

CER Comparative European Research 2014

Proceedings | Research Track

of the 2nd Biannual CER Comparative European Research Conference

International Scientific Conference for Ph.D. students of EU countries

October 27-31, 2014 | London





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Introduction

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HUMAN RESOURCE MANAGEMENT AND HOFSTEDE'S MODEL OF SLOVAKIA

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Abstract: The article deals with the role human resources management, where we analyze several important aspects that are under this theme characteristic for the Slovak Republic. Briefly describe the importance and fundamental role of human resource management, which are focused on the issues of personnel management. In applying the concept of good human resource management is essential coherent and logical approach in any organization or business. Subsequently we characterized of access to Geert Hofstede monitoring of national cultural differences and discuss in detail the results of research through Hofstede's model focusing on the Slovak Republic.

Keywords: dimensions of national cultures, Hofstede's model, human resource management.

1. Introduction

Human resources management emphasizes the interests of management, the application of the strategic access, the understanding of human potential as corporate assets and the overall development of human potential. Over the last years it has been shown that the basic and primary source of competitive advantages of the company are its human resources upon which the determination of business objectives, formulating strategy and its successful implementation. This knowledge has been analyzing the post-transition economies in 1989 [6]. For Slovak organizations and businesses, the strategy of human resource management is very important, but according [5] mostly hidden. Slovak companies adhere to is opportunistic strategies that are largely implicit and nonverbal. Foreign investors do not seem to share strategic thinking with their head office "remote" Slovak cousins. Explicit and precise statements of human resource strategies were in SR not easily obtained [5]. Future human resource needs are determined by, the organization's mission, goals and strategies [9].

Why is it important to be aware of cultural differences? Culture is more often a source of conflict than of synergy. Cultural differences are a nuisance at best and often a disaster. Despite the evidence that groups are different from each other, we tend to believe that deep inside all people are the same. In fact, as we are generally not aware of other countries' cultures, we tend to minimize cultural differences. This leads to misunderstandings and misinterpretations between people from different countries [13]. Whereas individuals are the basic subject of psychological analysis, the socialization of individuals and their interaction with society is a matter to be studied at the level of families, peers, neighborhoods, schools, cities, and nations each with its own statistical imprint of culture [10]. Hofstede's cultural dimensions theory is a framework for cross-cultural communication, developed by Geert Hofstede. It describes the effects of a society's culture on the values of its members, and how these values relate to behavior, using a structure derived from factor analysis.

The theory has been widely used in several fields as a paradigm for research, particularly in international management, cross-cultural psychology and cross-cultural communication.

2. Meaning of Human Resources Management

Human resource management involves all management decisions and practices that directly affect people [2]. Human resource management is the process of managing people in a company as well as managing the existing inter-personal relationships. These two processes are keys in the success and growth of a business. Secondary role of human resource management is in management interpersonal relationships. This applies to employees within departments, as well as the organizational level. The relationship between employees and management is an important factor in the success of the organization, because sets the pace for how the organization will move forward in achieving their vision [15].

The two factors that most directly influence the human resources management process are employee labor unions and governmental laws, regulations. A labor union is an organization that represents workers and seeks to protect their interests through collective bargaining although only about 13, 90 % of the workforce in the United States is unionized, that percentage is higher in other countries. In Japan and Germany respectively, 24, 10 % and 32, 10 % of the labor force belongs to a union [9].

The human resource management is a philosophy of business relating to the management of human resources line managers and to achieve prosperity and competitive advantage of the company. The human resource management is a summary of procedures designed to manage and develop human potential in enterprises [6]. Are known three categories of factors that affect the likelihood that the company will enter on the path of rapid growth, namely [4], [11]:

 human resource capabilities, the first group, considered by many researchers as a key refers to the capacity of human resources, in particular the skills and characteristics of the founder and leader of the company. Human resources can affect the growth of enterprises through the adoption of an entrepreneurial orientation. It is defined in three dimensions innovative behavior, proactive behavior, the willingness to take the risk [1],

- strategic factors, the second group refers to strategic factors. It encompasses setting relevant strategic objectives, choosing an appropriate market definition and business model, defining strategy with the relevant and in addition unique skills, competencies and knowledge, innovative strategies, and the adequacy of the strategy to the environment,
- firms characteristics, the third group consists of the characteristics of companies, including, among others, technological factors, the legal form of the company, its size, location or relationships with other companies. Many studies have shown that advanced technology, as well as focus on knowledge in enterprises lead in the scale of economies to the increase of employment, increase of companies' sales, as well as creation of new and innovative products and services and as a result the rapid growth of such enterprises.

The meaning and value of studying management consists of [9]:

- The universality of management: good management is needed in all organizations and bussines.
- The reality of work: employees either manage or are managed.
- Rewards and challenges of being a manager: management offers challenging, exciting and creative opportunities for meaningful and fulfilling work. Successful managers receive significant monetary rewards for their efforts.

The human resource management process is defined as the eight activities necessary for staffing the organization and sustaining high employee performance. There are eight steps in the process as shown in the following exhibit.



Figure 1: Process of human resources management [9]

The main tasks of human resource management are considered [6, p. 15]:

- consistency between the number and structure of jobs and the number and structure of employees so that the requirements of each job correspond working capacity of employees,
- implementation of an appropriate style of leadership,
- optimal use of skills and ability of workers,

- optimal use of working time,
- respect for interpersonal relationships in the workplace,
- management of career.

Human resource planning is the process by which managers ensure that they have the right numbers and kinds of people, in the right places and at the right times, who are capable of effectively and efficiently performing assigned tasks to assure that the organization reaches its objectives. Managers begin with a current assessment of the human resources, and review their status [9]:

- This is typically done through a human resource inventory.
- Another part of the current assessment is the job analysis, which is an assessment that defines jobs and the behaviors necessary to perform them.
- From this information, management can draw up a job description, which is a written statement of what a jobholder does, how it is done, and why it is done.
- Also, management can develop a job specification, which is a statement of the minimum acceptable qualifications that a person must possess to perform a given job successfully.

Staffing is an essential part of human resource management and discusses guidelines and procedures for conducting the recruitment and placement. Well-developed staffing procedures will assist in effective advertising and addressing potential employees. On top of this, the person interviewing and selection of new employees should be able to identify suitable candidates for various roles. The interview should be structured so as to ensure the success of the interview, as well as the selection of suitable candidates [15].

2.1 Development of human resources management in Slovakia

In this particular article of human resource management will be discussed, and in particular we will focus on the Slovakia. The skills need to be effective in a market economy and It is necessary to have a strategic perspective here. It is interesting that the communist system of money was often less important than access to many workers. This approach after the fall of the Berlin Wall changed and value of money began to increase rapidly. Money has taken over as the primary human resource driving factor instead of connections taking the first place before. Culture is another factor affecting this area.

According to [5] is corporate philosophy in Slovakia focused on long-term growth, which is based on a strong market share. The owners, from 1991-1995, reinvested their substantial gains in growth and education of their employees, but this time also owners have changed their Skoda and austere lifestyle for BMW and large villas. Reinvestment policy began to make way for the marketing concept based on new strategies and new logo to make the company "brand" highly visible and well-known.

Society is divided into three different groups of primitive, archaic and the modern. The key things needed to form the primitive society are religion, language and technology. Archaic society needs social stratification and cultural legitimization. Finally, the modern society needs for example money and markets or bureaucratic organization. The transition between a primitive and an archaic society brings differentiation and stratification [7].

In Slovakia there are some elements of the primitive society. The place where people are born is often the place where they settle and work. Most of the people observed in companies in Slovakia were born and raised very close to the work place.

Also, the fact that people in Slovakia depend strongly on having family and friends in the right positions was discussed, so that the career goes the right way for them. In Slovakia, the thought of where you belong is very important with the fact where you come from and who you know. If a person has the right contacts with influential people you can make a difference. The gap between management and workers is enormous here. In the West this gap is filled by staff experts. This is missing in Slovakia. It does not matter how good you are, but more importantly how many people you know. The manager's level of authority is mostly linked to his social background and the class position of the family.

In the western Europe, the practicalities of applying the principles of human resources management and development of people constantly reviewed research activities of many leading research institutes and universities in the eastern Europe, this intellectual support began to stagnate before ever had the chance to start. Problems are mainly financial and personal reasons, thus the SR differs from the western countries in human resources management this matter [14].

Political elite of Slovakia is very focused on their own interests is not truly committed to the welfare of society. Nostalgia for holism primitive society is a major obstacle for innovation, modernization. SMEs have poor domestic support and faced major difficulties when forced to compete with world standards. Slovak products were not effectively adapted to the requirements in 1990, these requirements are related to either quality or design. Slovakia's economy is too dependent on the western industries (especially in metalworking), norms and values needed for adaptation are far too weak [5, p. 225].

3. Characteristics Hofstede's cultural dimensions

Cultural differences are still significant today and diversity tends to increase. So, in order to be able to have respectful cross-cultural relations, we have to be aware of these cultural differences. With this model, Geert Hofstede shed light on these differences. The tool can be used to give a general overview and an approximate understanding of other cultures, what to expect from them and how to behave towards groups from other countries [13].

Theoretical framework of cultural dimensions of Geert Hofstede introduced as a result of the assessment value of more than 100,000 IBM employees from 50 countries represent one of the most important contributions to the development of intercultural studies. Hofstede distinguishes culture based on the following dimensions: individualism versus, collectivism, power distance, uncertainty avoidance, masculinity against femininity, and long-term to short-term orientation [12]. Hofstede's six dimensions model allow international comparison between cultures:

- Power distance index (PDI).
- Individualism (IDV) versus collectivism.
- Uncertainty avoidance index (UAI).
- Masculinity (MAS) versus femininity.
- Long-term orientation (LTO), versus short term orientation.
- Indulgence versus restraint (IVR).

3.1 Hofstede's model of Slovakia

Geert Hofstede's model will be discussed in particular to Slovakia and this Hofstede's model includes power distance, individualism, masculinity, uncertainty avoidance, pragmatism and indulgence.



Figure 3: Hofstede's model of Slovakia Source: own processing by [16]

Power distance - expresses the inequality amongst the people. Hofstede talks about the actual extent to which the less powerful workers of companies and institutions accept the fact that the power is not distributed equally. In Slovakia power distance has 100 points which is very high. This does not have to be negative but also not very positive. This means that even though a manager of a company which is very highly qualified has to earn respect for the people to follow.

Individualism - this discussed the interdependence amongst the members of staff in a particular organization. In an individualism society the people particularly look after themselves and their closest family only. On the other side there a members that like to work in groups more. In Slovakia the score achieved was 52 points, this means people have no real preference when it comes to group or individual work.

Masculinity - points scored (100), indicate that the society is driven by competition, this can often be a huge problem. The question here is what motivates people? Do people want to be the best or would they rather love what they do? There is a different answer according to the gender, men want to be successful and be in a high position. When it comes to women, a job they love is more important. Status is a very important part of this, because men in particular want to show what they achieved and which standard of living they have. According to [3] belongs to the masculine values focus on material success and desire for recognition. Since men are more expected competitiveness and assertiveness, the women milder and softer behavior and focus on quality of life.

Uncertainty - this area has a result of 51 points, which show uncertainty or the fear of unknown is not really a big topic that Slovakian people worry about. The people do not feel threatened or worried by this.

Pragmatism - this topic relates to the fact that so much that happens around us cannot often be explained. The points 77 show that the people try to explain as much as possible. Although societies with a pragmatic orientation do not have a need to understand and explain everything fully as it is believed to be impossible, but Slovakia clearly has a pragmatic culture. This means they show an ability to adapt traditions easily for example.

Indulgence - this shows the extent to which people control their desires and impulses based on the way they were raised. Weak control of these desires and impulses is called indulgence, strong on the other hand is called restraint. Slovakia has a culture of restraint, as the control is strong 28 points. A culture can be either restraint or indulgent [16].

4. Conclusions

Achieving competitive advantage in human resources management must be included in the overall management approach. Individual activities and do not remain isolated, but form a coherent system. If this intention penetrates the whole organization, there is a chance that the company will achieve the established objectives.

Among the topics that impressed me the most from this particular article, the findings relating to Slovakia. In short, knowledge, recognize that:

- Money as a primary human resource driving factor.
- The culture and its conflict resolution which is taken as a totally destructive and therefore the people avoid too close interaction with each other.
- The most interesting element was that most people in Slovakia were born and raised near of their work.
- The fact that a person needs to achieve respect even with a very high educational/ qualification level.
- Power and authority play a major role, when you know the right people you can achieve something.
- The social status of the family and the person's background can influence the position taken.

Different culture means different priorities and habits. For example in Slovakia conflict is taken as an absolutely destructive instead of meaning the expression of ideas, clarifying of goals and achieving them. This means the whole interaction is affected and therefore the quality of work can be affected too. Therefore the Slovaks try to avoid it completely as it is thought of being a life and death situation. Different practices should be introduced according to the actual culture and values as open discussions cannot be developed easily. A big problem is also unplanned human resource behaviour. In conclusion we agree with the view [15], that the main focus of human resource management are people in the organization and for successful human resource management is important to regularly planning, monitoring and evaluation. Successful implementation of human resource management will

ensure that all employees are aware of their roles, career path and also feels to be part of an organization that is able to manage and align their expectations, as well as those of the organization and its objectives.

References

[1] ANDERSSON, S. - WICTOR, I. 2003. Innovative internationalisation in new firms: born globals – the Swedish case, Journal of International Entrepreneurship, Vol. 1, No. 3, pp. 249-275, 2003. ISSN 1570-7385

[2] FISHER, C.D. – SHAW, J.B. – SCHOENFELDT, L.F. 1995. *Human Resoure Management*, 3th edition, Houghton Mifflin, 1995. 864 p. ISBN 978-0-395-74886-2.

[3] HOFSTEDE, G.- HOFSTEDE, G.J. 2007. Kultury a organizace: software lidské mysli : spolupráce mezi kulturami a její důležitost pro přežití. Praha : Linde, 2007, 335 s. ISBN 978-80-86131-70-2.

[4] KNEŽEVIĆ, B. - DELIĆ, M. - KNEGO, N. 2014. International Business from the Central European Perspective. Zagreb : University of Zagreb, Faculty of Economics and Business, 2014, 146 p. ISBN 978-953-6025-89-3

[5] LETICHE, H. 1998. *Transition and Human Resources in Slovakia*. Personnel Review, Vol. 27, No. 3, pp. 213-226, 1998. ISSN 0048-3486

[6] MIHALČOVÁ,B. - PRUŽINSKÝ,M. – JANÍČKOVÁ, J. – OLEXOVÁ,C. – PRUŽINSKÁ,J. – GAVUROVÁ,B. 2007. *Riadenie ľudských zdrojov*. 1. vyd. Bratislava : Ekonóm, 2007. 226 p. ISBN 978-80-225-2448-3.

[7] PARSONS, T. 1965. *Theories of Society: Foundations of Modern Sociological Theory*, The Free Press, New York, NY

[8] REIDY L. 2003. *Make That Grade*, 2nd edition. Dublin 12, Gill & Macmillan Ltd

[9] ROBBINS, S.P.P. – COULTER, M. 2005. *Management*, 8th edition. Pearson Prentice Hall, 2005. 608 p. ISBN 978-01-3143-994-8.

[10] SMITH, P.B. 2004. *Nations, Cultures and Individuals: New Perspectives on Old Dilemmas.* Journal of Cross-Cultural Psychology, 35, pp. 6-12.

[11] STOREY, D.J. 1994. Understanding the Small Business Sector. Thomson Business Press, London, 1997

[12] http://research-methodology.net/hofstedes-cultural-di mensions-2/

[13] http://www.msc.pef.czu.cz/msc_em/data/HarveyJ/13
14 /Geert%20Hofstede. docx

[14] http://www.ibispartner.sk/sk/ludske-zdroje/435-budo vanie-konkurencnej-vyhody-firiem-cez-rozvoj-ludi-cestaaj-pre-slovensko

[15] http://humanresourcesguide.net/what-is-human-resour ce-management/.

[16] http://geert-hofstede.com/slovakia.html.

IMPACT OF QUALITY MANAGEMENT SYSTEM ACCORDING TO STN EN ISO 9001:2008 TO COMPANY PERFORMANCE

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Abstract: Quality must be in synergy with the company performance and its future depends on its ability to create added value in organizations. The question is to what extent the quality management system contributes to achieving increased efficiency in fulfilling company objectives? Several previous studies have tried to understand the relationship between quality and company performance, in order to ascertain the usefulness of the introduction of the quality system in the company. For many years quality has become the main principle on which is based change management in the company. In the study, we analysed whether the company has an impact on business performance; in addition to a quality approach, which implements in the organization. The aim of this paper is to evaluate the effects of this approach to business performance.

Keywords: quality management system, STN EN ISO 9001:2008, company performance, measurement, product

1. Introduction

Simultaneously dynamically developing and changing economic environment puts companies with the problem of ensuring long-term competitiveness. The decisive factor towards the inside of the company also represents quality management system in the company. This requires implement in practice new methods of management and changes in approaches. The basic objective is to increase efficiency, business performance and product quality.

A very important factor is the actual attitude of the leadership company, whether and how to it use a documented quality management system in its favor. The introduction of quality management system brings changes that relate to people and their work. Implementation of the quality management system is not easy, an important task is company culture. It is necessary to create appropriate conditions, adequately motivate people, create a creative atmosphere, encouraging teamwork and communication. If producers want enforce on the market they must produce products with such properties as the customers demand.

The quality management system has become a condition for successful business. Condition for the successful business it is not only the implementation of quality management system, but its functionality under all conditions.

2. Financial measurement of the quality management system

Each company which introduced process management, must its individual processes constantly evaluate and continuously improve their performance and efficiency. Financial measuring the processes of data for collecting and analysing various types of expenditure that are carried out with a view to translate all the technical and organizational measures in quality to the easily understood language - language of money. The process is a set of activities that transforms the tangible and information inputs on tangible and information outputs through resources and in controlled conditions. An example is the model EFQM and STN EN ISO 9001:2008, which requires the measurement of process performance (required measurement), the ISO 9001:2008 requires that all processes included in the quality management system were measured, that represents additional demands on resources and the creation of a measurement methodology. Performance measurement process includes activities that provide objective and accurate information about individual processes so that these processes can be continuously operatively managed in order to fulfill all the requirements that are imposed on processes. Important role in the measurement processes have only owners of processes where the processes are implemented. The owners do not directly perform measurements, but their competence is to know the results of measurements and use them for decision making. If we want to change the change of outputs, we need to manage the changes of the inputs and the process itself.

Quality objectives are quantified characteristics of products and processes to be achieved by organization at a specific date in the future. Quality Management System according to STN EN ISO 9001:2008 strictly requires that quality objectives are planned for all organizational levels. Quality objectives must be in line with the company's strategic statement - quality policy, which formulates the overall strategic objectives with regard to quality. If the company wants to measure process performance, it must [3]:

- declare the quality policy,
- define quality objectives throughout the organization,
- reallocate objectives for all organizational levels,
- establish performance indicators for an organizational unit,
- derive adequate performance indicators of processes the organizational unit.

Measure performance without defined quality objectives, is not real. A quality management system according to STN EN ISO 9001:2008 does not require this measurement. The aim is to find out (in the management review process), if company's quality management system fulfills two dominant roles [1]:

- maximizing customer satisfaction and loyalty, and
- minimizing expenses associated with it.
- Quality management system is manifested by significant economic and social effects:
- in the external environment of the company,
- inside the organization.

To increase the added value and quality of the company contributes a review of the leadership, which must represent a systematic process (outputs from one process are inputs to another process). Suppliers of the process are owners of measurement process, customers of process are employees, owners, units which carry out improvement projects [4].

