Privo-1» allowed to recommend proteinaceous products of processing of chick-pea for application in technology of food with the under content of gluten (albuminous and globulinovy proteinaceous fractions, the maintenance of prolamines of 0,29 - 1,34%, the maintenance of glutelins of 1,63-2,01% prevail). And creations of the combined products for decrease in deficiency of protein in a delivery has the prospect of practical application in various food systems as a product of simple processing of chick-pea (chickpeas flour), and deep (isolates and concentrates).

Technology solutions on receiving new types of foodstuff – crackers are developed. The nutrition value, organoleptic, physical and chemical, microbiological indexes of a new type of foodstuff are investigated. Technical documentation on a new type of food products on the basis of products of processing of chick-pea is developed.

5 Conclusion

The complex characteristic of physical and chemical and functional properties is given, to nutrition value of products of processing of chick-pea – torments and isolate. The technology

solutions of use of products of processing of chick-pea proposed in work by production of new types of food products allow to expand a range of flour and sugary confectionery, vegetable canned food and sauces both for broad consumer demand, and for specialized groups of the population.

The article is written on the basis of the results of scientific research conducted within the framework of the state task of the State Educational Establishment of Higher Professional Education in the Moscow State University of Food Production for 2017-2019 on the theme 14.7404.2017 / BCh «Scientific and applied basis of application of traditional and non-traditional plant raw materials and secondary products of its processing (fruit, berry, grain, legume, oilseed, essential oil, herbs) in the technology of specialized products of food industry, cosmetology and pharmaceuticals».

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Primary Paper Section: G

Secondary Paper Section: EF, GE, GAGC



J INDUSTRY

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INSERTION OF TEETH INTO ENGAGEMENT AND THEIR EFFECT THE DEFORMATION OF THE ELASTIC WHEEL IN HARMONIC GEAR.

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The work has been supported by the KEGA 063TUKE-4/2016 research grant, titled "Metrological processing of biomedical data obtained by 3D scanners for educational purposes".

Abstract: Gearboxes represent the most prevalent and prominent type of transmission mechanism encountered in all spheres of mechanics. The harmonic toothed gear transmissions undoubtedly are a prospective technology. The existence of the flexible wheel within the harmonic gear which undergoes deformation during the process of usage requires a specific approach in the mesh examination of this gear.

Keywords: the harmonic gearbox, deformation, the flexible wheel, the teeth curve.

1 Introduction

Harmonic drive transmissions are noted for their ability to reduce backlash in a motion control system. The principle of operation of harmonic gears is through the use of a thin-walled flexible cup with external splines on its lip, placed inside a circular thick-walled rigid ring machined with internal splines. The external flexible spline has two fewer teeth than the internal circular spline. An elliptical cam enclosed in an antifriction ball bearing assembly is mounted inside the flexible cup and forces the flexible cup splines to push deeply into the rigid ring at two opposite points while rotating. The two contact points rotate at a speed governed by the difference in the number of teeth on the two splines. This method basically preloads the teeth, which reduces backlash.

2 Harmonic gearbox design

The harmonic gearbox consists of three basic components, which are necessary for a correct functioning of the harmonic gearbox mechanism (Fig.1).

Wave Generator:

The wave generator is an oval-shaped cam with a thin ball bearing placed around the outer circumference of the oval cam. The wave generator is mounted onto the motor shaft.

Flex spline:

The flex spline is a thin, cup-shaped component made of elastic metal, with teeth formed along the outer circumference of the cup's opening. The gear's output shaft is attached to the bottom of the flex spline.

Circular Spline:

The circular spline is a rigid internal gear with teeth formed along its inner circumference. These teeth are the same size as those of the flex spline, but the circular spline has two more teeth than the flex spline. The circular spline is attached to the gearbox along its outer circumference.

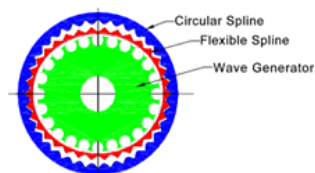


Fig. 1 Harmonic drive

The individual components (Fig.2) are mutually interconnected by the following links:

- A) Rotational link between the base body and the input shaft HP, in order to drive the WG,
- B) Rotational link between the base body and the output shaft, in order to drive the output element – FS,
- C) Flexible link between the WG and FS,
- D) Gear drive between the FS and C,
- E) Solid link between the CS and the base body.

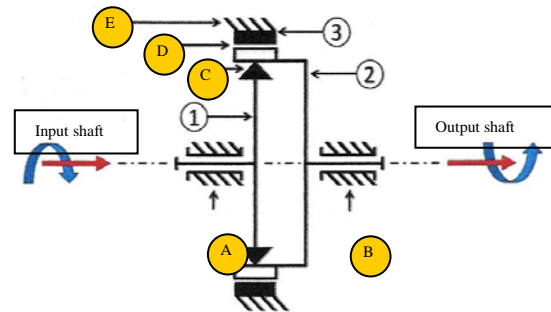


Fig. 2 Scheme of Harmonic Gearbox

A principle of the harmonic gear functioning is based on rotational-elliptical deformation of the flexible wheel. This deformation is generated by the wave generator, which is inserted into the open end of the flexible wheel. Gearing, which is situated on the external edge of the flexible wheel, is transmitting the elliptic form during rotation of the wave generator. In this way the gearing is rolling between the flexible wheel and the fixed wheel, which is firmly situated inside the gearbox.

3 The types of flexible elements of harmonic gear

Schematics basic types of elastic elements harmonic drive are given a (Fig.3). From a structural and technological point of view, the most complex hermetic elements (Fig.3 d, e, i) which are also stressed by temperature changes.