2.1 Process Performance Measurement

Organisations should measure and monitor their processes, because of its performance monitoring. However, if the organization has a quality management system certified according to STN EN ISO 9001:2008 so processes must be measured on the basis of the liability that results from this certification. One of the requirements of ISO 9001:2008 is a measurement of processes, specifically in article 8.2.3 of this standard called Monitoring and measurement of processes it says that the organization must to apply suitable methods for monitoring and according to condition also processes measurement of quality management system. These methods shall demonstrate the ability of the processes to achieve planned results. If they are not achieved planned results it must be performed appropriate redress and transferred remedies "[9].

Performance measurement of processes requires as one of the requirements of ISO 9001, but a set of standards ISO 9000 does not define the term performance. Performance aptly defines the EFQM Excellence Model as a measure achieved results by individuals, groups, organizations and processes [7].

Company performance management is a process by which company management affects company performance towards achieving the set objectives [8].

By the term measure the performance of processes we can understood activities to provide objective and accurate information about individual processes so that these processes can be continuously managed by process owners in order to fulfill all requirements imposed on the process. We know the different types of process performance indicators, which include:

- universal performance indicators processes,
- performance indicators of production processes,
- indicators of non-manufacturing processes,
- measurement of performance for deviations,
- measure the performance of using Performance Index.
 For right choice of indicators to measure process performance we define the following procedure:
- accurately define the process by which we measure performance (leadership of the organization or the management of organizational unit),
- set up a group of tested employees to the choice of indicators (by owners of the process),

- apply brainstorming on the topic the choice of indicators to measure process performance, which was hosted and conducted by the process owner,
- selection of the most appropriate indicators from brainstorming of the proposed a range of indicators so that their application did not mean inefficient increase in labor input, but to maintain their maximum explanatory power of the actual process performance,
- proposing mathematical relations for the calculation of selected performance indicators processes,
- establishing the necessary input information for the calculation of performance indicators by owners the process.

In determining the performance indicators we must take into account the requirements of internal customers of the process. In the whole process has a process owner a large role, i.e. person who is responsible for the results and efficient operation. This task is dictated by that for measuring performance of a process is owner always the most important customer, or a person who personally performs the measurement. Therefore depends on the quality of selection indicators, from which will regularly adjudicate the effectiveness, respectively inefficiency continuance controlled process [6].

2.2 Universal indicators of process performance

By the term measure the performance of processes we can understood activities to provide objective and accurate information about individual processes so that these processes can be continuously managed by process owners in order to fulfill all requirements imposed on the process. Universal indicators of performance measurement of the process are usually associated with the following categories:

- time, when we calculate the duration of continuous process,
- quality, reported by extent of discrepancies in%, and so on.,
- flexibility, ability to respond to changes in the process (dynamic characteristics of the measured process),
- costs, for example. total cost of the process,
- impact on the environment, for example. noise level.

Some universal performance indicators of the process [2]:

a) *The total continuous duration of the process* T_p given in units of time:

We are talking about the time that elapses from the time of the adoption inputs to the process after the deliver moment the outputs to the internal or external customers. The total duration of continuous process could be expressed as follows:

where:

 T_{proc} is the processing times of inputs to which it applies $T_{proc} = T_{procl} + T_r$

 $T_p = T_{proc} + T_v + T_{ht} + T_c$

 T_{proc} 1 time of the first processing of inputs

 T_r processing time of inputs during repairs

- T_{v} time verification of compliance in the process
- T_{ht} time of handling and transportation in the process

 T_c time of calm

b) *Effective use of the duration of the process* V_{ef} indicated in percentages:

$$V_{ef} = \frac{T_{proc1}}{T_p} \times 100$$

c) *Total cost of the process* C_p indicated in monetary terms:

$$C_p = C_c + C_d$$

- Where N_c is the cost of compliance in the process of N_d and the cost of discrepance in the process.
- d) *Effective use of costs* C_{ef} expressed as a percentage:

$$C_{ef} = \frac{C_c}{C_n} \times 100$$

Universal performance indicators of process are indicators that have universal character and can be used during the whole measurement.

2.3 Performance indicators of production processes

The production process is the process of transforming tangible inputs to tangible outputs at the production workshops. Indicators of this type are normally used for the purpose of operational management of production.

Examples of indicators for measuring performance of production processes:

- productivity of employee, machinery, capital,
- input use,
- ratio of material costs to a value of identical outputs,
- average profitability per employee,
- overall efficiency of equipment,
- observance of standards performance machines and employees,
- value of work in progress,
- the number of days of remaining inventory in production,
- proportion of discordant products at the output,
- structure of continuous time process,
- the number of worked hours to output, suggestions for improvement
- flexibility to react to changes in production and under.

Indicators of non-manufacturing processes

Non-manufacturing processes are all others processes that are within the implementation of product in the organizations:

- processes prior to production (e.g. Marketing research, development etc..)
- processes during production (e.g. Repair tools, testing, maintenance, etc..)
- processes after production (arrival, service, etc..).

Examples of indicators for measuring performance nonmanufacturing processes:

• indicators to measure the performance of the process design and product development,

 indicators to measure the performance of the process of maintenance, purchasing, customer service, etc..

Performance measurement according to deviations

It sets the absolute deviations from the legislative, normative requirements or customer requirements. Examples of indicators:

- delayed delivered tangible and information inputs,
- errors tools, equipment etc.,
- unprepared respectively incompetent worker etc.

2.4 Performance measurement processes using Performance Index

This method is suitable for monitoring project implementation of continuous improvement and in the implementation of corrective actions extensive nature. It uses special formularies and uses already suitably determined performance indicators for which must be known method of their calculation. Changes in these parameters are observed mainly in terms of planning or approximation to the target values of these indicators so the owner of the process is allowed to operational affect the further course of processes on the basis of the data about performance index.

In applying this method, we distinguish two stages:

- phase of making form for determining performance index,
- phase of own performance measurement.

In the phase of making the relevant forms are recommended observe the following procedure:

- define quality objectives for the monitoring process,
- selection of performance indicator for description of monitoring the achievement targets.
- 1. Determination of initial value for each of the performance indicators. This value is based on at least three previous period and entered in row 3, i.e. in the line, which characterizes the third stage of performance monitored process.
- 2. The establishment of target values for each of the performance indicators. These values should correspond to the previously defined objectives and entered in line that indicates 10th the degree of performance.
- 3. Determination of partial performance targets that correspond to planned values of indicators on performance level from 4 to 9 These partial objectives determined by experts based on experience, respectively partial plans and entered in the line to the appropriate level of performance.
- 4. Determination of minimum bearable level of performance, i.e. such values of performance indicators that characterize most adverse circumstances and are recorded in line 0.
- 5. Determining and writing the values of performance indicators for performance stages 1 and 2 based on expert estimates and experiences.
- 6. Determination of severity (weights) for each of the performance indicators so that between all the proposed performance indicators are divided 100

points and these values are recorded in the line "weight".

7. Reproduction of the prepared form and training of responsible employees for measuring the performance (i.e. explanation of the nature and practice of records).

After this implemented preparatory phase is possible chosen process monitoring and measure its performance using Performance Index.

6. Conclusions

Maintenance and improvement of the quality management system is the basis for success of each company. However, it is a pity that nowadays considered this fact, most top managers as unimportant and advises it into the responsibility of the quality department. For ensuring the future prosperity of the company and to achieve the satisfaction of stakeholders, management should to join forces and capabilities, and create maintained and functional quality management system towards continuous improvement.

Process of continuous improvement is to be used as a tool for improving internal efficiency and effectiveness. Methods for verifying the functionality of the quality management system are one of the possible and potential methods to ensure functionality of the Quality Management System. Their level of use in practice depends on the companies and their free decisions for the application of these methods. Companies that implement these methods, demonstrate improvement in functional quality management system. If the system in the company works efficiently, effectively and with a focus on continuous improvement, this will be reflected in the final product that will meet customer requirements. A satisfied customer is the aim of every company. The relationship between quality management system and performance of the company is an important factor in deciding about a commitment to quality management approach. Several studies have confirmed the existence of a positive and significant relationship between motivation to get a certificate and influence of quality management system for company performance.

Decision of company to obtain certification depends on various internal and external factors related to the Company. Depending on these factors, the impact of the quality management system for company performance differs.

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References

[1] Bititci, U., Ackermann, F., Ates, A., Davies, J.D., Garengo, P., Gibb, S., Firat, S.U. (2011). Managerial processes: Business process that sustain performance. International Journal of Operation and Production Management, 31(8), 851–887.

[2] Cienciala, J. (2011). Procesně řízená organizace. Praha: Professional Publishing, 2011. s. 204. ISBN 978-80-7431-044-7.

[3] Denyer, D., & Tranfield, D. (2008). Producing a systematic review. In D. Buchanan (Ed.), The sage handbook of organizational research methods. London: Sage.

[4] Garengo, P., Biazzo, S., & Bititci, U.S. (2005). Performance measurement systems in SMEs: A review for a research agenda. International Journal of Management Reviews, 7(1), 25–47.

[5] Nenadál, J. (2004). Měření v systémech managementu jakosti, 2. doplnkvé vydání, Management Press, Praha 2004, 335 s, ISBN 80-7261-110-0.

[6] Landon, T. (2003). 13 krokú k certifikaci ISO 9001:2000. Moderní řízení 7/2003. s. 29-32.

[7] Ryšánek, P. (2003). Evropský pohled na kvalitu - cesta k excelenci. Moderní řízení 11/2003. s. 35-37.

[8] Slivková, A. (2011). Prístupy k hodnoteniu finančnej výkonnosti priemyselných podnikov. In SEMAFOR 2011 : zborník príspevkov : medzinárodná vedecká konferencia : Košice, 6.-7.október 2011 [elektronický zdroj]. - Bratislava : Vydavateľstvo EKONÓM, 2011. ISBN 978-

80-225-3264-8, s. 1-8. VEGA 1/0641/10.

[9] STN EN ISO 9001:2008 Systém manažérstva kvality. Požiadavky. SÚTN Bratislava 2009.

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NET PROMOTER SCORE WITHIN PUBLIC ADMINISTRATION – FEASIBILITY OF APPLICATION

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Abstract: Our article is focused on the NPS approach in public administration. According to relevant authors prove the promoters significantly impact the growth of the private sector company. The public administration cannot focus on the growth but rather on the quality of the service. We believe that by the proper NPS model implemented in the public sector we may increase the quality of the service provided by various authorities and then to specify some relevant quality expectations and standards of this sector. In Velké Kapušany Town Office we have realized a NPS survey with the consecutive detailed evaluation of it.

Keywords: net promoter score (NPS), promoters, customer satisfaction, loyalty

1. Net promoter score / net promoter system

The net promoter score (NPS) may be defined as the most progressive methodology of the observation of the loyalty [1]. Within the private sphere the NPS phenomenon – net promoter score and the net promoter system - are the meaningful indicators of the clients overall satisfaction with the products or with the service of the respective company or the corporation. As in [1].initially the NPS represented an important task implemented in the observation of the companies and their client mutual relations. This enabled to express what lot of companies intuitively understood, that within their client basis exist the persons contributing the growth of the company by purchasing behaviour their both and their recommendations (the promoters); and another person's preventing the growth of the company by their negative recommendations (detractors) and finally the persons representing the unrealized opportunity (passive promoters) [2]. The point is that by giving a simple question intending to the clients loyalty towards the company we may find the substantial evidence that the NPS correlates with the business growth. In present the NPS represents more than only the metrics. In generally we may establish that the application of the NPS consists of the consecutive steps for the purpose of enhancing and improving the respective sub processes creating the total process terminated by the output in the form of the product or the service. We assume that this methodology is feasible within the public administration too. Particularly the task of NPS is to find the reasons of the client dissatisfaction and then through the specific measures to contribute the remedy, the improvement and the consistent growth. Thus the NPS is not a terminal station and it is an indicator enabling to initiate the measures tending to the improvement of the internal processes openly influencing the overall future clients' satisfaction. It is feasible based on gained both the respective figures and the clients? feedback. Based on their research Owen a Brooks show an existing direct relation between the NPS score growth and the growth of the company incomes [1]. Along with it they mention the fact that the higher percentage of the

detractors is resulting in the decrease of the company growth and on the other hand the absence of the detractors drives the positive growth [1]. Reichheld the NPS pioneer suggests the fact that the enthusiastic clients ready to recommend the company to the people known to them are the key persons for further company growth in many companies and within majority of the sectors [2]. In contrary he observes that he does not expect the relative growth in the background characterized as the monopoly, where the public administration may be included and where the clients have only a minimal opportunity to choice the answer "I should recommend". The situation of the public administration is different. The public administration does not produce the specific commodities but it provides the service. In particular it is important to make a qualitative analysis of the provided service. The way of providing the service is not settled by the legislation. The legislation arranges only the fact that the service has to be provided or that it may be provided. The basic difference in comparison to the private sphere is that the citizen, in most cases, may not choose the provider of the service optionally. The citizen is entirely dependent on the authorized body. As the citizen/client has mostly no alternative option it may be named as quasi "market monopoly position of the public administration body,.. In contrary to the private sphere the public administration authorities are not competitive. The public administration authorities primarily are not tending either to the generation of the profit or to the economic growth. Consequently the practice does not show that the clients dissatisfied with one office shall turn to the office with better reference or to another one with what the clients' previous experience was positive.

2. Applied NPS methodology

The NPS is calculated as the difference between the net promoters and the critics (detractors) of the existing particular company. The promoters and the detractors ratio was found on the basis of the responders representative sample answers to the question "How likely would you recommend the company products and the service to your friends and known persons?" The answers were measured through the scale in the range from 0 (I absolutely do not recommend) up to 10 (I do highly recommend). The responders with the answers 9 and 10 were specified as the net promoters. The responders answering in the range from 0 to 6 were specified as the critics. The responders answering between 7 and 8 were specified as neutral or the passive promoters. Then the overall NPS was calculated through the pattern: NPS = net promoters (%) – critics (%). The range of the NPS values may be between plus 100 and minus 100.

3. NPS within the Public Administration – the Pilot NPS Project at the Town Office Veľké Kapušany

Our Pilot NPS project within the public administration was focused on the Town Office Vel'ké Kapušany. Together with Dr. Gyimesi the head of the Town Office Vel'ké Kapušany we elaborated the questionnaire and then the employees, after finishing their work with client, submitted the questionnaire to the client for the completion. The questionnaire was anonymous and besides other 9 questions it included also the ultimate NPS question utilized at the private sphere questioning: "To what extent would you recommend this office products and service to your friends and well known persons?" The questionnaire consists of 10 questions, 8 of them are of the scale from 1 to 10 and two questions are of yes/no types of answers. In spite of the fact that within the public administration the clients have mostly no option to choose the office arranging their matters we believe that the clients' answers are of sufficient value for consideration of the extent of the clients' satisfaction regarding the public administration authority service. Along with the clients' satisfaction with the service of the authority we were establishing also the opinions of the Hungarian nationality citizens regarding their satisfaction with application of the Hungarian language at Vel'ké Kapušany Town Office and how many of them are demanding to process their official business in the language of this national minority. This analysis is essential also in relation to legitimacy of stronger striving of Hungarian political representation regarding the strengthening of the national minority member language rights. In close future we want to realize other NPS inquiries at chosen authorities and to compare it. Within the public administration the sense of NPS is to gain the client information repeatedly, to make the analysis of it and systematically eliminate the addressed failings and gaps.

3.1. NPS within the public administration – results of NPS pilot project at Veľké Kapušany Town Office

At Veľké Kapušany Town Office was realized the NPS inquiry from June to September 2014. The sample consists of 105 responders the clients of the Town Office who were asked to complete the anonymous questionnaire of 10 questions right after the termination of the communication with the officer. All completed questionnaires were scanned and filled with the registry. Regarding the answer to the ultimate question "How likely would you recommend the products and the service of the office to your friends and well known persons?" 55 responders i.e. 52,3% indicated the score 9 and 10 (the range was from 1 to 10) where 1 means I should absolutely do not recommend and 10 means I should strongly recommend. These responders were ranked as the net promoters. Other 18 responders i.e. 17,1% answered this question in the range from 1 to 6. These responders were ranked as the detractors. And 32 of responders i.e. 30,5% answered this question in the range from 7 to 8 whereby they were included to the group of either neutral or passive promoters. Veľké Kapušany Town Office overall NPS score = 35.2%.



Figure 1: How likely would you recommend this office service to your family, relatives and friends?

Table 1 NPS score of the Town office Veľké Kapušany

NPS=35,3%	Town Office Veľké Kapušany	July-September 2014 N=105
net pro	52,3%	
passive p	30,5%	
detra	17,1%	

The average age of the responders answering the questionnaire was 40 years with 54% of prevailing females and 46% of men. The high school education was filled by 70% of responders, 60% of the responders were the inhabitants of Vel'ké Kapušany, and 55% of the total number were the responders of the Hungarian nationality. Relative many responders were including the group of 16% of the unemployed with average age of 38,6 years and the pensioners with 10,5%. The active working citizens were represented by 12% of public administration employees. The question accentuated by us was the question No.9,, How many times did you visit this office till you arrange your matter?" Only 33% of the responders said that they were able to arrange their mater successfully for the first time. The responders counting 37% needed two visits to arrange their matters and almost 30% of the responders needed 3 and more contacts to arrange their matters.



■1 ■2 ■3 ■3-5 ■5+

Figure 2: How many times did you visit this office until you arranged your mater?

Under the question No.3 we see the deficiencies resulting in our recommendation regarding the intensive work of the Town Office. We believe that the marked reduction of the numbers of the contacts resp. the less personal visits of the client needed for arrangement of the respective mater shall contribute the higher client satisfaction. It should be applicable the less contacts needed for arranging the respective matter the higher is the client satisfaction with the service provided by the office. The aim should be the arrangement of the matter for the first time. For this it is necessary to adjust the officers' way of work and to verify the most often reasons of the repeated contacts regarding the same matter and to minimize these contacts through the adequate and targeted measures.

Table 2 Key differences/similarities between public
administration and private sector in terms of NPS
approach

Key differences /similarities							
Private sector	Public administration						
Growth	The growth cannot be						
	measured						
Competition	Very limited competition						
Process approach	Lack of process approach						
Effectiveness	Effectiveness						
Loyalty	Very limited possibility to						
	measure loyalty						
Customer satisfaction	Customer satisfaction						
Inclusion of employees	Inclusion of employees						
Efficiency	Efficiency						
Inclusion of clients	Inclusion of clients						
Quality	Quality						
Managerial functions	Managerial functions						
Innovations	Innovations						

The table 2 shows our opinion regarding the key differences/similarities of both sectors especially we want to expand on the competition piece at this stage. In general we cannot say that there is absolutely zero competition in public sector. We have to consider the specifics of the authorities which are dealing with social service facilities. Let's take the example of the retirement homes. Most frequently the founder is a certain regional authority. This

authority may both to define and to implement its own original end to end concept of a retirement home. Such concept may differ from other concepts in a positive or negative way. As well a retirement home is not bounded with territorial or material scopes. With that said a pensioner can freely decide only based on his own judgment or available references if the particular retirement home satisfies his needs and/or the desired standard of services. On the other hand a building authority cannot implement its own concept neither can acquire citizens from other districts. Pursuant to the provisions of law a building authority has to provide a service within a particular territory and to the specific group of individuals. With that said that the citizen whose permanent residence is the town of Vel'ké Kapušany cannot deal with the building authority in any other town or district. The Building authority in Vel'ké Kapušany is the only appropriate authority. Another good example of possible competition between authorities might be the activity in the sphere of the confirmations. Any town authority issues an authentication of a signature. And the notary may do the same. Here we can see a clear mutual overlap of both the private and the public sectors and the possible competition between the authorities. The authorities can be competitive regarding the provided levels of quality and service, required time spent, distance nevertheless with pricing. In our point of view the lower price and the required time spent are the most competitive advantages in comparison to private notaries. In terms of the process approach the private sector especially the transnational corporations are using the process approach in a very good way making sure they are optimizing their processes to meet the customer demands. In the public administration we rarely see this approach in the authorities operations and customer facing roles or departments. On the authority's side the lack of process understanding and the non-ability properly and simple to explain to the client what needs to be done results in the multiple visits. We believe that the multiple visits increase the costs; required time spent and is decreasing the effectiveness and quality of the particular authority. Our small NPS pilot in Veľké Kapušany presents the fact that the authorities should focus on reduction of multiple contacts needed to fix the clients demand. If a certain case needs one contact to be arranged and we observe that other same cases need significantly more contacts to be closed then the authority has the process issue which needs to be dealt with. The authority needs to apply the root causing to identify the gap and to work on a solution.

Regarding the terms of the loyalty, in our point of view the client has no other choice then to deal with the appropriate authorities according to law with few examples of exceptions we have described earlier. Moreover we believe that the inclusion of clients can be very helpful to the authorities in public administration. The client's feedback can be and should be used for increasing the quality of the provided service in the way leading to full client's satisfaction. Many clients are willing to share their experience and are pointing out the process gaps, unnecessary bureaucracy, inefficiency, unwillingness and indifferences of employees in solving the client's problems, lack of information sharing, lack and level of communication etc. All the above detailed feedback of the clients may improve the functioning of the particular organization. We believe the innovations are crucial for customer satisfaction either. Transfer of the information between the authorities, online databases with necessary up to date information, particular forms available for downloads, ability to arrange at least some matters online etc. need to become a must have otherwise the New Public management will remain only a theory in Slovak republic.

6. Conclusions

In our work we dealt with the measurement of NPS within the public administration. From the results of the reputable authors' researches we know that there is the correlation between the high number of the net promoters and the growth of the company in the private sphere. Within the public administration we are not able to measure the growth but we may to measure the clients' satisfaction and to focus on improvement and optimization of service provided by the respective authority and then to identify the failures and consequently to eliminate it. We are seeing rather the application of the operative approach. At chosen authorities we have to realize other NPS measurements, to compare them and to make the proper analysis in order to elaborate better generalization of our conclusions.

References

[1] Owen and Brooks, Answering the ultimate question: how net Promoter can transform your business, San Francisco, Yossey- Bass, 2008,

[2] Reichheld, F.F., The one number you need to grow, Harward Business review, pp. 46-54, 2003

TECHNICAL EFFICIENCY OF FOOD PROCESSING FIRMS IN THE CZECH REPUBLIC

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Abstract. The aim of this paper is to estimate technical efficiency of food processing firms in the Czech Republic based on panel data from years 2005–2011 and find out whether crisis started at the year 2008 had significant impact on technical efficiency. Taking into account the fact that firm heterogeneity can influence estimation results, we used "True" fixed and "True" random effects model without as well as with heteroscedasticity. Using stochastic frontier analysis and z-test we verified that all variables (capital, labour, material and dummy-variable for testing differences in efficiency through the crisis period) have statistically significant impact on firms outputs (only TRE model without heteroscedasticity demonstrated insignificance of dummy-variable). Frequency of efficiency distribution showed that 50% of firms have efficiency level about 70%.

Key words: Food processing industry, technical efficiency, Stochastic Frontier Analysis.

1. Introduction

The crisis of the global economy, which occurred during the years 2008–2011, affected almost all sectors of National economy. Czech industry sector has been facing adverse impacts of the crisis. In this paper we analysed productivity of Czech food processing sector through the crisis period. Our main aim is to conduct a comparative analysis among the different periods, i.e. before the crisis (till the year 2008) and after the crisis (after the year 2009) and identify the productive and less productive companies in Czech food processing industry.

An important indicator of productivity of companies is technical efficiency (TE), which is an integral part of overall economic efficiency. Numerous technical and economic efficiency analyses of agriculture exist in Central and Eastern European countries. Moreover, nonparametric approach (Data Envelopment Analysis), as well as stochastic approach (Stochastic Frontier Analysis) have been widely applied. Both approaches assume that firms are not heterogeneous but inefficient, since all inefficiency scores are estimated by assuming a homogeneous technology available to all producers. This suggests that the impact of inefficiency in the agriculture often is overestimated [4]. Considering significant heterogeneity of food processing firms [2], we used "True" fixed and "True" random effects model for efficiency estimation. These models allow to distinguish timeinvariant heterogeneity from time-varying inefficiency.

2. Materials and methods

To study the determinants of TE we used the stochastic production frontier (SPF) methodology developed by Aigner et al. (1977) [1]. The SPF method is based on an econometric (i.e., parametric) specification of a production frontier. Using a generalized production function and cross-sectional data, this method can be depicted as follows:

$$y_i = f(x_{ij}; \beta) * exp(\varepsilon_i)$$
(1)

where y represents output, x is a vector of inputs, β is a vector of unknown parameters, and ε is the error term. The subscripts *i* and *j* denote the firm and inputs, respectively. In this specific formulation, the error term is farm specific and is composed of two independent components, $\varepsilon_i = v_i - u_i$. The first element, v_i is a random variable reflecting noise and other stochastic shocks entering into the definition of the frontier, such as weather, luck, strikes, and so on. This term is assumed to be an independent and identically distributed normal random variable with zero mean and constant variance iid $[N \sim (0, \sigma_v^2)]$

The second component, u_i , captures technical inefficiency relative to the stochastic frontier. The inefficiency term u_i is nonnegative and it is assumed to follow a half-normal distribution [6].

An index for TE can be defined as the ratio of the observed output (y) and maximum feasible output (y^*) :

$$TE_{i} = \frac{y_{i}}{y_{i}^{*}} = \frac{f(x_{ij}; \beta) \cdot exp(v_{i} - u_{i})}{f(x_{ij}; \beta) \cdot exp(v_{i})}$$
$$= exp(-u_{i})$$
(2)

Because y is always $\leq y^*$, the TE index is bounded between 0 and 1; TE achieves its upper bound when a firm is producing the maximum output feasible level (i.e., $y = y^*$), given the input quantities. Jondrow et al. (1982) demonstrated that farm-level TE can be calculated from the error term ε_i as the expected value of $-u_i$ conditional on ε_i , which is given by

$$E[u_i|\varepsilon_i] = \frac{\sigma_u \sigma_v}{\sigma} \left[\frac{f(\varepsilon_i \lambda/\sigma)}{1 - F(\varepsilon_i \lambda/\sigma)} - \frac{\varepsilon_i \lambda}{\sigma} \right]$$
(3)

where $\sigma^2 = \sigma_u^2 + \sigma_v^2$, $\lambda = \sigma_u / \sigma_v$, $f(\cdot)$ represent the standard normal density and $F(\cdot)$ the standard normal cumulative density functions [5]. The maximum likelihood estimation of Eq. [3] provides estimators for the variance

parameters σ_u^2 and σ_v^2 . Thus, the TE measure for each farm is equal to

$$TE_i = exp(-E[u_i|\varepsilon_i])$$
(4)

The questions will be explored by estimating a joint stochastic frontier production function model for the Czech food processing industry.

"True" fixed effects model

In the fixed-effects model is assumed that the inefficiency term is fixed and the correlation with regressors is allowed. The base for most applications of the fixed effects model in the frontier modeling framework is Schmidt and Sickles's (1984) interpretation of the linear regression model [7]. The basic framework is a linear model, which can be estimated consistently by ordinary least squares.

$$y_{it} = \alpha_i + \beta' x_{it} + v_{it} \tag{5}$$

In Schmidt and Sickles model there was no u_{it} and inefficiency was measured by the difference across firms in their individual effects α_i . The authors suggest that the productive efficiency of the firms in the sample be compared on the basis of $\hat{\alpha}_i^* = max_i\hat{\alpha}_i - \hat{\alpha}_i$

Numerous similarly motivated specifications have been proposed for the stochastic frontier model

$$\ln y_{it} = \alpha + \beta' x_{it} + v_{it} - u_i \tag{6}$$

The time invariant element in the model, u_i is intended to capture only the firm specific inefficiency. If time invariant effects such as cross country or cross firms heterogeneity exists, they must also appear in u_i and measured as inefficiency.

"True" fixed effects model, proposed by Green (2005), has the following form:

$$\ln y_{it} = \alpha_i + \beta' x_{it} + v_{it} - u_{it}$$
(7)

where u_{it} has half-normal, truncated normal or exponential distribution [3].

The motivation for the model is that u_{it} represents technical inefficiency whereas α_i represents "heterogeneity" and presumably controls for time-invariant factors that affect the firm's output but that are not regarded as inefficiency.

"True" random effects model

Unlike fixed effects model now we consider the opposite situation, in which the u_i are randomly distributed with constant mean and variance, but are assumed to be uncorrelated with the regressors and the v_{it} . The random effects specification is likewise motivated by the familiar linear model. It is assumed that the firm specific inefficiency is the same every year. Thus, the model becomes

$$y_{it} = \alpha + \beta' x_{it} + v_{it} + u_i$$
(8)

Note that the inefficiency term is now time invariant. In this propositions the model absorbs all unmeasured heterogeneity in u_i . The time invariance of the inefficiency component of this model has been a problematic assumption.

Green (2005) argued that the random effects model with the proposed extensions has three significant weaknesses [3]. The first is its implicit assumption that the effects are not correlated with the included variables. The second problem with the random effects is its implicit assumption that the inefficiency is the same in every period. For a long time series data, this is likely to be an undesirable assumption. The third shortcoming of this model is that in this model u_i carries both the inefficiency and, in addition, any time invariant firm specific heterogeneity.

To avoid the former limitations Green (2005) proposed "True" random effects model that is as follows:

$$y_{it} = \alpha + \beta' x_{it} + w_i + v_{it} \pm u_{it}$$
(9)

where w_i is the random firm specific effect and v_{it} and u_{it} are the symmetric and one sided components specified earlier [3].

Data set

The panel data set was collected from the Albertina database. The database contains all registered companies and organisations in the Czech Republic. The analysis uses information from the final accounts of companies whose main activity is food processing in the period from 2005 till 2012. After the cleaning process (removing companies with missing observations and negative values of the variables), the unbalanced panel data set contains 3,921 observations of 844 food processing Czech companies. The data set represents 9 branches of food processing industry, 14 regions of the Czech Republic.

In the analysis were used following variables: Output, Labour, Capital and Material. Output is represented by the total sales of goods, products and services of the food processing company. In order to avoid inflation changes, Output was deflated by the price index of food processing companies according to the branch. (2005=100). The Labour input is used in the form of total personnel costs per company, divided by the average annual regional wage. The Capital variable is represented by the value of tangible assets. Material is total costs of material and energy consumption per company. Capital and Material were deflated by the price index of industrial sector (2005=100).

For estimation software Stata 11.2 was used.

Table 1 Variables used in production analysis

Variable	Mean	Std. Dev	Min	Max
Output (Y _{it})	256299.2	602843.4	1.666667	6864814
Capital (K _{it})	92485.79	278904.4	4.374453	4245282
Labour (L _{it})	21340.15	47218.78	8.727273	617507.5
Material (M _{it})	172543.4	396923.9	2.835539	4607265

Source: own processing

3. Empirical application

 Table 2 Significance of main branches in the dataset (as a percent of total industry output)

	of ions	Share of branch in industry output ¹									
Year	Number observati	CA 101	CA 103	CA 105	CA 106	CA 107	CA 109				
2005	453	23.3	2.7	25.8	4.8	8.9	5.4				
2006	501	20.3	3.0	23.7	4.4	13.7	4.6				
2007	573	24.1	2.6	24.8	3.6	12.1	6.5				
2008	609	23.5	2.4	23.2	3.7	12.7	6.7				
2009	620	23.2	2.7	21.1	3.4	11.4	11.8				
2010	609	21.5	2.7	20.6	3.4	13.5	11.9				
2011	524	23.6	2.4	19.4	3.0	11.2	13.8				
2012	31	14.7	0.07	2.0	3.7	8.9	0.9				

Source: own processing

Analysing data in the table 2 we can conclude that year 2012 significantly differs from other years. In order to get a consistent estimations of efficiency this year will not be used in further study.

The most significant share in total output belongs to Preserved meat and meat products (22.8% on average) and Dairy products (22.7% on average). The share of latter is decreasing over the years. The decline might have been caused by the exit of large firms from the branch or the database. Bakery and farinaceous sphere produces on average 11.9% of total industry output. The share of other branches is not very significant. Prepared animal feeds share increased almost twice from the year 2009, whereas producing of oils and fats is decreasing.

Parameter Estimates

The empirical analysis is based on the estimation of a Cobb-Douglas production function in which both the output and inputs are expressed in logarithmic form. Hence, the estimated coefficients reflect the output elasticities [6].

The empirical stochastic frontier production model that was used is specified as follows:

$$\ln Y_{it} = \beta_1 + \beta_2 \ln K_{it} + \beta_3 \ln L_{it} + \beta_4 \ln M_{it} + v_{it} + u_{it}$$
(9)

To calculate the inefficiency of particular farm the Jondrow et al. (1982) estimator was used.

We assume the inefficiency distribution to be exponential in all models. We introduce dummy variable to find out whether efficiency of food processing firms changed through the crisis period.

The maximum likelihood Estimates (MLE) of the stochastic production parameters for the crops (in aggregate) are presented in Table 3.

Table 3 Estimated stochastic frontier

	"True" fi: mo	xed effects del	"True" rand	dom effects model
	Homosce- dasticity	heterosce dasticity	Homosce- dasticity	Heterosce- dasticity
		Frontie	r	
$\beta_k (\ln K_{it})$	0.277***	0.081***	0.060***	0.066***
$\beta_L(\ln L_{it})$	0.187***	0.430***	0.246***	0.332***
$\beta_M (\ln M_{it})$	2.323***	2.263***	0.491***	0.462***
dummy	-0.139***	-0.250***	-0.001	0.013***
Intercept			5.892***	6.170***
	Iı	nformation in	dicators	
Log- likelihood	-3380.51	-3328.91	-1806.15	-1673.01
σ_u	0.898***	0.887 (E(σ_u))	0.311***	0.321 (Ε(<i>σ</i> _u))
σ_v	1.63e-06	4.49e-07 (E(σ_v))	0.019***	$\frac{0.029}{(E(\sigma_v))}$
λ	551082.9 ***	1.97e+6	16.707** *	11.200
Prob x^2	0.000	.000	.000	.000

Source: own processing; ***, **, * denotes significance at the 1%, 5%, and 10% level, respectively

Model 1: TFE

Estimated parameters are significant under z-test. Signs of the coefficients are found to be consistent with economic theory. In Cobb-Douglas model these coefficients denotes the variation or possible percentage change in aggregate output as a result of one percent change in the input, that is production elasticity. All production elasticities are positive; the model shows high elasticity of material. The parameter λ is the relation between the variance of u_{it} and v_{it} . Thus, the parameter indicates the significance of TE in the residual variation. A value larger than one suggests that variation in u_{it} prevails the variation in the random component v_{it} . Dummy variable is significant at the 5% significance level in the case of TFE model, the sign is negative, what supposes the higher output at the period after the year 2008.

Model 2: TFE with heteroscedasticity.

The parameters of the model are statistically significant at the 5% level, the slopes are positive. Results of estimation confirm the existence of heteroscedasticity in inefficiency term, but negated it in the error term.

Model 3: TRE.

The criteria of theoretical consistency, i.e., the assumptions regarding slope of the production function, are fulfilled in the case of TRE model. Elasticity of the production factor capital is very low. Dummy variable is insignificant in TRE model, what deny the considerable change of efficiency through the crisis period.

Model 4: TRE with heteroscedasticity.

Signs of the coefficients, as well as the numerical results obtained, were found to be robust under the model. The parameter λ indicates the significance of TE in the residual variation; the amount 11.2 suggests that efficiency differences among firms are an important reason for variations in production. Results of estimation proved existence of heteroscedasticity in the error and inefficiency term.

¹ CA 101- Preserved met and milk products, CA 103- Processed and preserved fruit and vegetables, CA 105- Dairy products, CA 106- Grain mill products, starches and starch products, CA 107- Bakery and farinaceous products, CA 109- Prepared animal feeds

	TFE		TRE	
	homosce dasticity	heterosce dasticity	homosce dasticity	heterosce dasticity
	Techn	ical efficienc	у	
Mean	0.641	0.646	0.695	.702
Minimum	7.78e-12	5.47e-12	0	0
Maximum	0.999	1	0.985	.971
Standard deviation	0.308	.308	0.224	.228
	Returns	s to scale (RT	'S)	
Value	2.787	2.773	0.796	0.860

Table 4 Technical efficiency and returns to scale

Source: own processing

The highest efficiency exhibits TRE model with heteroscedasticity, the lowest – TFE without heteroscedasticity. The difference is 9.6%. The frequency distributions of efficiency estimates obtained from the stochastic frontier model shows that the 50% of the firm operated below efficiency level of 69.1% (TFE), 70.5% (TFE with heteroscedasticity), 74.6% (TRE), 77.6% (TRE with heteroscedasticity). Returns to scale obtained under fixed and random effects model exhibits different result. TFE model calculated increasing RTS, whereas TRE model – diminishing RTS.

4. Conclusion

The aim of the paper was estimation of technical efficiency of food processing Czech firms through the crisis period. The study, based on SFA and estimation of the TFE and TRE model, indicated heteroscedasticity in the inefficiency term (TFE), and the inefficiency and error term (TRE).

Estimation showed that, according to TFE model, differences in efficiency before and after 2008 year exist, moreover firm before the crisis period are less efficient. TRE without heteroscedasticity, in opposite, presented insignificance of efficiency difference between two analysing periods.

The efficiency level of all firms in the sample was on average 67%. This result implies that farmers were able to obtain 67% potential output from a given combination of production inputs. TRE model exhibits higher level of efficiency than TFE model. Models with heteroscedasticity shows lower inefficiency level than their homoscedastic analogs. The average level of TE in the sample suggests that, from a technical standpoint, the opportunity exists to expand production output using the current level of inputs and the technologies already available in the firm. These results suggest that food processing companies can improve their productivity and efficiency if they take advantage of more efficient firm practices.

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References

[1] Aigner, D., Lovell, C.A., Knox, Schmidt, P. Formulation and estimation of stochastic frontier production function models. *Journal of Econometrics*, 1977, Vol. 6, p. 21-37

[2] Čechura, L. Zdroje a limity růstu agrárního sektoru. Praha: Wolters Kluwer, 2009, 296p., ISBN 978-80-7357-493-2

[3] Green, W. Fixed and Random Effects in Stochastic Frontier Models. *Journal of Productivity Analysis*, Vol.23, p.7–32, 2005

[4] Hockmann H., Pieniadz A. Farm Heterogeneity and Efficiency in Polish Agriculture: A Stochastic Frontier Analysis. 12th Congress of the European Association of Agricultural Economists – EAAE 2008. [Online]. Available at:

http://ageconsearch.umn.edu/bitstream/44278/2/496.pdf

[5] Jondrow, J., Lovell, C. A. K, Materov, I. S., Schmidt,
P. On the Estimation of Technical Inefficiency in the Stochastic Frontier Production Function Model. *Journal of Econometrics*, 1982, Vol.19, p. 233-238, ISSN 0304-4076
[6] Kumbhakar, S.C., Lovell, C.A.K. *Stochastic Frontier Analysis*. 1 st ed. Cambridge University Press, Cambridge, 2000

[7] Schmidt, P., Sickles, R. Production frontiers and panel data. *Journal of Business&Economic Statistics*, Vol.2, Issue 4 (Oct., 1984), p.367-374

GOVERNMENT GROSS DEBT AND UNEMPLOYMENT IN SELECTED EUROPEAN COUNTRIES

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Abstract: Countries face the problem of deepening public debt and trying to find solutions that would be an appropriate tool of fiscal sustainability. This article deals with the analysis of government gross debt and unemployment rate in the period of 2004 - 2013. For better understanding, the unemployment rate was divided into total rate and rate of young people less than 25 years old. Government gross debt was analysed as % of GDP to minimize the differences between countries. At the end, European countries were allocated into 3 groups according to obtained results in analysis.