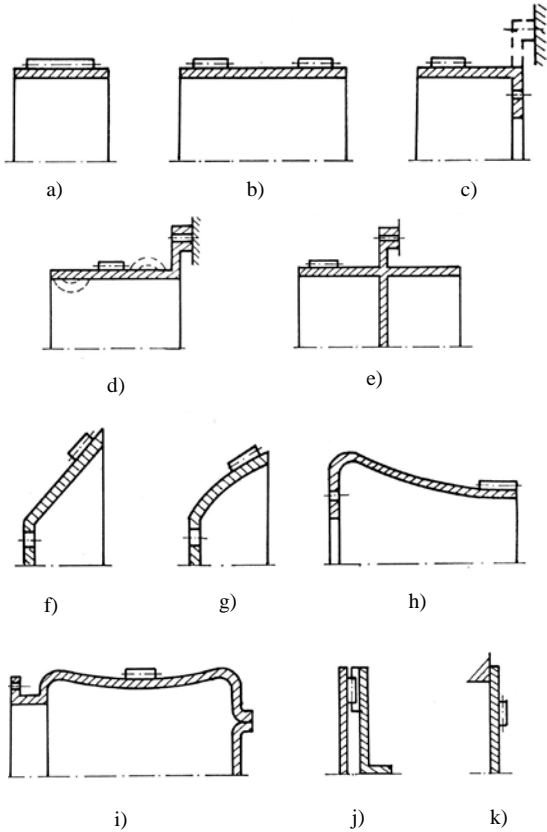


Fig. 3 Schemes types of elastic elements of harmonic gear

4 Insertion of teeth into mesh in Harmonic gear

Gearing of the harmonic gearbox belongs into the category of the internal gearings with a small difference between the numbers of teeth arranged on both wheels. This kind of gear drive is sensitive to an impact of tops of teeth during insertion of the flexible wheel tooth into the tooth space between the fixed wheel teeth (Fig. 4). Such collision can be eliminated using a suitable modification concerning active contours of tooth flanks.

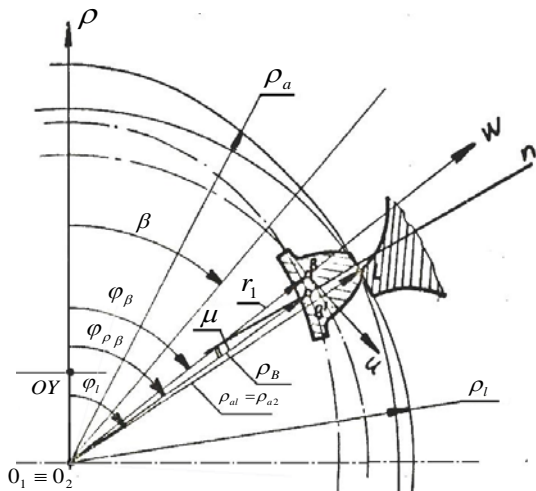


Fig. 4 Insertion of the tooth the elastic wheel into the gap between the teeth of the rigid wheel

Coordinates of the intersection point between both tops of teeth curves determine the initial moment of tooth insertion into the mesh. If the top of teeth curve in the case of the flexible wheel is an equidistant line with regard to the deformed central line, then equation of this line can be written in the form:

$$\rho_a \approx r_1 + w(\varphi) + \frac{ha}{\cos \mu(\varphi)} \tag{1}$$

where is: ρ_a – deformed top of tooth circle,
 h_a – addendum,
 w – shift in direction of the coordinate axes,
 $\mu(\varphi)$ – angle between the radius (vector) of the point on the deformed central line and the normal line in the same point.

Taking into consideration fact that the value of the angle $\mu(\varphi)$ is small in the case of real gears, i.e. $\cos \mu(\varphi) \approx 1$, then:

$$\rho_a \approx r_1 + w(\varphi) + ha \tag{2}$$

The intersection point between the tops of teeth curve of the flexible wheel and the top of tooth circle of the fixed wheel is determined by solution of the equation:

$$r_{a2} = r_1 + w(\varphi) + ha \tag{3}$$

Where r_{a2} is the top of tooth circle radius with regard to the angle φ .

The relation between the line slope angle φ of the investigated point K situated on the base central line and the line slope angle φ of the corresponding point K' in the analysed cross-section of the deformed surface is given by the relation:

$$\varphi_I \approx \varphi + \frac{u(\varphi)}{r_1 + w(\varphi)} \tag{4}$$

Where $u(\varphi)$ is a shift in direction of the coordinate axes.

The angular line slope φ_I of the intersection point for the curves of tops can be obtained by calculation of the angle φ from the relation (3) using the relation (4).

5 Flexible wheel deformation

There is a very small relative movement between the teeth in the toothed mesh. In reality this relative movement of meshing teeth happens in zones where their loading capacity is small, i.e. on their entrance into the mesh and on their leaving it. This deformation influences the shape of the active walls of the teeth of the flexible wheel. And as a result they do not mesh correctly. When properly selected parameters of gearing between the teeth of the flexible wheel - (a) a rigid wheel - (k), there is a relative movement along such a path, which provides a small slip of teeth - (sc) (Fig. 5).

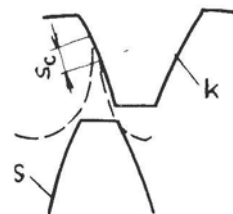


Fig. 5 Shot tooth flexible wheel and solid wheel

Primarily it is important to define the effect of the flexible wheel deformation on the tooth shape. The problem of the tooth deformation has been researched by many authors. So the flexible wheel is the limiting part of the harmonic gear's bearing power in direct coherence of an adverse wear. In the experiment conditions the tooth deformation is mostly determined by a static measurement of the tooth deformation loaded with a constant power or it is determined with the measurement of the divergence during a slow rotation.

The deformed shape in cross-sections 1, 2 and 3 is not constant, which ultimately introduces other nonlinearities into the rolling of the tooth profile (Fig. 6).