Keywords: government gross debt, unemployment.

1. Introduction

The global economic and financial crisis has affected all EU countries, and despite a slight recovery of the economy of some countries crisis continues leaving visible consequences, especially in the area of public finance. Countries face the problem of deepening public debt and trying to find solutions that would be an appropriate tool of fiscal sustainability across the EU. [4] The mission of public finance is therefore to ensure the functioning of the public sector and thus contribute to achievement of stability and efficiency of the national economy. [5]

"Budget deficits and debt accumulation can serve two purposes: they provide a means of redistributing income over time and across generations; and they serve as a means of minimizing the deadweight losses of taxation associated with the provision of public goods and services." [1]

Public debt is associated with long-term fiscal imbalances, and is considered to be very questionable. Public debt is closely linked with budget deficits, because the reason of the public debt may be, inter alia, the transformation of the budget deficit to public debt. This means that the government solves the budget deficit in the form of debt financing, i.e. financing based on the sales of bonds, which are bought by domestic or foreign entities.

2. Aims and methodology

The aim of this article is to identify the European countries, which may have or have had financial problems. To assess the level of individual economies and their potential difficulties we can use many approaches containing various indicators. In this article we have chosen the following indicators: gross government debt and unemployment to identify countries with some difficulties. For more detailed analysis, the unemployment rate was monitored at the level of total and population up to 25 years.

Given debt to GDP ratio is also referred to as debt ratio and can be expressed as the ratio of public debt at the time as follows:

$$dD / dY = (\partial D / \partial t) / Y - (D \partial Y / \partial t) / Y^{2} = (\partial D / \partial t) / Y - [(\partial Y / \partial t) / Y]D / Y$$

The above equation shows that the debt to GDP ratio changes over time when GDP is declining or debt is increasing. Consequences of the GDP itself depend on the proportion of D and Y. If the debt to GDP ratio (D / Y) is high, then during the recession, when there is the decline in GDP this could lead to a significant increase in the debt ratio. [5]

The unemployment rate is expressed as a percentage and is calculated as follows:

Unemployment rate =
$$\frac{\text{unemployed workers}}{\text{total labour force}} *100\%$$

As defined by the ILO (Onternational Labour Organization), "unemployed workers" are those who are currently not working but are willing and able to work for pay, currently available to work, and have actively searched for work. [3]

We have found out, that unemployment rate in group less than 25 years has higher explanatory value than total unemployment rate. It means that if young people have difficulties in searching suitable employment, in the future the country's economy may have problems for several reasons. For example such young people often leave the country to work in another one and home country is losing population of working age, and there is an unequal distribution of labour by age structure. Furthermore, young people without work lose their working habits and begin to rely on the social system of the country, and thus actively do not participate on the GDP creation, but only rely on social support system. Thus, in countries with high rates of unemployment among people under 25 years there can be expected slowdown in GDP growth and thereby increasing government gross debt in the long term.

Monitored indicators have been divided into three groups, where values falling in the first group were given the best indicator, and values falling within the third group were above the all generally accepted standards. Below is the exact definition of each group of our examined indicators. Total unemployment:

- up to 5 % 1 group
- 5-20 % 2 group
- over 20 % 3 group

Unemployment less than 25 years:

- up to 5 % 1 group
- 5-20 % 2 group
- over 20 % 3 group
- Government gross debt as % of GDP:
- up to 60 % 1 group
- 60 100 % 2 group
- over 100 % 3 group

We then evaluated individual indicators for the analyzed countries and we have included them in one of three defined groups. As the most vulnerable countries were identified those which, fell within the third group in the indicators of gross government debt as % of GDP and unemployment rate for less than 25 years.

Countries with possible problems in the future were those that were in the 3rd group for indicator of unemployment rate for less than 25 years and in the 2nd group in indicator for gross government debt as % of GDP.

Data from Eurostat were the basis for our analysis. Development of gross government debt as % of GDP and unemployment rate were analysed for the period of 2004-2013.

3. Discussion

We have analysed the unemployment rate in 2013 in total and for inhabitants with less than 25 years. The unemployment rate of young people reached higher values than unemployment rate in total. It is caused by fact, that young people do not have any work experience and therefore are for employers not so interesting. On the other hand, many young people do not have working habits. Totally we can say, that unemployment rate is in all analysed countries higher for young people.



Graph 1 Unemployment rate (%) in 2013

The values of government gross debt as % of GDP in 2013 is shown in the graph 2. Most countries were ranged between 20-100 %.



Graph 2 Government gross debt in 2013 as % of GDP

On the graph 3 we can see, that countries from the 3rd group have had higher government gross debt as % of GDP than countries from the 2nd group in the period of 2004-2013. We find out very specific phenomenon, that Ireland had recorded the values about 30 % for the years 2004 - 2008, and during 1 year, the values jumped over 60 % and continued to grow over 120 % in 2013. This situation in Ireland is mainly due to banks. "Irish banks have a particular debt in relation to foreign countries - to the European Central Bank (ECB), European commercial banks, etc." [2] This development results from the large primary deficits, rising interest costs and decreasing the nominal value of GDP, but also from measures to rescue banks. [5]



Graph 3 Development of government gross debt as % of GDP in countries from 3rd and 2nd group

Note: Countries in the 3rd group are in red colours and countries from the 2nd group are in blue colours.

According to the conditions set out in the methodology, we divided analysed countries into three groups for each of the examined indicators. The results are presented in Table 1 at the end of this paper.

Highlighted in red are those countries that had the unemployment rate in the population up to 25 years more than 20 %, while government gross debt as % of GDP was higher than 100%. Thus, in either case, they were placed in the third group. These countries are Ireland, Greece, Italy, Cyprus, Portugal and Belgium. Usually it is a country which has had significant financial problems. Belgium is surprisingly in this group in the year 2013, although its values achieved were only slightly lower than the current threshold. This is apparent from a longer period when Belgium had high national debt and in the following years it was decreased. Ireland, Cyprus and Portugal belong to blue highlighted countries few years ago. Their economic situation get worse, so they belong to red highlighted countries now.

Blue highlighted countries are those that have government gross debt as % of GDP at the level of 60 to 100 %, but have high unemployment (over 20 %) of the population under 25, so there is a presumption that their economic situation will deteriorate and government gross debt as % of GDP will increase and will exceed the level of 100 %. These include Spain, Croatia, Hungary, Slovenia, France and the UK.

4. Conclusions

Public debt in most Euro area countries is unproportionally high and in the near future, we cannot expect its significant reduction. The current crisis in public finance continues to deepen, and therefore it is considered necessary to devote more attention to the determinants of public debt. The fact that the absolute expression of public debt does not inform enough about the fiscal imbalance in the country, it is especially important to examine the rate of public debt to GDP, known as the debt ratio.

According to our division of analysed countries into three groups, we identify countries, which may have or have had big financial problems (from the 3rd group). Countries from the blue "box" may expect financial problems in the near future, if they do not change anything in their economic policy.

References

[1] Alesina, A., Tabellini, G. A positive theory of fiscal deficits and government debt. *The Review of Economic Studies*, 1990, *57*(3), pp. 403-414. DOI: 10.2307/2298021, WOS:A1990DQ64800005 .

[2] Fifek, E. [online] Súčasný vývoj európskej dlhovej krízy. In: *Vedecké state Obchodnej fakulty*, 2010. Available at:

http://of.euba.sk/konfVeda2012/Prispevky/Fifek_Edmund. pdf

[3] International Labour Organization, Available at:

http://www.ilo.org/global/lang--en/index.htm

[4] Kotulič, R. Proces začlenenia Slovenska do Európskej únie očami vybraných makroekonomických teórií v čase prebiehajúcej hospodárskej krízy. In: *Zborník vedeckých prác katedry ekonómie a ekonomiky ANNO 2010* [5] Mihoková, L. [online] Faktory ovplyvňujúce relatívnu váhu verejného dlhu. In: *Mladí vedci 2011*, Košice. Available at:

http://www3.ekf.tuke.sk/mladivedci2011/herlany_zbornik 2011/mihokova_lucia.pdf

	20	004	20	005	20	06	20)07	20)08	20	09	20)10	20	11	20)12	20	013
	U25	Debt																		
EU 27	2	2	2	2	2	2	2	1	2	2	3	2	3	2	3	2	3	2	3	2
Belgium	3	2	3	2	3	2	2	2	2	2	3	2	3	2	2	2	2	3	3	3
Bulgaria	3	1	3	1	2	1	2	1	2	1	2	1	3	1	3	1	3	1	3	1
Czech Rep.	3	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
Denmark	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
Germany	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Estonia	3	1	2	1	2	1	2	1	2	1	3	1	3	1	3	1	3	1	2	1
Ireland	2	1	2	1	2	1	2	1	2	1	3	2	3	2	3	3	3	3	3	3
Greece	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Spain	3	1	2	1	2	1	2	1	3	1	3	1	3	2	3	2	3	2	3	2
France	3	2	3	2	3	2	2	2	2	2	3	2	3	2	3	2	3	2	3	2
Croatia	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	1	3	2
Italy	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Cyprus	2	2	2	2	2	2	2	1	2	1	2	1	2	2	3	2	3	2	3	3
Latvia	2	1	2	1	2	1	2	1	2	1	3	1	3	1	3	1	3	1	3	1
Lithuania	3	1	2	1	2	1	2	1	2	1	2	1	3	1	3	1	3	1	3	1
Luxembourg	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
Hungary	2	1	2	2	2	2	2	2	2	2	3	2	3	2	3	2	3	2	3	2
Malta	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Netherlands	2	1	2	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	2	2
Austria	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Poland	3	1	3	1	3	1	3	1	2	1	3	1	3	1	3	1	3	1	3	1
Portugal	2	2	2	2	3	2	3	2	3	2	3	2	3	2	3	3	3	3	3	3
Romania	3	1	2	1	3	1	2	1	2	1	2	1	3	1	3	1	3	1	3	1
Slovenia	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	3	1	3	2
Slovakia	3	1	3	1	3	1	3	1	2	1	3	1	3	1	3	1	3	1	3	1
Finland	3	1	3	1	2	1	2	1	2	1	3	1	3	1	3	1	2	1	2	1
Sweden	3	1	3	1	3	1	2	1	3	1	3	1	3	1	3	1	3	1	3	1
UK	2	1	2	1	2	1	2	1	2	1	2	2	2	2	3	2	3	2	3	2
Norway	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1

Table 1: Assignment of countries into one of three groups according to development of government gross debt and unemployment rate less than 25 years

INTRODUCTION TO SPECIAL ECONOMIC ZONES

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Abstract: The globalisation trend has brought the huge reforms into the many world economies for the last decades of the twentieth century. The special economic zone introduces the concept for new understanding of the economic policy. This phenomenon has caused several debates not only among economists in the recent period. The disputes related to the special economic zones topic comprises also the legal issues besides the common economic questions. There are many countries with the transitive type of their economic experiments with the market institutions. Later after their application into the practice, they became the areas with the relaxed administrative requirements and the legal necessities and mainly with the specific tax laws including the other special schemes. Their primary aim was a promotion of economic development. The concept of special economic zoning is diseased by the modern system errors nowadays. That is why this field of the economic research should be treated by further exploration in order to prepare it for exceptional practical usage.

Keywords: special economic zone, reform, trade zone, globalisation

1. Introduction

Globalisation puts the incentives on the change of the governmental structures, the economic regimes and the public policy in general. In our contribution, we will discuss some of the selected specific aspects related to the classic instance, which is obviously associated with the trend of globalisation and the large scale reforms that have taken place in the world economy for the last decades of the twentieth century.

While discussing the institutional change, there is one fact that should be noticed and that is the large volume of scientific papers has been already written on the different dimensions of an above mentioned phenomenon. On the other hand, this has ensured other economists to prevent vivid discussions about the possible future of the economic policies.

2. Special Economic Zone

Many classical instances are still viable in the different contexts, such as current practice of the particular economic policy and the decisions of the various countries to demonstrate this matter in the legislative outcomes or the intended plans. Although the economic policy concept to be discussed in this paper has long tradition, it is still the vital concept. This is very modern illustration, which shows the way how some of the more traditional concepts are restored and repeatedly established in the new environments, the innovative conditions and the modern recent period. Such procedure can be considered as uncommon but in this state it has been suitable optimum. The conventional instance, which has been mentioned and also is going to be frequently mentioned in this discussion paper is a phenomenon, economic and legal, while still truly global, which is the policy concept of the special economic zones.

2.1 Special Economic Zone as Economic Policy Component

The issues related to the special economic zones topic, involving legal as well as economic questions, belong to one of the most debated subject in the usage of an economic policy practice. The majority of the countries with the transitive type of their economy belong to this discussion.

The mostly proliferated perception of the special economic zones, the areas with the relaxed administrative requirements and the legal necessities, as well as the tax laws or the other special schemes for a promotion of economic development, is associated to historical picture of the economic experiments with the market institutions, which were transferred to much larger scale then. There is to note that long historical genealogy of these concepts exists. Even though these reforms brought the results, these consequences were not the same in every case. There are a lot of cases described in the scientific literature, which dispute the special economic zone as an instrument of the economic policy in the various contexts.

A phenomenon of the special economic zones is truly global, as it has been already stated. These zones are located around the world and many countries adopted such kind of the policy model – the model comprising the special economic zone as one of the features what can be exaggeratedly said.

2.1 Regulation in Special Economic Zone

Nevertheless, every single economy and also each one society in general has its own local particulars and the applied regulation may be different in some aspects, while also other extralegal variables step in this process, which have absolutely direct impact on the outcomes of the intended economic policy. This means the current economic policy of the special economic zoning may generate and evidently in practice generates different or mixed results under dissimilar circumstances. It can be functional even globally among all the countries all over the world.

3. Special Economic Zone Models

Secondly, there are different models of the special economic zones, as we will show. These zones attract different investors and are oriented towards the various economic sectors. In any case, there is to remind that it is evident the special economic zones cannot be fully separated from the economic conceptions, the political ideas, the social notions or the other institutional concepts, which are related to the host country.

Every special economic zone is under influences of the environment, which it is being located in. The special economic zones do not exist in some kind of ideal vacuum, but are exposed to the determinants characteristic for every one country, which may hinder or promote their efficiency and the outcomes they can produce.

4. System Errors and Malfunctions

The concept of special economic zoning is eroded partially by contemporary diseases. One of them is a legal ambiguity. This problematic issue with the specific informal institutions in the countries where the special economic zones are established is the one with a corruption.

The concerns related to the legal uncertainty and the associated legal risks, the law enforcement, the lack of infrastructure with sufficient quality, the distinction of workforce, the bureaucracy level and the administrative obstacles vary across all the countries in the world. This is just brief list of the foreign direct investments' determinants – the matter considered to be the core for determining the final foreign direct investments' location. However, the management of the special economic zones and the corrupted practices may hamper further long term economic goals, because of the environmental idiosyncrasies. This is also one of the main reasons why

we cannot expect isolation from the local environment in this topic.

This, of course, did not have the direct influence on the zoning usage. The concept of the special economic zones is employed among the different kinds of the countries, in the various regions and over the diverse continents too.

5. Scientific Overview of Special Economic Zones

There are a lot of mentions of the special economic zoning in the scientific literature. Regarding the number of the existing special economic zones, Tiefenbrun (2013) stated there are three thousand tax free trade zones.

For instance, there are already about 3000 tax free trade zones in the World Tiefenbrun (2013). Farole and Akinci (2011) in their study quote Boyenge (2007) affirming an information that there are three thousand five hundred special economic zones all over one hundred and thirty countries, also quoting the Akinci and Crittle (2008), which states that all the special economic zones make two hundred billion American dollars in global exports and employ directly at least forty million workers.

6. Practical Occurrence of Special Economic Zone

In the previous paragraph we have considered interesting studies illustrating the consequences of the various economic policies on the empirical data, when compared with the intended plans and the desired targets, as well as their social consequences. Ebenstein (2011) in his illuminating study examines the impact of the transnational firm entry into the local labour market on the employment rate, the productivity rate and the wages. Ebenstein aims at discussing the rapid reforms of the People's Republic of China in the eightieth and the ninetieth years of the twentieth century in the context of the special economic zones whilst engaging the data on the companies and their employees, he has come to the successive conclusions:

- these policies increased the foreign direct investments value;
- there was only modest increase in the median of the wage level across all the cities with the assignment to the special economic zone status, while the wage inequality and the rising local prices limited the benefits of the most workers in these cities, although the particular minimum prices did not have to be the lowest ones to perform as the worst point among all the places;
- all the above mentioned factors contributed only into the average labour productivity what was undesired argument from the employers' point of view.

6.1 Results Gained by Applying Suitable Datasets in Particular Region

Ebenstein pointed out another conclusion of his research with commentaries about the study as follows – the evidence of the stated assumptions is presented by the fact that the corporate profits of the involved companies captured most of the increase in the productivity in these areas. Such suppositions brings us to the deduction that while the market structures operate and lead to the rise of the productivity, the datasets providing the data on the special economic zones in these regions show also another different pattern. These characteristics are considered to be the local price increase and it appears mainly at the time of the modest median of the wage increase value. It shows that capturing of the productivity cake outcome was the most significant on the side of the corporate profits of the encompassed companies. This did not result in the optimistic perspective on the improvement of living, although besides the certain circumstances it led to the increased productivity. There is the specific question, which asks whether, how and under what environment conditions, which additional institutional settings or rules may generate better outcomes for the participating citizens, who work in the special economic zones and whether these inhabitants would become the recipients of the larger welfare gains in opposition to the increasing local prices. This issue remains open for further analysis and discussion, because it is the very important question whether and how the citizens participate on the profit cake in the liberalized environment and what are the social outcomes.

The other studies by Wakasugi (2005), Gopalan (2007), Torres (2007), Saine (2013), Jensen and Winiarczyk (2014), Moretti (2014), van Wijnbergen and Willems (2014) describe how the special economic zones' policies crowded out the labour protection laws, limited power of the unions and the minimum wage by establishing the modified labour law regime. It is a very difficult question whether such a system adds attractiveness and to what extent predominantly in the countries, where the price of the labour is significantly lower already.

7. Special Economic Zone Design

Besides all the above mentioned characteristics of the special economic zones, there is to add the fact that the different types of these economic regimes may have the priorities of various kinds to be set on dissimilar levels. It means we can abstract the particular design rules for the special economic zones indifferently from the certain chosen areas.

7.1 Special Economic Zone Classification

The interesting point is the classification of the special economic zones according to the different objectives set as their aims.

One of the first classifications was elaborated as an outcome of the research undertaken by the World Bank. The given study points out the several kinds of the special economic zones which are engaged in fostering environmental goals. There are three main categories of these zones in the assumed research:

- a pollution control zone;
- an ecological industrial park;
- a low carbon green special economic zone.

This division conception is deliberated to be the most advanced and the most sophisticated concept, because of the involvement of the important aspects necessary to be taken into account, such as the efficient usage of resources unavoidably is.

In practice, there are also the different classifications of the diverse sociological and economic targets aimed at the altered purposes; we will discuss them in our further research. Above stated sentences only illustratively show that the economic zones a priori do not have to exclude any of the environmental efforts tried to be reached in our common life.

8. Special Economic Zone Rules

Each special economic zone has its own rules, which can be designed in the different ways. The important point in creating the rulebook is the optimization process. It performs as the significant process and has to take place in order to improve the run of the special economic zones in effect that they should enable selection of the most suitable investors or the projects.

8.1 Special Economic Zone Policy Proposal Regarding General Rules

However, we believe that the above mentioned aspects should be assigned by a dedicated attention to the rules construction process. This is also our further aim to be done - to explore the field of the rules managing the policies and we would like to create a policy proposal for guaranteeing the better governance to potential investors and new businesses from the management of the zones perspective. The possible proposals, which we believe in, would enable transparent working apparently, apart from the special cases of the specific policies. In our opinion such proposal should encompasses the combination of the e-governmental innovations for the special economic zoning, the system for their suitable administration, the particular electronic choice procedures. This would ensure the decrease of the administrative costs, enabling flexibility, better control and guaranteeing the transparency – all of these using the electronic means. There are also other questions we would like to address, but they will be the points of our future research in this field.

9. Conclusion

The special economic zones perform as the very interesting concept of the economic policy. Sometimes it is referred to as the final frontier of the standard common economic policies. It would be very useful to do further scientific research in this field – to explore the imaginable special economic zones' features, to seek out new room for a potential usage of this conception and conceivably after fulfilling all of the necessary conditions to boldly put it into practice if this step would appear as a beneficial rung.

References

[1] Akinci Gokhan and Crittle, James: *Special Economic Zones: Performance, Lessons Learned, and Implication for Zone Development*. World Bank Working Papers, No. 45869. Washington: World Bank. 2008. Retrieved from: http://www-wds.worldbank.org/external/default/W DSContentServer/WDSP/IB/2008/10/07/000334955_2008

1007064814/Rendered/PDF/458690WP0Box331s0April20 0801PUBLIC1.pdf.

[2] Boyenge, Jean-Pierre Singa: *ILO database on export processing zones*. International Labour Organization Working Papers, Vol. 251. Geneva: International Labour Office. 2007. ISBN 978-92-2-119925-0. Retrieved from: http://www.ilo.org/public/libdoc/ilo/2007/107B09_80_eng l.pdf.

[3] Ebenstein, Avraham: Winners and Losers of Multinational Firm Entry Into Developing Countries: Evidence from the Special Economic Zones of the People's Republic of China. Asian Development Review, Vol. 29, No. 1, pp. 29-56. City of Mandaluyong: Asian Development Bank. 2012. ISSN 0116-1105. ISBN 978-92-9092-718-1. Retrieved from: http://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID196294 0_code1478488.pdf?abstractid=1962940&mirid=1.

[4] Farole, Thomas and Akinci, Gokhan: Special Economic Zones – Progress, Emerging Challenges and Future Directions. Washington: World Bank. 2011. ISBN 978-0-8213-8763-4. Retrieved from: https://openknowledge.worldbank.org/bitstream/handle/10 986/2341/638440PUB0Exto00Box0361527B0PUBLIC0.p df.

[5] Gopalan, Kalpana: Special Economic Zones – Economic Panacea or Legal Nightmare? A Discussion on Elements of Public Law in Special Economic Zones. 2007. Retrieved from:

http://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID239339 1_code2142825.pdf?abstractid=2393391&mirid=1.

[6] Jensen, Camilla and Winiarczyk, Marcin: *Special Economic Zones – 20 years later. Case Network Studies & Analyses*, No. 467. Warsaw: Case – Center for Social and Economic Research, 2014. ISBN 9788371785993. Retrieved from: http://www.case-research.eu/sites/d efault/files/publications/S%26A%20467.pdf.

[7] Moretti, Enrico: Are Cities the New Growth Escalator? Policy Research Working Paper, No. 68813. Washington: World Bank. 2014. Retrieved from: http://www-wds.worldbank.org/external/default/WDS

ContentServer/WDSP/IB/2014/05/20/000158349_2014052 0115603/Rendered/PDF/WPS6881.pdf.

[8] Saine, Paul: *Special Economic Zones and the Exploitation Underneath.* Kalinga Institute of Industrial Technology University Law School Working Papers. Bhubaneswar: Kalinga Institute of Industrial Technology University Law School. 2013. Retrieved from: http://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID235944 9_code2068695.pdf?abstractid=2359449&mirid=1.

[9] Tiefenbrun, Susan: *Tax Free Trade Zones of the World and in the United States (Introduction). Thomas Jefferson School of Law Research Paper*, Vol. 2209438. Cheltenham: Edward Elgar Publishing. 2012. Retrieved from: http://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID 2209438_code699328.pdf?abstractid=2209438&mirid=1.

[10] Torres, Raúl A.: *Free Zones and the World Trade Organization Agreement on Subsidies and Countervailing Measures*. Global Trade and Customs Journal, Vol. 2, No. 5, pp. 217-223. Alphen aan den Rijn: Kluwer Law International, 2007. ISSN 1569-755X. Retrieved from:

http://www.freezones.org/GTCJ_03-offprints%20TORRE S.pdf.

[11] van Wijnbergen, Sweder and Willems, Tim: *Learning dynamics and support for economic reforms: why good news can be bad.* Policy Research Working Paper, No. 6973. Washington: World Bank. 2014. Retrieved from: http://www-

wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/ 2014/07/22/000158349_20140722105335/Rendered/PDF/ WPS6973.pdf.

[12] Wakasugi, Ryuhei: *The Effects of Chinese Regional Conditions on the Location Choice of Japanese Affiliates.* Japanese Economic Review, Vol. 56, No. 4, pp. 390-407. Tokyo: Japanese Economic Association, 2005. ISSN 1352-4739. Retrieved from: http://onlinelibrary.wiley.com/d oi/10.1111/j.1468-5876.2005.00337.x/pdf.

ANALYSIS OF COMPANIES OF THE ENERGY SECTOR BASED ON AN EXAMPLE OF THE COMPANIES QUOTED ON THE WARSAW STOCK EXCHANGE IN POLAND AND THEIR FAIR VALUE

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Abstract: this paper examines share price of the companies listed on the WIG-ENERGIA and their fair value between 2005-2014. Data from 2004 to 2014 were collected from the Stooq.pl (Polish portal of shares). Two hypotheses are tested: (1) value of the shares based on the market price; (2) value of the shares as the fair value of shares.

Keywords: power engineering, fair value of shares, company, market value of shares

1. Introduction

The energy security is a strategic issue for every country. For every country, the generation and transmission of electricity is the economic lifeblood, which in addition to the transport system, determines efficient functioning of the economy, and even makes a country independent from other countries and economies.

The economic development of the country is dependent on the access to energy. It is predicted that until 2040, the global economy will be growing at an average rate of 2.8% per year. Taking into account the predicted steady increase of efficiency in the energy production, the increase of the global energy sector will be 1.1% per year. It is anticipated that the importance of conventional sources (energy from coal and oil – the expected increase of 0.4% per year) will be decreasing, with the concurrent increase of participation of the renewable sources (solar, wind and geothermal energy – the increase of 7.4% per year). The development of the renewable energy should contribute to the achievement of its share of approx. 20% in the energy production in 2040.

The WIG-ENERGIA index, presented in Figure 1, shows that from 2011 to 2013, the energy sector companies in Poland showed a lateral trend in their values. However, from the first quarter of 2014, a significant upward trend as well as the achievement of the highest levels, up to the level of 4722 points in the index. The values reported on 26.09.2014 reflect the upward trend and confirm it. However, the market values do not reflect the fair value of the energy sector companies.



Figure 1: WIG-ENERGIA in the period from 01.2010 to 09.2014 [12].

Therefore, it can be assumed that the energy market in Poland is highly dependent on the global economy. Most of the companies quoted on the WIG-ENERGIA index, have a very good financial condition and promise great hope for the rapid and large increases of their values. For that reason, the fair value should be included in the market value, however, the market value differs from it due to some other external factors on the financial market and even speculative factors in the development of the share price of the energy companies quoted on the Warsaw Stock Exchange in Poland [1, 6, 7, 8].

2. Analysis and valuation of the energy sector's companies quoted on the Warsaw Stock Exchange (WSE) in Poland

Shares are the most important group of financial instruments listed on the Warsaw Stock Exchange. In 1991, during the first quotation, the shares were the only financial instrument. At the end of the 90s, the structure of the Warsaw Stock Exchange changed as other financial instruments, including forward contracts, were introduced to turnover. On the first exchange session, shares of 5 companies were listed. In the subsequent years, there was observed an increase in the number of companies and their market value [2, 4, 5].

A share is an instrument combining rights of property and non-proprietary character which result from shareholder's participation in a joint-stock company or a limited jointstock partnership, and the sum of rights and obligations that a shareholder has within the framework of a company or a partnership or a part of a share capital [3, 9, 10, 11].

The following property rights are vital for the valuation of shares:

- right to a dividend (share in a company's profit assigned for division among shareholders),
- right to participation in the division of assets of a company in the case of its liquidation,
- right to subscription of shares of a new stock issue (The Code of Commercial Companies and Partnerships grants the hitherto shareholders a right to taking up of shares on a new sock issue in the case of an increase of a capital by a company) [5, 9, 10, 11].

In the power engineering sector there are four companies, the values of which approach their maximum prices on 29.09.2014, can be recorded, and they are ENERGA, PGE, TAURONPE and ZEPAK. However, other companies do not show their maximum or even fair value, though they can show the net profit and good financial condition, and they are CEZ, INTERAOLT, KOGENERA and PEP. Some companies were overvalued by even 30%. The flagship companies, such as ENERGA, PGE, TAURONPE and ZEPAK, stay ahead with the best results, as shown in Table 1-2.

Table 1: The energy sector companies quoted on the Warsaw Stock Exchange in Poland as of 29.09.2014 (own development based on the data of the Warsaw Stock Exchange).

Name	Average rating	rating
CEZ	3.5/5.0	BB+
ENEA	3.5/5.0	AAA
ENERGA	4.0/5.0	No data
INTERAOLT	4.0/5.0	No data
KOGENERA	3.5/5.0	A-
PEP	4.0/5.0	A-
PGE	3.5/5.0	AA+
TAURONPE	3.5/5.0	BB-
ZEPAK	4.0/5.0	BBB-

Table 2: The energy sector companies quoted on the Warsaw Stock Exchange in Poland as of 29.09.2014 (own development based on the data of the Warsaw Stock Exchange).

Name	Current price PLN	Maximum price PLN from the beginning of the stock exchange quotation
CEZ	100.55	143.80
ENEA	16.30	21.45
ENERGA	23.75	23.89
INTERAOLT	21.49	28.24
KOGENERA	71.79	101.60
PEP	29.00	40.66
PGE	20.51	20.80
TAURONPE	5.25	5.64
ZEPAK	29.90	30.33

Table 3-4 presents the key ratios that show the financial condition of the energy sector companies. Within the nine examined companies, the generated profit per share was reported in nine companies, which should be regarded as a great success of this sector compared to other sectors. It shows that the energy companies prosper properly on the financial market and are able to record higher or lower profits.

Table 3: Technical evaluation of the energy sector
companies quoted on the Warsaw Stock Exchange in
Poland as of 29.09.2014 (own development based on the
data of the Warsaw Stock Exchange).

Name	<i>P/OE</i> (price/ operating earnings)	P/BV (price/ book value)
CEZ	10.19	1.38
ENEA	6.52	0.61
ENERGA	No data	No data
INTERAOLT	No data	No data
KOGENERA	148.15	0.86
PEP	62.64	2.53
PGE	7.08	0.87
TAURONPE	5.04	0.52
ZEPAK	5.05	0.40

The price to the operating earnings shows the losses of the company at the negative value, and this state of affairs was not reported in seven stock exchange quoted companies, and in two companies, the calculation cannot be performed due to the lack of data.

In contrast, analysing P/BV and P/P, it should be noted that both the price to the book value and the price to profit demonstrate that two companies exemplary operate on the market and have a value of more than 1.0, and these are CEZ and PEP. Other companies do not significantly differ from the average values, and these are ENEA, KOGENERA, PGE, TAURONPE and ZEPAK. Only ENERGA and INTERAOLT make it impossible to calculate the P/BV and P/P values due to the lack of data.

Table 4: Technical evaluation of the energy sector companies quoted on the Warsaw Stock Exchange in Poland as of 29.09.2014 (own development based on the data of the Warsaw Stock Exchange).

Name	P/P (price/ profit)	Profit per share
CEZ	1.70	66.702 (CZK)
ENEA	0.77	1.621
ENERGA	No data	1.845
INTERAOLT	No data	0.134
KOGENERA	1.18	5.273
PEP	9.13	0.280
PGE	1.31	2.203
TAURONPE	0.49	0.747
ZEPAK	0.55	4.170

Table 5-6 presents the studies concerning, among others, the net profit, depreciation, EBITDA and assets of the telecommunication sector companies.

According to the obtained values, it is clear that all the companies showed a profit, which was confirmed by the

previous ratios included in Table 3-4. In contrast, five companies have shown a substantial profit which was generated in 2013, and they were CEZ, ENEA, ENERGA, KOGENERA, PGE, TAURONPE, however, in the INTERAOLT and PEP companies, a small profit has been shown.

Table 5: Technical evaluation of the energy sector companies quoted on the Warsaw Stock Exchange in Poland as of 29.09.2014 (own development based on the data of the Warsaw Stock Exchange).

17	Net profit (net loss)	Depreciation in thousands
Name	in thousands PLN	PLN
CEZ	35885000 (CZK)	31507000 (CZK)
ENEA	715368	761759
ENERGA	763972	770635
INTERAOLT	2684	40
KOGENERA	78573	114697
PEP	5958	29125
PGE	4118469	2957313
TAURONPE	1308318	1727069
ZEPAK	216946	355855

Table 6: Technical evaluation of the energy sector companies quoted on the Warsaw Stock Exchange in Poland as of 31.12.2013 (own development based on the data of the Warsaw Stock Exchange).

Name	EBITDA in thousands PLN	Assets in thousands PLN
CEZ	77262000 (CZK)	641136000 (CZK)
ENEA	1658784	16322024
ENERGA	1965469	17084556
INTERAOLT	2499	202607
KOGENERA	214502	1929203
PEP	44921	949244
PGE	8017754	60751308
TAURONPE	3661135	32355570
ZEPAK	714402	6470936

According to the book value per share, it is possible to deduce that some companies are heavily overvalued, and they are ENEA, ENERGA, KOGENERA, PEP, PGE and ZEPAK, and in the case of the CEZ, INTERAOLT and TAURONPE companies, slightly overvalued (Table 7).

Table 7: The energy sector companies quoted on the Warsaw Stock Exchange in Poland as of 31.12.2013 (own development based on the data of the Warsaw Stock Exchange).

Name	Book value per share in PLN
CEZ	479.704 (CZK)
ENEA	25.980
ENERGA	19.404
INTERAOLT	1.665
KOGENERA	79.965
PEP	24.126
PGE	23.202
TAURONPE	9.887
ZEPAK	72.706

However, it is important not to follow this opinion because the values are only the book values, and the calculation of them is purely mathematical and financial. In the case of using the economic attitude and interpretation, it would occur that the companies do not have the fair value (Table 7).

Currently, the value of some companies deviates from the maximum value achieved a few years ago. The only exceptions are ENERGA, PGE, TAURONPE and ZEPAK, which achieved the value close to the maximum one. Other companies have the values of approx. 70% of the maximum one.

However, the fair value, which should be reflected by the share prices of the examined companies, in some cases, differs from the calculated value, which was presented in Table 8. In some companies, it is even approx. 40% of the current values, and they are CEZ, KOGENERA and PEP. In a few cases, the fair value is similar to the current value of the examined companies, and they are ENEA, ENERGA, INTERAOLT, PGE, TAURONPE and ZEPAK.

Table 8: The energy sector companies quoted on the Warsaw Stock Exchange in Poland as of 29.09.2014 (own development based on the data of the Warsaw Stock Exchange).

Fair value	Deviation from the fair value in PLN
142.65	42.10
20.44	4.14
24.56	0.81
23.80	2.31
89.78	17.99
38.96	9.96
20.90	0.39
5.62	0.37
30.12	0.22
	Fair value 142.65 20.44 24.56 23.80 89.78 38.96 20.90 5.62 30.12

3. Conclusions

The share price of the energy sector companies quoted on the Warsaw Stock Exchange in Poland is similar to the fair value because there is a high demand for energy in the world. Though, energy companies demonstrate a profit and the fair value at the same time because the energy market in Poland is developing very well, and even promising bigger development for the future years. In some European Union countries, the development of the energy market is faster because these countries have access, in larger quantities, to the resources, such as oil or natural gas which means that they do not have to import significant amounts outside its borders.

The fair value of all the energy sector companies quoted on the Warsaw Stock Exchange in Poland should be achieved within one year, by 2015, because the energy sector is developing very rapidly.

References

[1] Borowski K., "Wyznaczanie punktów zwrotnych indeksu Wig przy pomocy wybranych metod analizy czasowej". *Bossa.pl*

[2] Copeland T., Koller T., Murrin J. "Wycena: mierzenie i kształtowanie wartości firmy", WIG - Press, Warszawa 1997, pp. 65-69. [3] Frąckowiak W., "Fuzje i przejęcia przedsiębiorstw", PWE 1998, pp. 34-42.

[4] Jajuga K., Jajuga T. *"Inwestycje*", Wydawnictwo Naukowe PWN, Warszawa 1996, pp. 34-57.

[5] Kufel M., "Metody wyceny przedsiębiorstw", Wydawnictwo Park, Bielsko Biała 1992, pp. 78-89.

[6] Parvi R., "Share price of the companies listed on the WIG-UKRAINE and their fair value", Share price of the companies listed on the WIG-UKRAINE and their fair value", Itall Ltd., 2014, pp. 179-185.

[7] Parvi R., "Investment funds and their financial effectiveness", Goce Delchev University Macedonia & THOMSON Ltd. Slovakia, *EDIS* - Publishing Institution of the University of Zilina, 2014, pp. 262-267.

[8] Parvi R., "Share price of companies listed on WIG20 and their fair value". EDIS - Publishing Institution of the University of Zilina EIIC – 3 rd Electronic International Interdisciplinary Conference 2014, pp. 169-177.

[9] Pierce R., "Stocks, Options & Spreads, Infinity Publishing" 2004, pp. 110-115.

[10] Thompson B., "Stock Market Superstar", Insomniac Press 2008, pp. 52-54.

[11] Veale S., "Stocks, Bonds, Options, Futures", Prentice Hall Press 2001, pp. 88-125.

[12] http://stooq.pl/q/?s=wig_energ
CLASH OF LEGAL CULTURES: AN ANALYSIS OF THE COMPLEXITY OF ADOPTING COMMON LAW INSTITUTES IN A CIVIL LAW CULTURE

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Abstract: The article briefly introduces the recent recodification of Czech civil law and the various schools of thought and basic ideas behind the recodification. It then explores the attempts to introduce certain foreign legal aspects, namely instruments of Common Law, into the Civil Law governed legal framework. The article focuses on the rather haphazard methodology of adopting a traditional Common Law instrument – the Trust – into a domestic legal framework with neither precedent nor history to guide its implementation and usage. It suggests alternative methods of adoption or transposition as possible guidelines for future attempts to bridge the gap between two major legal systems.

Keywords: Civil Law, Common Law, Recodification, Trusts, Transposition

1. The Legal Systems

In modern times, three major legal paradigms have evolved, each providing a basic framework in which disparate and oftentimes idiosyncratic elements or instruments developed. The three major current legal systems or cultures are [1]:

- Civil Law, which is the legal system used in states of continental Europe and imported, to varying degrees, to former colonies of continental European empires in the 18th and 19th century;
- Common Law, which evolved in what is now England and Wales and is the legal system, with certain exceptions further discussed below, in the United States, Canada, Australia, New Zealand, the UK and many former Commonwealth nations;
- Sharia, which is Islamic law tightly interwoven with the Muslim faith and is the governing legal system in most Arabic states.

Sharia has always been the "forgotten" cousin in major comparative legal studies and due to the focus of this article on a controversial attempt to transpose a Common Law instrument into the Civil Law framework, this status will have to stand for at least a while.