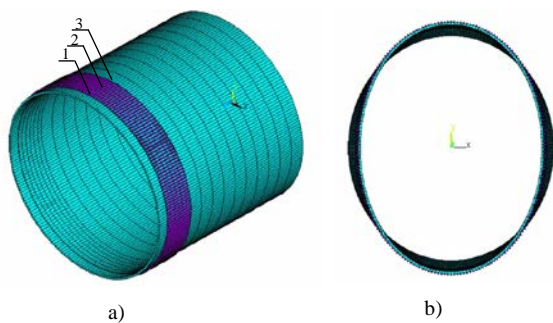


Fig. 6 a) shell and beam model of flexspline, b) deformation of the flexspline

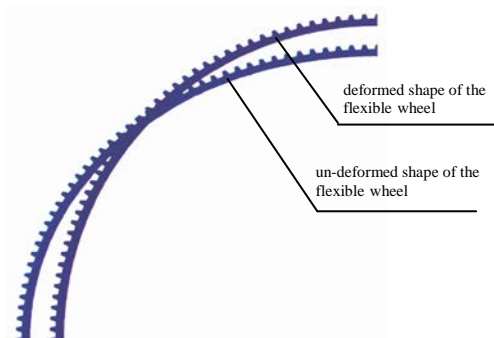


Fig.7 A comparison of the shape of the elastic wheel undeformed and deformed shape of the flexible wheel

Objective is to determine size the deformation of a flexible wheel harmonic transfer and subsequent tooth shape after deformation. After determining the shape of the deformed tooth it is necessary to design an appropriate shape of the opposite profile so when meshing the flexible wheel with the rigid wheel of the harmonic gear it would not cause interference. Tooth flanks solid wheel must be enveloping curves of the tooth flanks of the flexible wheel, but that is the aim of further work.

6 Conclusion

A harmonic gear is basically a differential gear with a train of spur gears where the mesh is achieved by the flexible deformation of one of the meshing wheels. The existence of the flexible wheel within the harmonic gear which undergoes deformation during the process of usage requires a specific approach in the mesh examination of this gear. The tasks of the mechanics of deformed bodies are generally the most important results of the nodal displacements, stress and deformation. After determining the shape of the deformed tooth it is necessary to design an appropriate shape of the opposite profile so when

meshing the flexible wheel with the rigid wheel of the harmonic gear it would not cause interference.

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Primary Paper Section: J

Secondary Paper Section: JR

PROBLEMS AND MECHANISMS OF DEVELOPMENT OF THE MODEL OF ACADEMIC PERSONNEL TRAINING FOR IRON AND STEEL WORKS

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This research was financially supported by the Ministry of Education and Science of Russian Federation within the framework of the project part of state task of Cherepovets State University № 11.3943.2017/4.6).

Abstract: The model of academic personnel training for iron and steel industry is proposed based on global trends in education considering the existing business opinion on required competencies of university graduates. The paper raises issues concerning planning of educational programs for research workers at the levels of bachelor's, master's and doctor's degree programmes, and interpretation of concepts, such as a problem, basic training, and a competency.

Keywords: competencies, model of a university graduate, model of academic personnel training, stuff preparing for iron and steel works.

1 Introduction

In the light of contemporary global trends of technological advancement and transformation of educational environment, business and industrial metallurgical corporations are encouraged to reconsider their approaches to requirements and results of specialists' education [1 – 5].

Economy digitalization – creation of 'an industry digital twin' – takes place within the framework of technological development. Information technologies penetrated into various industries and fields so deeply that ceased to be a science but became tools used in all areas, including sociological and humanistic spheres. Digitalization influences the standing of industry, science and education leaders in the market – in today's business, those who own data take everything.

Information technologies are used in the iron and steel industry in the areas of 'big' and 'long' data analysis and processing, predictive analytics, prediction of product properties, technology design, and applied programming [6 – 13].

Speaking of global transformation of education, the following facts and situations can be observed:

- fiercer competition between employers for 'talents'
- involvement of employers into evaluation of learning results
- advantage of 'practitioners' over 'theorists'
- education globalisation – classification and integration of higher educational institutions, opening of representative establishments of large universities all over the world
- orientation towards training of world-class experts
- creation of a single global base of university graduates
- geographical shift of educational markets: about 1.5 bln people will be studying in Asia by 2025
- movement of education into the network, reduction of the university value as of the physical space
- competition between universities for resources and selection of resources from all over the world
- origination of zones of elitist education within mass education in universities
- receiving of diplomas by those students who created start-up at the end of education
- loss of higher educational institutions to R&D-centres and corporate universities in intellectualization

All universities without any exception shall compete with each other and with corporate universities, creating elitist and unique educational systems and environment. What is a modern employer waiting from an elite graduate?

2 The Model of a University Graduate for Business.

A simplified model of a graduate is given on Figure 1. Why is the form like this? The answer is very simple. A wonderful epoch of Einstein is over, natural sciences converted into polyparadigmatics; the systematic approach burst being replaced by the complexity theory due to the lack of knowledge of boundaries of the systems studied.

Every modern employer is sure that it needs people with formed 'hard skills' and 'soft skills' [1, 14 – 17], and the more skill a specialist has the better it is. However, it is not clear how to evaluate soft skills acquisition, how and when they are formed in the process of education.

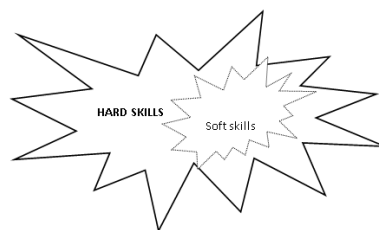


Fig. 1. A Simplified Model of a University Graduate

When developing iron and steel companies, one should rely on scientific personnel – extraordinary unique specialists who are graduates of elitist educational programs offered by universities. It should be noted that one of the challenges of modern universities and education is lack of standardization principles. It means that before providing the service to the user it is not known what quality and completeness the service would be.

In case if a list of competencies determined by business for academic personnel is known, then the task of a university is to answer the question 'How shall a specialist requested be trained?'

Instead of this, many universities start to formulate together with metallurgical companies more and more competencies of future elite academic personnel, assuming that the more competencies are put the higher will be the quality of a specialist. That is they make a typical mistake (Fig. 2): if the task of a subject is to jump over a precipice to the other side, in order to solve the task they start mistakenly to describe the other side instead of developing a new way of crossing.

In the situation described above, development of approaches to planning of educational programmes for academic personnel training is of great relevance. However, before representation of key planning ideas, it is necessary to evaluate special features of modern applicants for higher education and graduates of elitist programmes.