Due to the general ban on interest-bearing instruments under Sharia law (traditional syndicated financing and loan products used in the Western world need to be modified for usage in a Sharia jurisdiction as they provide for interest and other credit fees), Trusts (where the Trust *res* may, under certain situations, bear interest) need to be structured so that they are Sharia-compliant (such as the *Waqf* instrument).

1.1 Civil Law

Civil Law as a legal system is based on ancient Roman law and is what lawyers call a statutory system. This means that the primary and by far predominant source of law is written text passed down as legislation by various procedural means depending on jurisdiction. These sources range from constitutional documents (as generally the highest law of the land) and laws passed by legislatures to decrees and local ordinances (on the lowest rung of the ladder). The primary role of the courts is to interpret the written laws and provide guidance in cases of ambiguity. Legal precedents may be binding, but only in select cases or narrow circumstances.

Civil Law tends to lean towards a iuspositivist outlook. In layman's terms, this means that there is a general understanding that it is feasible to capture the spirit of the law in codified form and that legal sources need not be found beyond the four corners of the page (with admitted allowances for textual interpretation to fill in the space between the lines).

1.2 Common Law

Common Law likewise uses statutes as of one of the key sources of law, but expands on that by fully recognizing judge-made law as an equally important source of law. Therefore, judicial precedents and the analysis thereof hold an important role within the system.

A judicial decision handed down by judges at various levels is usually composed of two elements, the *ratio decidendi* and the *obiter dictum*. The former is the actual text of the meritorious ruling ("Mr. Smith is ordered to pay one thousand euro to Mr. Jones") while the latter is the justification, allowing the court to explain the argumentation and reasoning behind its decision. Generally, only the ruling itself is precedential and as such a source of law, but the explanation is invaluable as a looking glass into the minds of the judiciary and usually studied just as meticulously as the decision proper.

The doctrine of *stare decisis* dictates that subsequent courts should abide and adhere to earlier decisions, unless the current case can be distinguished from the former. Therefore, by default, there would be a general presumption of similar outcome with regard to cases of similar factual circumstances [2].

The civil law of the Czech Republic (not to be confused with the Civil Law culture as defined above being the legal system – civil law as a type of law is the law governing private transactions between private individuals and businesses) has, until recently, been governed by the increasingly obsolete Czechoslovakian-era Act No. 40/1964 Coll., as amended.

This Communist-era codex from 1964 proved increasingly out of date, with one of the main criticisms being that despite its volume, it failed to codify the majority of civillaw elements in a single user-friendly volume. For example, commercial law was governed by a separate Commercial Code, providing for concurrent and confusing regimes of different products liability, warranty or contract formation and dissolution provisions depending on the status of the affected parties (whether in a private capacity or engaged in the conduct of business), while securities were governed by a special Securities Act.

Among the motivations for recodification (i.e. replacement of the laws mentioned above by a single massive codex) was to borrow or adopt certain elements from foreign jurisdictions. One of these foreign elements was the Trust – a concept heretofore unknown in the Czech legal context.

As of January 1, 2014, a new Czech Civil Code (Act No. 89/2012 Coll.) numbering over 2,500 separate sections, came into effect, and with it the Trust.

3. The Trust

The Trust, in plain language absent *legalese*, is a relationship allowing for the management of property by one individual for the benefit of another.

The creator of the Trust is called a Settlor and, depending on the subtype of Trust and the specific rules of the given jurisdiction, a special instrument called a deed is executed in order to create the Trust. The Trust is administered by an appointed individual called a Trustee, who is in a fiduciary relationship with either the Settlor or the Beneficiaries of the Trust or both. The Beneficiaries are the class of persons or individuals named as those deriving benefit (proceeds, income, interest) from the Trust.

Finally, the Trust must contain the *res*, or subject matter. This is generally the property or other valuable right administered by the Trustee for the benefit of the Beneficiaries.

If John executes a deed authorizing James to administer a bank account with a one thousand euro deposit with interest to be paid for Bill up until Bill reaches the age of 18, at which point control over the account is transferred to Bill, John would be the Settlor, James, the Trustee, Bill the Beneficiary and the *res* would be money in the account and the interest accrued.

This is called an *inter vivos* Trust - a Trust set up and operating during the lifetime of the Settlor.

However, the Trust as introduced in Section 1448 of the new Czech Civil Code is a very different animal, combining more testamentary features than any of its Common Law counterparts. Under Common Law, the Trust *res* the property therein is for the benefit of the Beneficiary – the Beneficiary is what we would call a beneficial owner, although as beneficial owner the Beneficiary does not have certain rights, such as the right to possess or control the *res*. This right of possession is generally assigned to the Trustee, as without it the Trustee could not carry out its duties set forth by the Settlor.

Unfortunately, Czech law does not recognize the concept of a Common Law Beneficial Owner and as such statutorily prescribes a rather cumbersome workaround. The new Czech Civil Code states that the Trust Fund is created by means of allocating assets which are at the time owned by the Settlor to the Trustee by contract (roughly comparable to the *inter vivos* Trust) or by testamentary means (a *mortis causa* Trust), i.e. a will. The creation of the Trust Fund is construed as meaning the creation of independent property which the Trustee is obliged to manage. All property rights vis-à-vis the Trust Fund are stipulated as being carried out by the Trustee in his own name on behalf of and for the account of the Trust Fund, provided however, that such Trust Fund is not the property of the Trustee, the Beneficiary or the Settlor.

To complicate things even further, Czech law is ambivalent not only as to the ownership of the Trust Fund (as Czech law does not recognize beneficial ownership), which it dismissed by claiming that the property effectively no longer belongs to anyone (or at least neither of the three effected parties), but also as to the creation itself. The new Czech Civil Code states that the Trust Fund is created by means of allocating assets (Section 1448).

However, it also states that the Trust Fund is created when the Trustee formally accepts his duties or, as the case may be, as of the date of the Settlor (Section 1451). Czech Law also states that the Trust Fund is not sentient, i.e. lacks legal capacity in and of itself and is unable to hold any rights or obligations on its own accord [3].

Therefore, Czech law has managed to create (at least from the perspective of comparative legal theory) a dead-end product – an instrument which no-one owns and which has no powers in and of itself. But how did this come to be? What has been lost in translation?

4. Transposition

Transposition is the adoption of laws or certain elements thereof from one jurisdiction to another, or, in this case, from one legal culture to another. Transposition can be full (where the complete sum of the foreign element, including all appurtenances is transferred outright) or partial, where only certain aspects are cherry-picked and transposed.

Full transposition of a legal instrument would require transplanting not only the specific legal instrument, but also any related decrees or bylaws governing its implementation or explaining and establishing its roots. For example, full transposition of a law protecting bears into a jurisdiction where bears are completely unknown would not only entail promulgating such law in the new jurisdiction, but also require changing the relevant animal laws of such new jurisdiction in order to define bears as a species – which in turn might necessitate updates to school curricula. Partial transposition, on the other hand, would only take one element – such as protection of specific bear behavior, transform it to suit animal behavior in the new jurisdiction and amend existing laws so that animals in the new jurisdiction are offered a new level of protection commensurate with that awarded to bears in the original jurisdiction, but without the legal baggage described above.

The Czech legislature went the way of partial transposition, and in doing so took a very simplistic approach. It looked to one of the two jurisdictions on the North American continent (Louisiana being the other) where Common Law and Civil Law meet – the Canadian province of Quebec.

Section 1260 of the Civil Code of Quebec states that "A trust results from an act whereby a person, the settlor, transfers property from his patrimony to another patrimony constituted by him which he appropriates to a particular purpose and which a trustee undertakes, by his acceptance, to hold and administer". Section 1261 further provides that "The trust patrimony, consisting of the property transferred in trust, constitutes a patrimony by appropriation, autonomous and distinct from that of the settlor, trustee or beneficiary and in which none of them has any real right." [4]

The Czech legislature could have gone the way of full transposition, as it did when it drew inspiration for certain corporate law institutes from German law in the early 1990s. Instead, it settled with an almost verbatim translation of the above, hoping that the mere fact that such provisions come from a mixed-law jurisdiction should somehow excuse the process of proper transposition. It does not.

Without knowing how the aforementioned patrimony works under Quebec law (and how it works in modern French law) and without examining whether taking an historically purely Common Law instrument (the Trust) and transposing it to a Civil Law jurisdiction from a jurisdiction other than a purely Common Law one (which has already modified the original concept), we are left with nothing more than a translation - one where no-one owns anything and no-one is sure when the Trust Fund is actually created in the first place. It is a "Do Not Feed The Bear" standing defiant with no explanation in a forest where no one knows what a bear is or what (not) to feed it. To wit, the Czech legislature has not reflected the role, if any, played by case law as judicial precedent and its effect on modifying and further explaining Trust intricacies and in effect changing statutory law itself – a phenomenon not otherwise possible in pure Civil Law jurisdiction as discussed above.

5. Conclusion

The concept of the Common Law Trust was uprooted and transplanted into a domestic Civil Law framework with neither precedent nor history to guide its implementation and usage.

References

[1] Boguszak, J.; Čapek, J. Gerloch, A. : Teorie práva, Eurolex Bohemia, Praha, 2001, p. 51

- [2] Knapp, V.: Velké právní systémy (Úvod do srovnávací právní vědy), 1. vydání, C.H.Beck, Praha, p. 21 et seq.
- [3] http://obcanskyzakonik.justice.cz/texty-zakonu/
- [4] http://ccq.lexum.com/ccq/en#!fragment/sec1260

THE INSURANCE OF THE CARRIER LIABILITY IN CARRIAGE OF GOODS BY ROAD PROCEEDED ACCORDING TO THE CMR CONVENTION¹

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Abstract: This contribution deals with the liability insurance of carrier by road from the contract of carriage by the CMR Convention. Particular attention is paid to the causes of the damage occurring in the international transport of goods, the procedure of the insurer and the insured in determining the extent of the damage and the procedure of the insurer and the insurer and the carrier's liability for the damage to the shipment.

Keywords: international road transport, the carrier's liability for damage, liability insurance of carrier in freight transport by road

1. Introduction

Doing business in international truck transport is full of risks that put a huge burden of whole spectrum of different responsibilities and obligations on shoulders of carrier. During the transport of shipments internationally, situations may occur, that the carrier is unable to prevent even when transported with professional care, and that may jeopardize his/her business. Reasonable carrier considers similar complications as an integral part of this business may elude a lot of problems by insuring his/her business properly. The term "insurance" is defined as a legal relationship in which the insurance company transposes the obligation to provide indemnification to the insured for the event, which was occurred in the context of agreed policy conditions. This commitment is carried out for remuneration - insurance. Insurance is an effective form of creation and redistribution of cash resources reserves provided by the specialized commercial organization – the insurance company.¹ Currently, the insurance market is only in the stage of development, so we can only use as a base only insurance policies that have been approved by the Ministry of Finance of the Slovak Republic. In our case, we will discuss the policy conditions for liability insurance of international carriers that are used by Allianz - Slovak Insurance Company. Conditions of insurance in general are a set of conditions agreed upon in the insurance contract or legal act which makes it possible to implement insurance and provide insurance benefits. General insurance policy determines the method of conclusion of a contract, onset, duration, method and terms of payment of insurance, the conditionality of insurance and the like. Usually it is possible to agree upon specific conditions for specific insurance and insured in the policy.²

2. Insurance of carriers liability for damage in road freight transportation

At the beginning it should be pointed out that the subject of my paper is insurance of carrier in road freight transport, which is often confused with the shipment insurance, which is insurance against property damage shipment in case of damage to shipments, total or partial loss of goods and costs transshipment costs of the accident and rescue costs. Insurance can be extended by additional insurance in the event of war, strike or insurance of exhibits during the exhibition or fair. The insured is the consignor or consignee. Insurance starts at the moment when the consignment is disposed on the vehicle up to the moment when a consignment is unloaded of the last vehicle. Carrier doing business in international transport, if an insurance contract has been concluded, will be insured against the consequences of his/her responsibilities. The insurance of carrier's liability in road carriage carrier shall provide to the carrier insurance protection against damage, destruction or loss of the consignment for which he/she is responsible. Risks covered by insurance are liability for the total or partial loss of the consignment, liability for total or partial damage to the shipment and liability for delay in delivery under the CMR Convention. An important provision of the terms is that the insurance also covers reasonable and efficient costs that had to be made to avert or minimize damage, for example: removal of damaged goods from the field to the store, etc. Insurance of carrier's liability is optional and based on negotiations on the contract between the carrier and the selected insurance company. Basically the policy covers the agreement of insurer to provide the agreed scope of delivery if there is a random event specified in the insurance contract concluded by a natural person or legal entity with the insurer, the insurer is obliged to pay a premium. Insurance contract is essentially a legal document drawn up in writing in accordance with applicable law. It expresses a particular insurance terms and conditions for the implementation of insurance. Agreed terms are binding on the insurer and the insured. In some cases, there is no insurance and insurance contract. Often, this document also says fuse.³

¹ http://www.allianzsp.sk/slovnik#P_10262

² http://www.allianzsp.sk/slovnik#P_10285

³ http://www.allianzsp.sk/slovnik#P_10285

Insurer is the legal entity that negotiates insurance and carries its message. May be an insurance company, or, in exceptional cases, an intermediary company.⁴ Note that an obligation arises from an insurance contract to the insurer to fulfill obligations set by an insurance contract, since the day after the conclusion of the contract or later. The Parties shall also agree on the fact that the insurance relates to the period before the contract was actually concluded. The insurer is not obliged to provide insurance if the other party to the contract, at the time of conclusion of the contract, knew or should have known that the insured event has already occurred. The insurer has the obligation to fulfill the obligation set by the insurance contract, if an event occurred which is linked with the obligation of the insurer to fulfill. This fact is called the incident which can be defined as an event which has been affected by the insured object or person in interest. Characteristics of events must comply with the agreed policy conditions. The practice also uses the term "damage".⁵ The insurance company is obliged to immediately carry out investigations necessary to determine the extent of its obligation to provide insurance benefits. Performance of the insurance company is then payable within 15 days from the date the insurer has completed examination. If the investigation of the insured event is not completed within one month after the insurer learned of the insured event, this is required to provide insurance to request an appropriate advance. Of course, the investigation and its length depend on the cooperation of the insured in the investigation procedure.

The insured person arises due to conclusion of the contract the right to insurance benefits, regardless of whether the insurance negotiated, or the contract was negotiated by another person.⁶ The basic obligations of the insured include the obligation to pay insurance premiums for an agreed period of the insurance. The insurance premium is the price for provided insurance services. It is calculated as the net premium plus the allowance for damage prevention, share overheads and profit insurance companies in the insurance.⁷ Unless otherwise agreed, the premiums payable on the first day of the insurance period and a one-time insurance on the day of commencement of insurance. The one-time insurance is that the insurance premiums were paid for the entire agreed period. In addition, the insured is committed by insurance contract to expend every effort and use all their resources and opportunities to avoid the damage of the carried goods (professional care). In addition to professional diligence, the carrier will have to show the insurance company that the vehicle or cargo was at all times properly secured against rolling, theft and fire. The vehicle must be fitted with safety devices and the driver has to park on the guarded car park. Breaking these terms may result in refusing the damage by the insurance company.

In such cases, it is preferable if were closed prior to shipment and insurance of transported consignments, which is characterized in this article. The carrier shall not get rid of its responsibility for damage. The insurance company will compensate the damage to the shipment, but then will claim the compensation of costs in the linear recovery proceeding. The carrier is obliged to observe the performance of transport however the legislation of the Slovak Republic relating to the carriage of goods and the international acts as well.

According to Article 1 sec. 4 of the CMR Convention the insurance policy conditions are not applicable to shipments that are excluded from the Convention on the Contract for the International Carriage of Goods by Road (CMR). It will be a transport carried out in the framework of international postal conventions, transport of corpses. In this case, the carrier may arrange extra insurance or may require that the principal has closed an insurance contract to insure the transport of this type of goods itself directly. Similarly, the carrier must reckon with the fact that some of the damage is not under the regulation; therefore, he cannot be insured against their occurrence. They are mainly caused by the insured intentionally. It also goes on damages, which is the subject to additional insurance against the carrier is not insured. Another case of exclusions from insurance damages are those damages that incurred as a result of delay, caused by insured person damage to the goods. Insurance conditions exclude insurance, transport of live animals as well.

In the case of an insured event the Insured is obliged to report this harmful event to his insurer. At first glance, it is not always clear whether the occurrence of the damage, which is associated with the event, the insured is responsible for. Conviction of his responsibilities will normally depend on damage which will claim with the carrier. If the insured fails to report your claim to the insurer, not the insurance unfolds dealing damage can't be handled and damage to the rule would be nothing other than claim their rights against the carrier by compensation through the courts. If the court declares the carrier responsibility for damage, this turns to his insurance company to take over the settlement of claims. It will not be willing to carry out settlement of claims if the carrier didn't announce the insured event in advance. Event giving rise to the insurance company announces documenting this event insured indicating the type of damage and the amount of damages to injured and required documents attached to the settlement of claims of legal significance. The announcement is a statement of the insured or his liability recognized or not recognized even specifying the reasons for that statement. Sometimes it may be the case that the insured can properly fulfill its reporting obligations to your insurance company, but it will not recognize grounds for compensation. In this case the insurer and the insured after the court proceedings agree whether the insurance claim insurance additionally recognized as legitimate, or whether the issue of liability of the carrier is left to the court's decision. It should be remembered that the court proceedings on the liability of the carrier for damage incurred does not, in its judgment obligation to provide surrogate insurance payment if the defendant only carrier.

⁴ http://www.allianzsp.sk/slovnik#P_10285

⁵ http://www.allianzsp.sk/slovnik#P_10285

⁶ http://www.allianzsp.sk/slovnik#P_10285

⁷ http://www.allianzsp.sk/slovnik#P_10285

Policy conditions allow the insurer took legal compensation carrier if there is a judicial process in accordance with the instructions of the insurer. Costs being borne by the insurer are not limited, so that the insurer will be obliged to pay them as agreed with the defense. Limitation of replacement insurance obligations can arise if the shipment originated considerable damage they will have to pay the insurance company and defense costs would have exceeded the insurance limit negotiated the contract.

If the insured person as an international carrier has entered into an insurance contract with the insurer, he accepted by the provision that in all cases in which the victim will recognize as eligible for damages incurred for transporting the consignment will be insured their insurance company billed participation of 10%. The insurance company will pay insurance benefits in the amount of identified experts agreed between the parties or minus 10%, which will pay the carrier. The carrier may be obliged to higher participation, and where the harmful event occurred due to the influence of alcohol, narcotics and drugs driver carrier. In this case, the amount of co - 30 %. If damage to the consignment transported arose due to technical incompetence to operate a vehicle to transport or receipt of goods, and the inability to be had from the beginning of the transport carrier known, the amount of excess of 20%. If the carrier has committed a serious breach of ADR on the transport of dangerous goods, his participation will increase to 70 %. These percentages definition of complicity carrier is indicative only a matter of individual

insurance deductible as quantified in terms of their insurance.

3. Conclusions

In my article, I explained the problems each carrier faces on daily basis. The carrier never know for sure predict when damage occurs to the consignment transported and what is the cause of that damage. Of course, it must undergo everything possible to prevent the damage, but it is not always possible. Therefore, I find it great that insurance companies among its product offerings included liability insurance carrier in road freight and insurance services associated with this constant evolution. In the future, I plan to issue international insurance carriers pay more in depth and I hope to bring new scientific knowledge in this area that will enhance not only legal theory but mainly underwriting practices.

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References

[1] http://www.allianzsp.sk/slovnik

THE ROLE OF TRANSNATIONAL CORPORATIONS AND FOREIGN DIRECT INVESTMENT (TNCS AND FDI) IN THE GLOBAL ECONOMY

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Abstract: The process of opening economies and expanding the idea of free trade have increased the possibilities international business activities, providing them with almost unlimited access to the resources and factors of production. Increase in the position and strength of international companies on the international scene was the result of the so-called global presence of increasing independence towards nations, and also the growth of potentials and expansion of interactions. Therefore, an important manifestation of globalization is the international flow of capital, especially the expansion of transnational corporations (TNCs). They appear as factors which co-create the process of globalization, and constitute one of its main driving forces. The importance of both foreign investments and corporations and their important role in the global economy tend to regard them as one of the main manifestations of globalization.

Keywords: global economy, transnational corporations, foreign direct investment

1. Transnational corporations

The internationalization of economic activity, that is keeping it abroad, is a complex process and indicates a growing geographic scope of this activity, performed in a sequential or complementary manner with the use of three forms: trade, contractual cooperation and foreign investments which aim at creating foreign subsidiaries and joint ventures. Foreign direct investments (FDI) were (and still are) considered as a determinant of an international expansiveness of enterprises, their wealth (in capital, including human resources, technology and other supremacies), managerial skills, knowledge of foreign markets and other important attributes. The growing volume of global FDI and the growing involvement of transnational corporations in international trade have become for researchers the evidence of the ongoing expansion of the companies abroad, and indirectly changes taking place in them.

Now, I am going to analyze international flows of capital, focusing mainly my attention on the flow of foreign direct investments. I begin with the presentation of foreign investments generally, and then I am going to present the analysis, the genesis of creation, and activity of transnational corporations. The considerations are focused transnational corporations' activity. mainly on the Corporations affect the progress of the process of globalization through an influence on the global economy. Their presence can manifest itself in two ways: indirect and direct [6, p.140]. The indirect form is based on the presence of corporate goods and services outside the borders of home country. This form of the presence is seen as a transitional stage, followed by a further process of transition to a more complex phase of foreign activity that is investments. The direct form of global presence of corporations are direct foreign investments (FDI).

Broad definition of corporations based on the presentation of the organizational structure gives the United Nations Conference on Trade and Development (UNCTAD) in World Investment Report 2002. The definition of UNCTAD also determines the position of the parent company and affiliated entities associated with it (see Diagram 1).



Diagram 1. The organizational structure of transnational corporations

Source: Own study based on World Investment Report 2002, Transnational Corporations and Export Competitiveness, 2002, p. 291

Transnational corporations consist of a parent company and branches abroad. Because of the legal form, the branches are subsidiairies and related entities, which have legal personality and branches without legal personality. In a related entity the transnational corporation has no more than 50% of votes. However, in the subsidiary it has more than 50% of votes, therefore, the transnational corporation has the right to appoint and remove members of the administrative body, the management and the supervisory authority. In turn, the branches of the parent company, that is the entities belonging to it in whole or in part, are permanent agencies, offices in host country, companies which have no legal personality or joint ventures, land, buildings and other property belonging to a foreign entity and movable equipment used outside the territory of the home country of the investor for over a year.

Transnational corporations are formed and evolve through foreign direct investment (FDI). Direct foreign investments are based on locating the capital abroad by the parent company in order to obtain a direct impact on the activity of companies injected with capital with an the intention of financially support the entity in which the investor has significant share, or in order to create a new economic entity [5, p.78]. Direct investment include investment transactions undertaken by the investor abroad in order to exert a direct impact on the production of the company in which the money are invested, or to provide finances, goods, technology, in which the market investor has ownership interests. Therefore, one shall not treat investments only as an international transfer of capital, but as a specific type of transaction which connects the capital, experience and enterpreneurship [3, p.27].

In accordance with the definition of the Organisation for Economic Cooperation and Development (OECD) and the International Monetary Fund (IMF), one is dealing with FDI when a resident of one economy (direct investor) obtains a lasting benefit from the capital of an entity registered in a country other than the country of origin of the investor. Lasting interest points to a long-term relationship between the investor and subject of the investment, the latter has a significant impact on the management of the company. In the definition of the IMF attention is drawn also to the threshold level of participation in a company that allows the investors to effectively influence the decisions of the company. It is 10% of the ordinary shares or voting rights. This percent is considered to be sufficient because of the large dispersion of shares between different individual investors.

In today's global economy, there has been no harmonization of conditions of activities of foreign investors. There are still differences in this respect between the different countries, but all countries continue to restrict the flow of FDI to sectors of strategic importance. Foreign capital investments allow to reduce international imbalances in capital equipment and promote new technologies [1, p.138].

Distribution of FDI in the world is not uniform. In the past there was a tendency to see the concentration of investment flows in developed countries, especially the countries that K. Ohmae [11, p.59] called Triad consisting of: the United States, Western Europe and Japan. Currently, the Triad is defined more broadly by including nearly thirty countries in America, Europe and Asia. This group includes the countries of Western Europe, North America (USA and Canada) and East Asia (Japan, Singapore, Hong Kong, South Korea, Taiwan). Resources and FDI flows show a strong dominant position of the Triad countries among exporters and importers of foreign direct investments. Such a expanded Triad produced in the 90s of the twentieth century almost 50% of world GDP, and the outflow of foreign direct investment accounted for 95% of world outflows [21, p.9].

Over the last twenty years, the annual inflow of FDI in the world increased ten times from 60 billion USD in 1985 to 651 billion U.S. dollars in 2004. While in 2007 foreign direct investment in the world amounted to 1.8 trillion dollars, which meant an annual increase of 30%. The important role of FDI in the world economy is also evident when comparing to other forms of international economic relations. And so, in 2005, global export of goods amounted to 8907 billion USD, services 2125 billion USD, while the value of global FDI (inflow) was - 648.1 billion USD [14, p.39]. In 2007, global export amounted to over 1.3 trillion USD and of services 3260 billion USD [15, p.11].

FDI reached the highest level in the history in 2000 - 1388 billion USD. In 2005, 690,000 of companies - subsidiaries dependent from transnational corporations were responsible for export worth 3690 billion USD and employed 57,394 thousand employees. In 2006, 10% of world GDP came from foreign branches of transnational corporations and one third of world export and only 3% of employment in the world [16, p.14].

FDI flows were associated in the 90s of the twentieth century, among other things with the processes of privatization (especially in the International Commission on Civil Status). Currently, almost 70% are mergers and acquisitions. The influx of investment demonstrates the attractiveness of the host country, while the outflow is an expression of the strength of local companies and their ability to expand abroad. Among the most attractive FDI location China is listed (consistently since 2001), the United States and India. Among those countries on further positions are Poland, the Czech Republic. Most attractive locations for investment in previous years - Europe and the United States which both contribute to 58% of global GDP - are replaced by fast-growing countries such as China and India. Countries of the Western Europe, including new Member States of the European Union continue to enjoy a growing popularity. As it is shown in the diagram, Russia is on the fifth place. This result may suggest that it a very attractive country for investments but its political instability may discourage the inflow of direct capital from the industrialized countries, such as it is in case of Ukraine, where the political - economic climate does not encourage entrepreneurs from the industrialized countries seeking transparent market conditions to invest [2, p.7-28]. An important element which drives foreign direct investments are international mergers and acquisitions (Mergers & Acquisitions M & A). The dominant trend in the global mergers and acquisitions were growing profits of corporations, favorable financing conditions, the increase in the value of shares in the financial markets, a significant increase in the involvement of private equity funds and other common investment funds in these transactions.

Transnational corporations develop through direct foreign investments. They constitute a major economic force in highly developed countries and "the driving force of globalization" [11,p.49]. Transnational corporations develop through direct foreign investments. They constitute a major economic force in highly developed countries and "the driving force of globalization" first position of corporations in the world economy in recent years continues to grow, both in terms of numbers, capital engagement, involvement in world gross product, export and transfer of technology. The fact that multinational companies occupy an important place in the global economy is proved by empirical data. In 2005, there were 77 000 multinational companies, and the number of their foreign branches reached 770, 000, whereas in 2008 there were 82 000 of them with 810 000 subsidiaries. The branches of transnational corporations created the added value equal to 4 500 billion USD. They employed about 62 million people, while in 1982 they employed 18 mln of them. Affiliates exported goods and services worth more than 4 000 billion. Sales of goods and services by transnational corporations in the same year amounted to about 18 billion USD [17, p.17], thus twice more than world export (8 billion USD) [18, p.3-14]. TNCs are mainly from countries of the Triad, consisting of the European Union, Japan and the United States. According to Zorska [19, p.48], in the total number of TNCs approximately 10% conduct a global activity, and these are the companies with the greatest economic potential. The highest growth is recorded in revenues and earnings of the largest oil companies, but the situation is good in automotive companies and suppliers of services (financial, commercial, and communications). Revenue of the largest corporations are higher than the gross domestic products of many countries. For example, Exxon Mobil Corporation's revenue (291.3 billion U.S. dollars) in 2005 were higher than the gross domestic product of Austria (over 275 billion) and Sweden (270.5 billion USD). On the other hand, Ford's revenue (171.7 billion) exceeded the GDP of Hungary (169.9 billion), and the revenues of Royal Dutch / Shell Group (265.2 billion) - the GDP of Switzerland (236.9 billion). Transnnational corporations are a major group of companies most involved in the process of globalization and carry it through their activity [8, p.127]. Through their activity a long-term process of integrating national economies outside their borders by intensifying mutual relations result in a world-wide (global) economical system [20, p.57-58].

2. Transnational corporations

By presenting transmitional corporations I describe also their characteristics (Fig. 1). The literature highlights the following features: sovereignty, distribution, complexity, specialization, flexibility, the ability to integrate and maintain, as well as the global development of efficiency. It seems that to these characteristics one shall add two important attributes - support the knowledge and networking. These traditional and modern features (marked in red) are shown in Figure 1, further distinguishing structural features.

Sovereignty as a feature of TNC concerns taking up strategic decisions and actions. Sovereignty refers rather to host countries of TNCs as investors than home countries, where the relationship corporations - state authorities are closer. In TNC decisions of a single company become less

sovereign because of their cooperative ties in the form of strategic alliances and other contracts.



Figure 1. Traditional and modern characteristics of TNC

The complexity is a feature of transnational corporations. It can be understood as a large number of critical and interacting elements in the system (for example, the value chain, the structure of the organization) or in a specific context (ownership, competitiveness, strategy). Dispersion defined as the geographic spread, capacity for is innovation (knowledge) and production - trade. Now, from the point of view of TNC distance in relation to the most favorable location is not the most important criterion. And very important is the relative scale of the locational advantages of a particular economic characteristics over other solutions taken into account. It is the power of advantage constitutes a stimulus to invest in a particular place abroad in order to use the optimum locations for activities and their dispersion in the global or regional scale.

Knowledge has become the key resource of companies. Knowledge-based competitive advantage of TNC is based on the fact that - firstly – they have ability to implement innovations, and - secondly - the ability to integrate knowledge from different sources - internal and external (research centers, and from other companies). In TNC knowledge plays a key role in the allocation of other resources, configuration of the value chain and in developing the structure of the organization.

Expertise is defined as the taking up, by the selected branch, specific activity for the needs of the global market. The ability of TNCs to integrate actions distributed geographically, functionally specialized and adjusted locally constitutes a feature which defines cross-border strategies and structures of corporation. The ability to integrate means also the ability to create integrated systems of cooperation. Flexibility is the ability to quickly, efficiently and effectively adapt to changes and adjustments inside and outside the organization.

Networking is now an essential attribute of TNC, which is based on creating a system of nodes and relational links. Depending on the considered level of system business network nodes may be understood as individuals, organizational units (e.g branches) or organizations (companies), and the relationship between them is the flow of information and products or other production factors. The ability to arbitration is the ability to use existing in the world differences in economic, geographical, administrative and cultural conditions of transnational corporations in order to optimize and maximize the profit of TNC. Global efficiency is expressed in the optimal allocation of tasks / research, production, trade actions between the parent company and branches, subsidiaries and affiliates operating in different countries.

Corporate actions include not only the flow of investment capital, trade in goods and services, the development and transfer of technology and know-how, but also the flow of management personnel between branches. Corporations coordinate and monitor various stages of production in different countries. They may obtain benefits from of the differences in the distribution of the factors of production (natural resources, capital, labor) in the world and the differences in the economic policies of each country (including different tax rates, subsidies). Their production strategies, product development, marketing and purchasing shape the international division of labor.

The main purpose of the corporation is to maximize profits. In addition, the important targets are the freedom of production, distribution and investment. Specific categories of these values include among others the mass privatization of public enterprises and services. TNC become so a response to qualitative changes in technology of information transfer, and also the change of the role of particular factors of production and a way to the liberalization of international economic relations.

As already mentioned, the aim of the company is usually maximization of profit. A foreign branch is established when the company because of this may have profits that at least compensate for losses resulting from the not-knowing the market, especially taking up risks and costs of coordinating international activities. These benefits may result from having property assets and access to cheaper than at the disposal of competitors, sources of natural resources and factors of production [13, p.89].

TNCs are not homogeneous, but vary in size and nature of the business. One also shall not identify TNC solely with large companies, because of among the entities competing in the global market, the significance of smaller but highly internationalized companies that are called micromultinationals or the born globals. "Born global" companies is one example of the new types of businesses in the current phase of globalization, but not the only one. Talking about the different causes of the establishment of branches of foreign companies it is worth to distinguish between vertical and horizontal multinational enterprises. Markusen and Maskus [7, p.1] define vertical multinationals as companies which divide production on locations which are in different geographical regions. There are produced different technological products (components) using comparative advantages of each location. Horizontal multinationals are completely different in nature, they employ a lot of employees, conduct similar activities in different countries of the world. Horizontal multinationals are established to produce products and provide services destined for the branches in each location and its neighboring countries.

Multinational companies take up manufacture in different countries in order to minimize costs. And so, for example, multinational companies take-up labor-intensive activities in acountries which are rich in labor, because wages there are relatively low. This means that the final product is not created in one country, but in many. Semi-finished products which require huge input of raw material is done in the vicinity of the place of extraction of this product. Components whose production is labor-intensive, are produced in countries with cheap labor. The capitalintensive products which require technical knowledge (know how) are made carried out in industralised countries [9, p.9].

Increasing dominance of TNC shall be completed by indicating their basic functions, which are: the movement of assets and production – trade capabilities, stimulate growth and profitability, empowering local resources, the use of market competition, the transfer of new methods and practices and integrate the activities of enterprises and economies.

However, the activities of TNCs is sometimes criticized. According to some theoreticians the expansion of TNC aims at exploiting poorer countries. Main charges against TNCs concern the effects of the expansion of transnational corporations, attitudes and government policy towards foreign investors, and the participation of TNCs in globalization and their impact on the outcome of this process. FDI for the host country and it something that brings it benefits. Foreign direct investment has a relatively less volatility than short-term capital flows. On the other hand, multinational companies are more footlose than indigenous companies as they develop overseas production in an extend which is easy to move between different locations. As a result, multinational companies are considered to be the cause of job instability and fluctuations in tax revenue in the regions where they are located.

At present, the development of transnational corporations is also seen through the prism of new communication techniques and the evolution of the factors of production in the liberalized international trade exchange [4, p.142]. The ability to use modern communication techniques, determines the competitive advantage because due to quick and reliable information one is able to make effective economic business decisions, among other about the loacation of economic activity, its scope and size. The second element that determines the development and high competitiveness of corporation is their care for the intellectual capital. I agree with W. Szymański [12, p.32], who claims that the combination of advanced knowledge with the abundant factors of production allows to expand such scale of production which creates the opportunity for further development, funding and implementation of technical progress.

Current, relatively high growth in foreign direct investments, may be inhibited not only by changes in the policies of particular national governments, which compete with each other to attract foreign capital but by further development of transport connections in the whole world and the gradual elimination of tariff and non-tariff trade barriers. With a decrease of transportation costs, it is easier for many companies, not just multinationals, to deliver goods to foreign markets by means of traditional export, rather than by establishing new factories and R & D centers. Depending on further progress in the liberalization of world trade and the rapid elimination of barriers which inhibit the development of economic cooperation in the global scale, there will be a slowdown in flows of foreign direct investments and growth of foreign trade. However, it seems that this expansion will not be inhibited.

Important for the current rapid expansion of transnational and multinational corporations may be the desire of national governments and certain international organizations, to take control over global activities. Previous attempts to implement the International Code of Conduct for multinational enterprises, and effective control of internal trade, did not bring any results. However, many fields of the corporation's activity continues to operate outside the control of national governments and the situation in this regard so far, has not been improved.

3. Conclusion

In conclusion, the size of the global foreign direct investments are growing much more rapidly than world trade or production, which in turn causes a rapid increase in the role of FDI as a "binding agent" of global economy. With increasing globalization, FDI are increasingly used to minimize the possible adverse effects of globalization and enhance its positive effects. Over the course of liberalization of restrictions on FDI it is important not to cause a situation where national regulations and restrictions could be replaced by a restrictions put forward by private companies. Those countries that fail to attract foreign investors and use them as a catalyst in the process of modernization of the domestic industry, are at greater risk of being on the verge of globalization of the world economy.

References

1.B. Czarny, *Gospodarka otwarta* [w:] Globalizacja od A do Z, pod red. E. Czarny, Warszawa 2004, p.138

2.E. Czarny, J. Menkes, *Napływ kapitału bezpośredniego a system polityczno – gospodarczy w krajach słabo rozwiniętych (Przypadek Ukrainy)*,[w:] Myśl Ekonomiczna i Prawna, Warszawa 2008, p.7 - 28.

3. J. H. Dunning, *Studies in International Investment*, London 1970, p.27.

4.P. Ghemawat, *Semiglobalization and International Business Strategy*, Journal of International Business Studies, Vol. 34, 2003,p.142.

5. I. Goldin, K. Reinert, *Globalization for development: trade, finance, aid, migration, and policy,* New York 2006, p.78.

6. A. Jarczewska-Romaniuk, *Korporacje w procesie globalizacji*, Sprawy Międzynarodowe, no 1, 2003 p.140.

7. J.R. Markusen, K.E. Maskus, *Discriminating among Alternative Theories of the Multinational Enterprise*, Washington 1999 a, p.1. 8. A. Miara, Korporacje transnarodowe jako siła napędzająca procesy globalizacji, Warszawa 2004, p.127.

9. I. Moosa, *Foreign Direct Investment*. *Theory and Exidence*, Houndmills - Basingstoke 2002, p.9.

10. A. Müller, *Globalizacja – mit czy rzeczywistość*, [w:] *Globalizacja od A do Z*, pod red. E. Czarny, Warszawa 2004,p.49

11. K. Ohmae, *The Borderless World: Power and Strategy in the Inter – Linked Economy*, New York 1995.

12.W. Szymański, *Globalizacja wyzwania zagrożenia, Warszawa 2002, p.* 32.

13. M.A. Weresa, *Globalizacja działalności innowacyjnej* we współczesnej gospodarce światowej, Warszawa 2008.

14.World Economic Situation and Prospects 2006, *Financial flows to developing and transition economies* New York 2006, p.39-42.

15.World Trade Report 2008: *Trade in a Globalizing World*, WTO 2008, p.11-12.

16.World Investment Report 2004: *The Shift Towards Services*, UNCTAD, New York and Geneva 2004, p.367.

17. World Investment Report 1994 Transnational Corporations Employment and the Workplace, United Nations, New York and Geneva 1994, s. 15-17, World Investment Report, World Investment Report. Transnational Corporations, Agricultural Production and Development, New York and Genewa 2009, p. 17.

18.World Investment Report 2007, *Transnational Corporation, Extractive Industries and Development,* New York and Geneva 2007, p.3-14.

19. A. Zorska, Korporacje transnarodowe. Przemiany, oddziaływania, wyzwania, Warszawa 2007, p.48

20. A. Zorska, Globalizacja i regionalizacja a KMN w Polsce i na świecie, [w:] A. Zorska red. Korporacje międzynarodowe w Polsce. Wyzwania w dobie globalizacji i regionalizacji, Warszawa 2002, p.57-58.