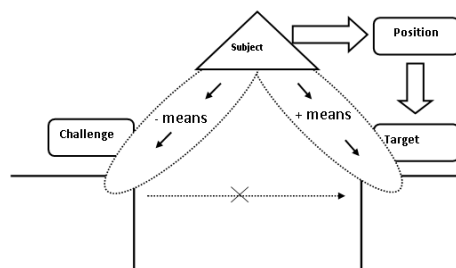


Fig. 2. Schematic Representation of Problem Solving

We have the younger generation who does not want to go to school and study at universities. They build levels in Minecraft, but have competencies of the future received in the on-line environment. If approaches to creation and organization of an educational process are not reviewed, current universities are risking to eradicate interests and talents of entrants. Business is also in a similar situation, as it is demonstrating students its worst production practices.

Graduates of university 'elitist programmes' shall understand that they will get a job in corporations or in the system of public affairs for sure, and only in this case a university will be a system influencing society changes, and it will be investing into educational elitism.

3. Planning of Educational Programmes for Academic Personnel Training.

When developing modern programmes for academic personnel training for production facilities, any researcher, head of a university or an industrial enterprise asks himself or herself the following questions:

1. In what area shall an educational activity be performed? For which tasks?
2. What markets shall be entered?
3. How shall one organize an educational process?
4. How shall one evaluate and monitor the results of an educational process?

Answering the first question, several problematic situations shall be formulated:

- a task-based approach prevails in university studies; there are no formulations and analysis of actual scientific problems
- a 'life tube' of an academic researcher is a pre-set trajectory
- a practice of copying others is popular: 'if we follow the Harvard's model, we will become it' despite the fact that there is a concept of 'reverse engineering' in technology – imitating, we copy not creating anything new
- training in problem- and solution-focused thinking is missing in education

When training academic personnel, the focus should be on consideration of inter- and multidisciplinary problems and tasks, for example: technologies of metallurgical enterprises and IT; CAE and CAD and electrical technology; economy, organization management, programming and IT, predictive analysis; CAE and CAD, IT, equipment reliability, diagnostics and predictive analysis; control system, process engineering, predictive analysis.

A discipline related circle with the centre of sciences intersection shall be formed at universities, and specialists shall be trained there for solving tasks, which have not been solved yet.

Answering the question 'What markets shall be entered?', some universities together with business start to study trends and markets discussing which place their university, graduates and specialists would take in the competitive environment, start to develop strategies and perform other managerial operations. Curious what market did Steve Jobs study, when there was no market of the product he was developing?! He imagined it, made it up! In the modern world, it is not people who compete, but systems, schemes, and finances. Universities shall compete only for future; they shall verify their each step with the 'future'.

The question 'How shall one organize an educational process?' is obviously the principal one in the process of academic personnel training. It has no universal answer. Figure 3 schematically shows a possible model of academic personnel training.

The suggested model is based on the 'base block'. It cannot be universal, and each university has its own original approach to basic training. For example, nowadays, programming can be the

first knowledge in universities. Learning about world issues, application of mathematical methods for solution of engineering tasks, and study of physical processes in technology are also relevant.

The base block has to include mastering of competencies for project activities, case-method, time-management, and structural linguistics. The best way to plan an educational program is to combine educational methods.

The block of variable trajectories is used for 'pumping' students within a certain topic, task, or project. At this stage, it is required to put together a team of like-minded people with a leader-scientist in the lead and an expert-consultant from a production facility. In this block, students shall independently and pro-actively navigate in the most relevant and prospective suggested topics of research and developments. Talents and leaders are identified as a result of training; skills of independent team work are acquired.

The 'multifunctional block' is purposed for students to acquire additional competencies, which would let them implement projects at the interdisciplinary level, approaching the problem to be solved from different directions. For example, it is reasonable for a specialist in metallurgical technologies to go into automated systems and power engineering; it will be useful for specialists in metallurgical equipment to study problems of electrical drives and reliability; as mentioned above, it is mandatory for specialists of all categories to study issues of big data analysis and processing and predictive analysis.

The suggested model of academic personnel training, shown schematically on Fig. 3 and described above, is referred to the basic bachelor stage of training.

If the next stage of academic personnel training – the Master's degree program usually taught for 2 years – is considered, its schematic model will look slightly different (see Fig. 4).

A graduate student shall be 'pumped up' with the theory of the basics within the chosen training direction during the first year of education. The student shall study enough of domestic and international scientific papers made in the form of publications, monographs, etc.

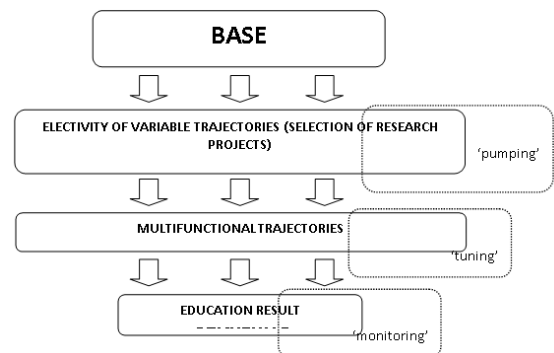


Fig. 3. Conditional Model of Academic Personnel Training

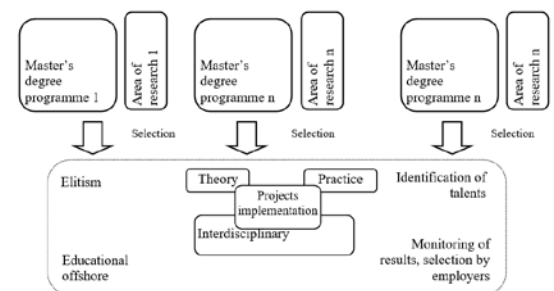


Fig. 4. Schematic Model of Students Training in the Master's Degree Programme

One of the problems all universities encounter is organization of acceptance control of applicants. Factors certainly influencing formation of an initial team of students of an educational programme and technically being difficult for expert evaluation are motivation, the depth of understanding of existing scientific problems and tasks, ability to find, formulate and understand the importance of the research project results.

In this respect, 'elitism' and a unique nature of the Master's degree programme shall be determined not only by an education programme itself, its name, content and/or teaching specialists-experts, but educational trajectories (a unique environment, an area), which can be implemented during the second year of education. In this case, after studying the basic theory and determination of research directions, the students are offered to continue education in so called 'educational offshore' — a place where graduate students of different directions can implement interdisciplinary research projects. Creation of specialized laboratories, work spaces, and availability of highly-qualified academic-teaching staff is required for the education offshore.

Such organization of Master's degree programmes helps to identify talented students and teaching staff capable to set scientific tasks, discuss and determine scientific problems. The results and process of education in Master's degree programme according to such scheme will be of the most interest to potential employers.

Speaking of academic staff training at the last education stage — the Doctor's degree programme, certain gaps in the university educational system shall be noted.

Usually, in postgraduate programmes modern universities are bringing up researchers-performers who can, at a high level, prepare publications for top-rated magazines, make reports at conferences of different levels, who deeply understand existing scientific problems and mechanisms of organization and control of research activity. However, doctor's degree programmes do not provide formation of such category of scientists as Principal Investigators. Alumni of post-graduate programmes are lacking independence, ability to form networks of scientific contacts, organize solution of scientific tasks and project, prepare applications for grants. This fact negatively influences the formation of 'scientific leaders', appearance of new areas of knowledge in various fields, including iron and steel industry. A postgraduate student is an individual product in science, having passed through several procedures of evaluation and sorting out at stages of bachelor's and master's degree programmes, therefore, an educational programme shall be formed based on the model of alumni (Principal Investigators), or based on formats of scientific work.

Fig. 5 provides a model of postgraduate student training. Compared to the Master's degree programme, the model is focused on one subject — a learner, rather than on a group of students. An education program might consider the following situations: only a student having its own research topic can enter a Doctor's degree program; upon admission, a postgraduate student is offered to solve scientific tasks at his/her discretion; a postgraduate student is offered to work in a team of researchers to solve an interdisciplinary task similar to the model of graduate students training discussed above.

When considering the question 'How can one evaluate what has already been taught?' there can be used both well-known monitoring methods, for example, tests and exams, or other approaches:

- evaluation of a cognitive style of a student (what he/she was like at the entry, and what he/she has become at the exit)
- evaluation of the project in general by the principle 'implemented' / 'not implemented'
- creation of a masterpiece, start-up, etc. by a student

Despite various approaches to evaluation of education results, the main result and the goal of researcher training is to 'create'.

Currently, HR-managers all over the world are seeking to formulate and evaluate competencies of employees of industrial enterprises [18 – 23]. Based on the suggested approach it can be concluded that a 'competent specialist' is a person, who is given a task, and he/she has qualification to perform this task; a 'competency' is a capability of a person (a subject) to participate in transformation; a competency belongs to a university alumnus, or a specialist.

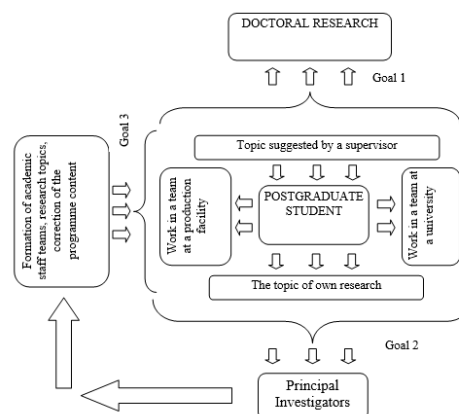


Fig. 5. The Scheme of the Postgraduate Students Training Model In considered schemes and approaches, a university shall be an operator of a solution, a development unit focused on preparation to statement and solution of scientific problems.

Conclusions

Any actively developing iron and steel company is committed to development of own elitist research and engineering personnel, and, consequently, it needs methodological, expert, organizational and technical support from universities.

When planning and implementing organizational programmes correctly, universities can ensure the development of industrial partners, since the development is planning of an object by a subject (a student, a researcher) in an area new to him/her. A subject cannot develop independently. He/she can only arrogate the results of the development of the system he/she is in.

During an epoch, when economy is based on knowledge, a university shall be a place for 'thinking', it shall change a person's thinking, generate ideas, perform valorization and develop approaches to implementation of changes, be in the environment, where 'new knowledge' is created, and create such environment by itself.

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Primary Paper Section: J

Secondary Paper Section: AM

CONTRADICTIONS BETWEEN THE USE OF CREDIT RESOURCES AND INVESTMENT NEEDS IN RUSSIAN REPRODUCTION

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Abstract. Nowadays, innovative development becomes a crucial component of socio-economic transformation. However, the Russian lending structure contradicts the interests of innovative development, although it reflects the needs of major segments of the national economy. The main objective of this research is to determine the possible options of banking sector modernization offered by modern technologies allowing to solve the accumulated contradictions between reproductive investment needs and lending practices. Analytical and theoretical results of our study have shown that the banking system does not meet the requirements of expanded reproduction and needs a significant change. The obtained results can be used to develop new technological bases of investment banking in the context of modern social and economic transformation.

Key words: innovation process, banking, reproduction, investment credits, small and medium-sized businesses, blockchain technologies.

1 Introduction

The innovative factors of development are now becoming the crucial component of socio-economic transformation. At the same time, the innovation process has the following trends: growing knowledge intensity, capital transfer to high-tech industries with high added value, creation of high-tech jobs, the change in the structure of production factors, reduction of transaction costs due to the formation of information and communication infrastructure, etc. In addition, information technologies influence the branch structure of national economy so that limited resources and economic costs are redistributed among different sectors and business areas (Abuzyarova M.I. 2011).

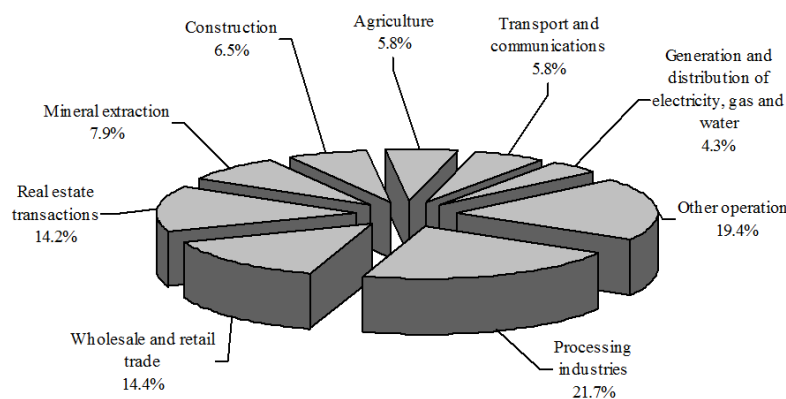


Figure 1: The structure of corporate lending by types of economic activity for a full range of enterprises in 2017 (the chart was compiled by the authors based on the data of: Report on the Development of the Banking Sector and Banking Supervision in 2016. - Moscow: Central Bank of the Russian Federation, 2017. - P.30).

It should be noted that small and medium-sized businesses (SMEs) play a particularly important role in the innovative development of national economy. It is indisputable that the

2 Methodology

Our analysis is based on the structure of corporate lending by types of economic activity, overdue debt dynamics, weighted average interest rates and the structure of credits turnover, capital dynamics and banking multiplier, showing a low attractiveness of bank lending for financing investment in the real sector.

3 Results

The structure of innovative process is defined by global, national and local transformational shifts. Global transformational shifts are characterized by the influence of postindustrial trends and the emergence of technological leaders - the countries creating the image of global economy. National shifts are presented by macroeconomic diversification of sectoral structure of production at the national level, and local shifts- by the relationship between traditional and innovative factors within the boundaries of productive and institutional structures (Vaskina M.G., Ishchenko-Pamukova O A., Movchan I.V. 2016). These structural changes demonstrate long-term trends in the technological development of existing industries.

It is important to note that all the changes in global economy are due to the fifth technological order, characterized by the presence of software, multimedia, global networks and the dominance of information and biotechnology. As a result, the most developed economies of the world use advances in science and technology to optimize production. The use of innovations gives significant competitive advantages both in the domestic and foreign markets, which allows to further increase the gap in socio-economic indicators between developed and developing countries.

The components of fifth technological order are not clearly visible in the structure of Russian corporate lending (Figure 1).

In 2017 a significant part of loans (about 50%) was issued to the enterprises engaged in economic activities such as: manufacturing (21.7% of the total volume of corporate loans to non-financial organizations); wholesale and retail trade (14.4%); real estate transactions (14.2%). The rest was distributed among enterprises engaged in other types of economic activity. Thus, the structure of lending is contrary to the interests of innovative development, although it reflects the needs of major segments of the national economy.

SMEs create additional jobs and favorable conditions for a socio-economic competitive environment, they contribute to the diversification of production, expansion of the consumer sector,

saturation of the market with a variety of goods and services, increased export potential, increased use of local resources, etc. In addition, it is the SMEs that ensure social stability, forming the middle class. And in many respects this is achieved by the fact that the SMEs are the main actor of innovative processes in the economy.

Given a highly-competitive market and limited production resources, one of the few ways of development for Russian SMEs is the implementation of innovations. Here, scale economies are evident: the possible negative effects of innovation are minimized due to the initially small size of enterprises, while the positive ones are maximized due to a relatively small amount of costs. In addition, small and medium-sized businesses ensure that the innovative products and services reach markets quickly due to the absence of long bureaucratic approvals. Besides, the SMEs introduce innovations oriented towards filling market niches, which do not attract large business by their relatively small size.

As a rule, SMEs make risky investments in the development and pilot implementation of R & D results, thus becoming a monopolist for a while, and then either enlarge the scale of production, or sell the rights on the product, or are absorbed. In turn, large enterprises use SMEs for pioneering work, and the government supports this in every possible way. In developed countries, a significant number of innovations are developed by small and medium-sized businesses. So, at least 46 of 58 largest inventions of the XX century belong to single persons, small firms, people who hadn't succeeded in large organizations, inventors from reputable firms (but of a different profile). Generally, in the advanced economies, SMEs provide about half of all innovations, the number of which per unit of costs is often greater than in medium and large enterprises, and their rate of their adoption is a third higher. For example, in the USA small enterprises introduce 25 times more innovations than large companies. The share of intellectual capital in the total capitalization of a US average modern high-tech enterprise reaches 85%. In the EU countries about 50% of GDP and 85% of employees are involved in small and medium-sized enterprises. In Finland, for example, the timber industry owning 0.5% of the world's timber stocks, accounts for 10% of the world timber products export, incl. 25% of quality paper market. In Russia, the situation with the development of small and medium-sized businesses and their innovative activity is radically different from that of developed economies. Thus, the share of SMEs in GDP and employment is at the level of 15%. The total share of enterprises implementing R & D results does not exceed 10%. And the share of enterprises that carry out research and development is even lower - about 1-2% (Stark R.F. 2011).

Nevertheless, in the blind pursuit of profit the banks ignore the objective needs of expanded reproduction, neglecting investment

of accumulation funds in the means of production, including innovative ones. Today, banks act only as profitably oriented commercial entities, minimizing their participation in the real economy, providing enterprises and businesses only with the working capital needs and allocating to households only consumer and mortgage credits. For many enterprises in the real economy, especially small and medium-sized enterprises, bank loans are not available. The paradox of this situation is that banks accumulate excess liquidity. Therefore, we have every reason to assert that in practice the Russian banking system absent itself from ensuring the most important thing - the economic growth of the country (Aganbegyan A.G., Yershov M.V. 2013).

There are many reasons for such behavior of Russian commercial banks in the current circumstances. According to experts' opinion, the list of key problems hampering the expansion of credit supply and investment in the real economy includes: the low level of capitalization of commercial banks; structural disparities of the national economy; a high level of credit risks, especially regarding long-term loans; absence of large independent banking structures and wide practice of syndicated lending; a deficit of commercially attractive investment projects based on world practice; the lack of economic incentives to lend to low margin businesses; weakness of normative framework at the federal level; poor law enforcement and low independence of the judiciary; weak intellectual property protection; absence of stable principles of interaction with state institutions; insufficient level of transparency of information on the financial position of enterprises in the real sector; shortage of qualified professionals; weak competition in the credit market; regional problems of the banking system; poor banking infrastructure (Rodnina A.Y. 2015).

At the same time, the tendency of increasing the concentration in the banking sector is quite stable and should also be taken into account (table 1). According to the values of the Herfindahl-Hirschman index, prevalent in international practice, the market concentration by main indicators of the Russian banking sector was at an average level. The index shows the degree of market concentration and takes values from 0 to 1, where 0 corresponds to the minimum concentration, 0-1 to the low concentration level, 0.1 to 0.18 to the average concentration level, 0.18-1 to the high concentration level. In 2016 the asset concentration index increased from 0.107 to 0.111 (average concentration level); the concentration index for credits and loans granted to non-financial resident organizations increased from 0.137 to 0.147 (average concentration level); the capital concentration index increased from 0.114 to 0.137 (average concentration level). And the index of deposits concentration decreased from 0.233 to 0.230, while remaining high enough (high level of concentration).

Table 1 Herfindahl-Hirschman Concentration indices of Russian banking sector*

	2014	2015	2016
Assets	0,108	0,107	0,111
Loans and other placing to non-financial organizations - residents	0,144	0,137	0,147
Deposits of individuals	0,213	0,233	0,230
Capital	0,103	0,114	0,137

* The table was composed by authors based on the data of: Report on the development of banking sector and banking supervision in 2016. - M: Central Bank of the Russian Federation, 2017. - P.17

In general, it should be noted that the share of top 200 credit institutions in the total assets of the banking sector increased in 2016 from 97.2% to 98.0%. Similarly, the share of top five banks in the total assets of the banking sector increased from 54.1 to 55.3%. At the same time, in terms of concentration of assets, the national banking sector is comparable to the banking sectors of several countries of the European Union. In particular, according to the Herfindahl-Hirschman index, Russia is comparable to the indicators from the middle of the rating list of the European Union countries by the share of top five banks in total assets.

A high level of overdue loans is an important factor reducing the investment attractiveness of the SMEs for commercial banks (Figure 2).

Specifically, the level of overdue debt (the share of overdue debt in the total amount of debt) for small and medium-sized businesses increased from 4.3 to 14.9% between April 2009 and January 2018. At the same time, the level of overdue debt of non-financial entities increased from 3.3 to 6.7%. Delta (the spread between the level of SME overdue debt and the level of overdue debt of all non-financial entities) increased from 0.9 to 8.3%. In January 2018, the SMEs overdue debt was at 15.0%

for loans in Russian rubles (7.9% for all non-financial entities), and as for loans in foreign currencies, the overdue indebtedness of SMEs was at 14.2%, while for the total of non-financial entities this indicator was at 2.3%. This clearly shows that the small and medium businesses have overdue debts 2 and more

times higher than large enterprises, hence the low attractiveness of SMEs for commercial lending, as well as the high level of lending rates, and consequently, the low availability of credit resources for investment purposes.

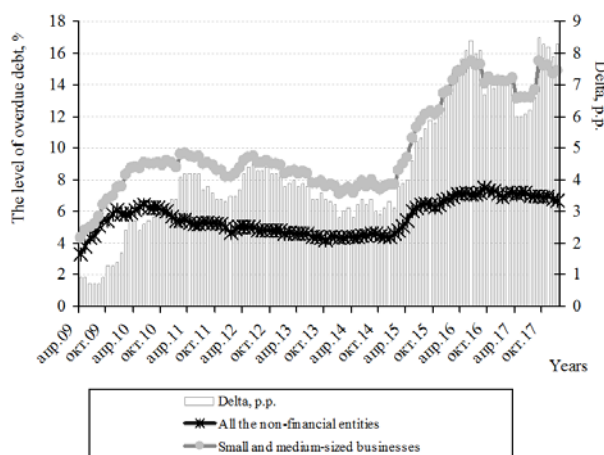


Figure 2: The overdue indebtedness dynamics (the ratio of overdue debt to the total amount of loans and borrowings for the corresponding period, in %) and delta (spread) in p.p. between all the non-financial entities and SME indebtednesses in the period between April 2014 and January 2018 (the chart was made by the authors based on the data of: Information on placed and attracted funds: Statistics (Electronic resource) // Central Bank of the Russian Federation URL: <http://www.cbr.ru/statistics/?PrId=sors> (дата обращения: 10.02.2018))

Consequently, small and medium-sized businesses often have a limited access to credit financing especially in crisis conditions. This affects both industrial investment rates (Galazova S.S. 2013) and regional investment process (Shanin S.A. 2012).

However, it should be noted that the interest rate for SME loans is significantly higher than for large enterprises.

Thus, in January 2017 (Table 2), the average interest rate charged on SME loans for up to 1 year was 14.43%, while for all non-financial entities it was at the level of 11.61%. The same is true for medium-term loans (from 1 to 3 years): 13.96% against 11.86%, and for long-term loans (more than 3 years) - 13.28% against 12.99%.

Table 2 Average interest rates (in %), maturity and turnover structure of ruble credits provided to non-financial entities by crediting institutions in 2017 *

Maturity	Up to 1 year	1 - 3 years	More than 3 years
Average interest rates on loans			
For all non-financial entities	11,61	11,86	12,99
For small and medium-sized businesses	14,43	13,96	13,28
Structure of ruble credits turnover			
For all non-financial entities	70,17	13,95	15,88
For small and medium-sized businesses	8,10	2,10	2,14

* the table was made by the authors based on the data of: Interest rates and the structure of loans and deposits by their maturity: Statistics (Electronic resource) // Central Bank of the Russian Federation. URL: https://www.cbr.ru/statistics/?PrId=int_rat (reference date: 10/02/2018)

Table 2 also shows that most of credits issued to the full range of non-financial entities in January 2017, was short-term loans - 70.17%. Medium-term loans (from 1 to 3 years) accounted for 13.95%, and long-term (more than 3 years) loans - for 15.88%. The similar pattern of credit distribution was observed in small and medium-sized businesses: 65.64% of loans issued to SMEs were short-term; 17.02% - medium-term; 17.34% is a long-term one.

As a whole, analysis of the structure and dynamics of loans to non-financial organizations suggests that crediting investment projects in the real economy does not seem attractive to banks. A high interest rate makes the investment lending with the loan term of 1 year or more unavailable. The situation is aggravated by structural disparities - preferential lending to the primary sector of the economy with its highest level of profitability, and small amount of credits issued to the manufacturing enterprises with their high share of R & D, but lower profitability (Berezinskaya O.B. 2016). The low inflation, the increased cost of credit for non-financial entities and the banking system

inconsistent to the global challenges, result, in fact, in a slowing economic reproduction (Burlachkov V.K. 2016).

The consequences of 2008 crisis in the US mortgage market (which quickly became an economic crisis of a global scale and led to a socio-economic downturn in almost all countries of the world without exception), suggest that the key reason of commercial interests prevailing over public ones is the turbulent process of "financialization" of developed and developing economies (Bulgakova A.V., Denikaeva R.N. 2016; Kiyutsevskaya A., Trunin P. 2016). This is especially noticeable in the outpacing rate of financial transactions growth compared to the growth of GDP and investments in fixed assets (Lisanova I.N. 2017). In the period from the 1980s until the crisis of 2007-2009, the financialization was fueled by a significant rise in savings, transformed into various kinds of securities. The steadily increasing amount of money circulating in national and global financial markets stimulated the investment not only in the non-financial sector, but also in the finance sector itself.

As a result, the financial sector development is far in advance of other sectors of the economy. Thus, in the period between 1990 and 2015 the aggregate nominal value of world financial assets increased from 42 to 294 trillion. USD. At the same time, the ratio of the financial assets to global GDP value increased from 195 to 375%. The ratio of the nominal financial assets value to the volume of investments in fixed assets also increased which generated a special world community's interest in the years of post-crisis recovery. In particular, in the period between 2009 and 2015, the aggregate annual volume of investment in fixed assets in real estimates remained almost unchanged in advanced economies (USA, EU, UK and Japan). But at the same time, the capitalization of stock markets in these countries has almost doubled, and total assets of national central banks increased more than 1.5 times (Paunovich I. 2016). According to the report of the UN trade and development experts, the financial flows gain their momentum and are expected to grow faster than the real economy (World Investment Report 2016).

4 Discussion

The process of financialization of the economy, where the modern banks play a key role, and financial crises are connected in the following way: during periods of prosperity, the economy moves from financial relations ensuring the stability to those that destabilize the system (Minsky H.P. 1992). In other words, the accumulation of huge financial assets and arrears during the economic recovery leads to an underestimation of risks and provokes the transition from hedged leverage to a speculative

mode of loan financing (Dubinin S.K. Financialization of economic growth and the Russian national financial system /2017). The downfall in the market value of speculative assets either turns into a financial pyramid, or leads to assets stripping. As a result, financial assets are depreciated and the financial system becomes destabilized. This mechanism correlates quite well to the subprime mortgage crisis and devaluation of housing-related securities in 2007-2009.

In general, the financialization process demonstrates the inconsistency of quasi-public character of commercial banks which is reflected in the divergence of commercial interests of banking organizations and the needs of expanded reproduction. Financial intermediaries' function of providing investment support to production needs is extremely important for expanded reproduction. Therefore, banks should ensure the accumulation of temporarily available funds from some economic agents and provide them to other economic agents, reducing the transactions costs of these economic agents and transforming the amount and life period of capital and associated risks. However, focusing on the pursuit of profit, commercial banks give access to credits exclusively to the enterprises and businesses that bring them fast profit. As a result, the credit channel ceases to provide real investments in the economy, necessary for the expanded reproduction of consumer and industrial goods and services. And the sectors that commonly contribute to the development of the national economy as a whole and serve the interests of social and economic development remain deprived of borrowed resources.

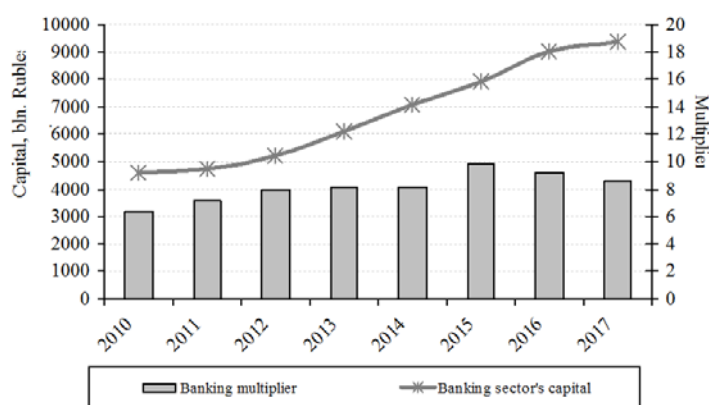


Figure 3: Capital (own funds) and multiplier of banking sector in the period between 2010 and 2017 (the diagram has been calculated by the author based on the data of: Report on the development of the banking sector and banking supervision in 2016. - M: Central Bank of the Russian Federation, 2017. - P.61)

In Russia, the process is exacerbated by a drop in the profitability of banking business, which can be seen in the excess of assets dynamics over the capital dynamics (Figure 3). Thereby, the multiplier of banking capital (financial leverage - the ratio of assets to capital) increased from 6.37 to 8.55 in the period between 2010 and 2017, reaching its maximum in 2015 (9.80). The increased multiplier allowed to level off the reduction of banking sector's profits under conditions of falling profitability. This was also facilitated by the planned increase in the banking capital - from 4.6 trillion. rub. to 9.4 trillion. rub. in the basic market prices (in real terms the growth was 20.6%).

When the banking system does not respond to the investment requirements of expanded reproduction, other resources are brought to the forefront of economic development. In particular, the population's savings, that can be invested under certain conditions (Tatuev A.A., Bakhturova T.V. 2014). However, this is not a solution to the functional problems of the banking sector.

To solve these problems, the banking system should undergo significant changes. The direction of modernization should be determined from the perspectives of formation and needs of new technologies in the managerial, organizational and financial

areas. The so-called cryptographic technology of blockchain meets the requirements of all the above directions. Regarding the financial sector, this technology is characterized by a large number of systemic advantages that are formed on the basis of distributed databases without the need to build direct relationships between the parties involved in credit operations. Besides, there is no need of third-party assistance in any transaction.

5 Results

Given these advantages, many financial structures, including the largest Russian banks, have already developed the relevant platforms and are absorbed in the task of corporate blockchain creation. However, in our opinion, the development of blockchain technology should receive the government's support, creating platforms that would integrate the acts of participants from a variety of local structures. Only in this way it will be possible to combine the advantages of the State and the private sector in a single technological chain of investment and financial support for expanded reproduction.

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Primary Paper Section: J**Secondary Paper Section: AE, AH**