21. A. Zorska, Ku globalizacji. Przemiany w korporacjach transnarodowych i gospodarce światowej, Warszawa 1998, s.9.

MOBILE PAYMENTS: A THREAT OR AN OPPORTUNITY FOR THE BANKING SYSTEM ALBANIAN CASE

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Abstract: Electronic payments are covering a wide range of services and products' purchase now and can be performed using several payment methods. This paper will analyze mobile payments landscape in Albania and the correlation they have with the banking system. Due to the advancements in the information technology, online payments in several cases are performed outside of the banking ecosystem by placing a real challenge to banks, taking in consideration the actual difficulty they are facing due to global crises, these payments decrease banks' share of electronic payments. Mobile payments have become a reality and these transactions are increasing day by day. Banks have to react in an efficient manner to make these payments part of the system. While the electronic payment model is based mainly in a credit and debit card, mobile payments are using a wider range of electronic money like electronic wallets, vouchers or available airtime that are not always stored into banks or financial institutions.

Keywords: Mobile Payments, Bank, Electronic payments, Cash

1. Introduction

The mobile phone has become part of our daily life and for a vast part of us it is considered more important than the wallet or credit card due to its wide range of usage and functionalities that increase every day. Several providers are using mobile phones as an electronic wallet, credit card readers or payment initiators using several technologies like NFC (Near Field Communication), USSD/SMS (Unstructured Supplementary Service Data/ Short Message Service), APP (Application), SIM based APP. The models that are available to initiate mobile payments are Operator Centric, Bank Centric, Collaboration and Pear-to-Pear. In these models, the bank is used, but is not always the main actor and beneficiary except in the bank centric model. The world of mobile payments is populated by all sorts of different players and stakeholders, such as financial institutions, MNOs (Mobile Network Operators), technology providers, regulators and many others [8]. The actual world population is more than 7 billion, and 5 billion people use mobile phones, meanwhile 2 billion have a bank account [10]. By taking in consideration this statement, it is obvious that the bank must try to integrate mobile users in the banking system to increase its customer base, customers' loyalty toward the bank due to attractive and innovative products and also increase revenues from mobile payments performed by its customers. Since banks are more controlled by the government, bringing mobile users into the banking system is in interest of the governments too because it will decrease informal payments and the cash quantity in the market. The best way to bring mobile phone users into the banking system is to offer the mobile banking product like

mobile banking and mobile payments by banks or in collaboration with third parties that offer mobile payments through bank accounts or by implementing mobile banking. Mobile payments have been very successful in poor countries, for example M-Pesa in Kenia, introduced by Vodafone in collaboration with Safaricom, has been a very successful product for performing mobile payments. Also other products like Square, a simple tool that is used in smartphones and allows them to be used as a credit card processor to perform payments, is a successful product in the USA (United States of America). Nowadays, we can find in the market a lot of solutions for mobile payments using simple and old technology, like based in GSM (Global System for Mobile), services using USSD functionality or simple SMS, mobile apps used in smart phones or HW (Hard Ware) equipment, that read mobile phone commands like NFC technology or card readers. This paper has been motivated by the large variety of mobile payment solutions and the role that banks have to play to increase its influence in these payments.

2. Problem

There are many organizations that are investing in mobile payments based on the current success of these payment methods and the penetration of mobile phones worldwide. We can mention MNOs like Vodafone, e-commerce companies like Google, payment service providers like PayPal and many others. Several banks are introducing their mobile payment products and some others are waiting for the market to mature. According Ernst & Young mobile money that includes all types of monetary transactions executed via mobile phones [1] are:

Mobile banking: Stock trading, Bill payment, Inter account fund transfer, Account enquiry.

Mobile commerce: Train fare, Parking, Shopping, Digital contents.

Mobile money transfer: Pre-paid card top-up, Person-toperson transfer, International remittance.

There are several models that can be used to perform mobile payment using mobile device.

In an Operator-Centric Model for example, the bank's revenue share from providing the trust account function may be limited to 10% whilst 55% goes to the mobile network operator and 35% to the distributor [3]. Mobile payments are increasing and also non-bank mobile payments are duplicating [5] their volume each year by significantly reducing bank's share in these payments. There are several methods for banks to profit by mobile payments and also to add value to their services that will increase clients' loyalty toward the bank. In Albania, there are two organizations which offer mobile payments using different models and a third one is expected to start by December 2014. Banks already take their share on both initiatives, but still it is not evident which model is the most suitable for banks to maximize their profit and to add value to their products. By analyzing the Albanian market, survey's results and the Central Bank's (Bank of Albania) report I'll try to show the most suitable model that the bank has to use for succeeding in mobile payments.

3. Literature review

There are multiple alternatives to cash, ranging from credit cards and checks to mobile payments service, among others[6]. Mobile payment is defined as "paying for goods or services with a mobile device such as a phone, PDA (Personal Digital Assistant), or other such devices [10]. Mobile payment is regarded as the next big innovation that will enhance the existing e-commerce and m-commerce efforts to unleash the potential of mobile business [11]. Consumers are using their mobile phones to make payments in over 130 deployments with a 100 deployments more planned and several new initiatives announced each week [12]. Mobile is the payment technology that will have the greatest growth over the next five years [2]. Growth predictions for mobile payments vary from 350 to 900 million users generating USD 430 billion to 1 trillion in transaction value by 2015 [7].

4. Data analysis

In Albania operate two mobile payment companies with different solutions, the first one uses a bank centric model, and the other one uses an electronic wallet to process payments. Also Vodafone Albania is introducing M-Pesa and will start a pilot of this product by the end of 2014. According to AKEP (Authority of Electronic and Postal Communications) the mobile penetration based on active users is 130% and based on SIM cards it is 187% by the end of 2013. According to INSTAT (the Institute of

Statistics) the Albanian population in 2013 was 2,895,947 and the current bank accounts were 2,724,668 according to BOA (Central Bank of Albania). It is evident by these statistics that the mobile penetration in Albania is very high and also most of the Albanian citizens have a bank account. By taking this in consideration, both MNOs and banks can use their base of clients to introduce mobile payments in the Albanian market. M-PAY and EasyPay are the two companies that offer mobile payment services in Albania but that use different models for performing these payments. M-PAY connects the customer's bank account with his/her mobile phone number and EasyPay connects the customer's phone number with his/her mobile wallet that is stored in a bank account. In both mobile payment products, the banks are playing an active role but the level of involvement and approach to the mobile payment product is different. In the mobile payment product, that is offered by the organization EasyPay, the bank offers to the clients the possibility to put money into their electronic wallet by transferring the money from their personal accounts to the mobile wallet account. In the mobile payment product that is offered by the organization M-PAY, the bank allows the clients to connect their bank accounts with their mobile phone number and enable the clients to start mobile payment transactions from their mobile phones. According to a survey conducted by M-PAY, it was clear that the bank was the main factor in increasing the client base of the organization. According to the survey conducted by M-PAY, 91% of the questioned clients were informed about the service by or in the bank and only 9% of them were informed about the service from other sources.



Figure 1: M-PAY's survey on how were the clients informed about the product

Another indicator of the success of mobile payment versus mobile banking is that the number of clients using the mobile payment product increases much faster that the number of mobile banking users.



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Figure 2: Mobile Payment transactions worldwide (in Billion £), Capgemini Analysis, 2013

According to Capgemini World Payment Report 2013[11], as described in figure 2, mobile payment transactions increased by 58.5% in comparison with 2012, and nonbank providers' mobile payment transactions increased by 92.3% meanwhile bank providers' mobile payment transactions increased by 55.4%. By analyzing this trend, is evident that non-bank providers are increasing very fast in volume and soon will take a big market share in mobile payments. In Albania, mobile banking is not considered a successful product because it is not easy to use, it is limited only to smartphones and there aren't a lot of services that can be paid through this service. Furthermore, this product has a monthly fee that users are not willing to pay.

4. Mobile Payment Models

There are several payment models that can be used for mobile payment transactions:

Operator-Centric Model: The mobile operator acts independently to deploy mobile payment services. The operator can provide an independent mobile wallet from the user's mobile account (airtime). A large deployment of the Operator-Centric Model is severely challenged by the lack of connection with the existing payment networks. The mobile network operator should handle the interface with the banking network to provide advanced mobile payment services in the banked and under banked environment. Pilots using this model have been launched in emerging countries but they did not cover most of the mobile payment services' usage cases. Payments were limited to remittance and airtime top up.

Bank-Centric Model: The bank deploys mobile payment applications or devices to clients and ensures that the merchants have the required POS (point-of-sale) acceptance capability. The mobile network operators are used as a simple carrier, they bring their experience to provide quality of service assurance.

Collaboration Model: This model involves the collaboration between banks, mobile operators and a trusted third party.

Peer-to-Peer Model: The mobile payment services provider acts independently from the financial institutions and mobile network operators to provide mobile payments.

5. Mobile payments

The third world is the main region where mobile payments are having a lot of success and also they are mainly performed outside the bank by using the Operator-Centric Model. This behavior is already present in Kenya considering the big success that Safaricom's product MPESA is having on P2P payments. This product is used by 40% of the adult population in Kenya and is using around 12000 agents all over the country. The decision to expand M-PESA's reach to the South African consumers was most probably prompted by the fact that while the mobile penetration rate among the adult population is over 94%, around 26 million South Africans have no official bank accounts [9].

The specifics of the mobile payment services offered by each mobile payment provider in Albania are described below in correlation with the banking system:

EasyPay uses electronic wallets and credit cards to perform electronic transactions through mobile phones. This organization has accounts in almost all the banks and also this organization stated that by the end of 2012 it had 250 agents all over the country. According to the organization, it has performed 175,799 transactions domestically and 5746 transactions internationally via PayPal [4]. In this model, the bank is used just for maintaining the account that is used by the users to deposit money in their electronic wallet. The bank withdraws its profit from the balance of this account by investing it. The bank does not profit directly from each mobile payment transaction performed by the client of this organization. This model allows the organization to use both banks and agents to enable mobile payment transactions. The clients are registered at the Easy Pay website or at the agent's office. The bank has no control over the clients.

M-PAY uses a bank-centric model where clients are registered at the bank's branches and the bank is presenting the product as a bank product. M-PAY is used like a mobile payment processor and also as a second level support. The target clients of this organization are only the clients that already have a bank account. The bank account is connected directly to the phone number by the bank operator using a web based interface. The clients' loyalty toward the bank is increased because the product is offered by the bank and the client is using directly its bank account without blocking any money into an electronic wallet like the EasyPay model. M-Pesa is using an electronic wallet too, but in its case, it is using the bank as an agent. In this case, the bank will profit from the wallet account located in the bank and also from the sharing that will take during its operations as an agent of M-Pesa. The bank still has no control on M-Pesa users and also it doesn't necessarily profit for each mobile payment transaction.

By taking in consideration the strengths and weaknesses of the three models of mobile payments that are operating in Albania, it is clear that the best model that the banks have to support is the model offered by M–PAY because this product is sold directly by the bank by adding value to the bank products and also increases the clients' loyalty toward the bank because mobile payments are very suitable, especially for paying monthly bills and prepaid services like Pay TV, parking tickets or top up. There is no need for the bank client to go frequently to the bank and use bank resources like it often does in the mobile payment solutions based on an electronic wallet.

But still there are some weaknesses that the bank has to consider in the mobile payment solutions that use the bank-centric model. There are 16 banks operating in Albania and we can say that Albanian users are supported well by the banking system. Banks are competitors between each other and they can't use their synergy to deploy one mobile payments product for the country, instead they offer their own mobile solution that fragment this market and doesn't use economy of scale and synergy for better result. It is difficult for the banks to agree on supporting a given product because they belong to bigger groups and have different nationality so they will stick to their strategy and preferred partners. Another issue that rises from the bank-centric model is the opposite of it, the mobile-centric model. In Albania are operating 16 banks but only 4 MNOs, and Vodafone has 60% of the market of prepaid SIM cards. By taking these figures in consideration, if the dominant MNO wants to introduce mobile payments by using the airtime of the mobile phone and also its agents all around the country, for sure the penetration in the market will be 100% of its users' base because the MNO will offer the service to its users without having to bring them into a branch office for registering for the service.

6. Conclusions

In a world driven by ubiquity and globalization, mobile payments are expected to increase each year and the banks have to take an active role to make these payments part of banking system, by either developing such technologies by themselves or enter in partnership with mobile payments providers, a successful alternative for paying. These payments are an opportunity for banks to increase its role into these markets.

MNOs and mobile payment providers will use the most suitable mobile payment model for increasing the profit and also increasing the clients' base. MNOs are already performing this kind of transactions using the airtime into client's phone and they share the profit with agents that can be banks or others. By considering the wide penetration of mobile phones almost everywhere nowadays, this behavior is a threat to the bank since mobile operators themselves offer money transactions.

The increase of mobile payments will result in the reduction of cash, especially in countries that are under development, and this reduction will help in performing payments using controlled channels like banks or financial institutions, and by taking this in consideration the governments have to help such initiatives to be introduced. Mobile payments are more secure when the clients' data is processed by the bank than by other means like agents. The banks already have the experience and the tools for clients' data protection, meanwhile the agents or third companies can have a weak system of protecting clients' data. Security of client data and electronic transaction is

very important and a key element in mobile payments, and should be carefully monitored by government.

References

[1] Ernst & Young, Mobile money, An overview for global telecommunications operators, http://www.ey.com /Publication/vwLUAssets/Mobile_Money./\$FILE/Ernst%2 0&%20Young%20-%20Mobile%20Money%20-

%2015.10.09%20(single%20view).pdf, pp 6

[2] Global Payments Survey 2011, Edgar, Dunn & Company

[3] Greenwich consulting, October 2010

[4] http://www.albconsulting.org/sites/default/files/The% 20Case%20of%20EasyPay%20ALBANIA_L.Shomo_062 013.pdf

[5] http://www.capgemini.com/resource-file-access/resou rce/pdf/wpr_2013.pdf

[6] http://fletcher.tufts.edu/CostofCash/~/media/Fletc her/Microsites/Cost%20of%20Cash/CostofCashStudyFinal .pdf

[7] http://www.prnewswire.com/news-releases/3q2011global-mobile-payment-market-forecast-2009---2015-

global-mobile-payments-users-to-hit-893-million-in-2015with-945-billion-in-transaction-value-131969918.html

[8] Jeroen de Bel and Monica Gâza, Mobile payments 2012, ISBN: 978-94-90587-00-0, pp 12

[9] Jeroen de Bel and Monica Gâza, Mobile payments 2012, ISBN: 978-94-90587-00-0, pp 89

[10] ITU World Telecommunication /ICT Indicators database, http://www.itu.int/

[11] S. Karnouskos. Mobile payment: A journey through existing procedures and standardization initiatives, IEEE Communications, Surveys and Tutorials 6(4)44–66, 2004.

[12] Swift: Mobile payments Three winning strategies for banks.

[13] Y. Liu, X. Cao, and L. Dang Mobile Payment, ISN National Key Lab, Xidian University, P.R. China

ANALYSIS AND COMPARISON OF THE TRANSPORT SITUATION IN NORWAY AND IN THE CZECH REPUBLIC

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Abstract: According to the Index of Economic Freedom, conditions for economic development in Norway and in the Czech Republic reach approximately the same values in the zone between "Mostly free" and "Moderately free". This index assesses opportunities for prosperity growth and for more effective achievement of social and economic goals. It is associated with the development of transport and transport infrastructure. The aim of this paper is to compare the structure of transport in selected countries, Norway and the Czech Republic, to describe the differences, and to find out the positive and negative effects of the transport policy in both countries. The article presents the basic documents relating to transport policy of the countries.

Keywords: transport company, transport infrastructure, transport mode, transport policy

1. Introduction

Currently, the Norway has one of the strongest economies in the world, whilst the Czech Economy has been gradually developing within the European Union. However, according to the Index of Economic Freedom (further as IEF), which assesses opportunities for prosperity growth and for more effective achievement of social and economic goals in individual countries, both Norway and the Czech Republic (hereafter as CR) achieve approximately the same values. Partcularly, since 1995, conditions for economic development reach approximately the same values in the zone between "Mostly free" and "Moderately free" (see Figure 1).





The Index covers 10 freedoms – from property rights to entrepreneurship – in 186 countries. At present, CR occupies 26th position (overall score of IEF: 72.2) [1] and Norway ranks the 32nd position (overall score of IEF: 70.9) [1] compared to the other surveyed states. According to Edwin J. Feuler, one of the founders of The Heritage Foundation "the ideals of economic freedom are strongly associated with healthier societies, cleaner environments, greater per capita wealth, human development, democracy, and poverty elimination" [2].

Transport is an important area supporting the infrastructure development and social development in each country. Furthermore, the high-quality transport infrastructure is not only one of the assumptions for meeting the transport needs, but also a means for solution of transport issues. The aim of this paper is to compare the transport structure in selected countries, i.e. Norway and the CR, to describe the differences, and to find out the positive and negative effects of transport policy in both countries.

2. Structure of transport modes in Norway and in the CR

Specific form of transport network (similarly as e.g. in area of settlement or industry) is predisposed by geographical conditions. Characteristics typical for Norway are: harsh climatic conditions, poor soil quality and difficult terrain. On the contrary, Czech geographical conditions are different – mainly because of the fact that CR is approximatelly five times smaller than Norway. Different transport modes in relation to the size of countries and their populations are compared below in the Table 1.

Table 1	l Com	parison	of	indicate	ors of	Norway	and	the	CR
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Indicators 2013	Norway	Czech Republic
Population	5,137,679	10,521,646
Land Area (included fresh water)	385,170 [km ²]	78,867 [km ²]
Roads, total [km]	93,822	130,681
National roads [km]	10,540	7,026
County roads [km]	44,312	48,736
Local roads [km]	38,970	74,919
Total number of road tunnels	more than 1,000	not available
Railway network, total [km]	4,237	15,607
Electrified [km]	2,844	6,926
Double Tracks [km]	245	
Double Tracks and more [km]	-	1,925
Airports with scheduled flights	52	5

Source: [3], [4], [5], [6]

Segment of the rail transport is least developed in Norway. This type of transport is limited by the conditions – the immensity of the country, the low density of population and industry, hardly permeable terrain. This results in high tunnelling and operating costs. Although the total length of railways is 4,237 km, "Double Track Lines" constitute only 245 km (in comparison, the density of the Czech railway network is more than 3.6 times higher, and number of Double (and more)-tracks is almost eight times higher than in Norway). However, 2,844 km (i.e., 67 %) of Norwegian railway network is electrified, whilst in the CR, it is only 6,926 km (44 %).

The road network in Norway has been recently modernized with respect to the environment and transport needs. In mountain areas, particularly on the west coast, new roads and underwater tunnels are being built to provide access to the largest inland islands. The total length of the road network is more than 90,000 km, of which more than 74,900 km are paved, with about 18,200 bridges and 1,700 tunnels (the longest has a length of 24 km) [7].

A typical sign of Norwegian transport is dense passenger shipping. Ferry terminals operate in 35 Norwegian cities.

Norway has historically one of the largest commercial maritime fleet (5th largest superpower – following Greece, Japan, Germany and China). Norwegian share of global maritime commercial transport reached 5 % in 2013 (while the country's population represents 0.1 % of humanity) [7]. Moreover, Norway has extremely strong position especially in the area of oil tankers, chemical tankers and liquefied gas and offshore fleets [7].

The share of transport (and its individual segments) on the GDP of Norway is shown in the Table 2.

Table 2	Transport	share on	GDP	of Norway
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Index of Norway [NOK bill.]	2009	2010	2011	2012	2013
GDP at Market Value	2,382.33	2,544.27	2,750.78	2,908.92	3,011.41
Taxes and Subsidies on Products	261.3	283.6	295.1	308.8	321.8
Gross Value Added at Basic Prices	2,121.0	2,260.6	2,455.7	2,600.1	2,689.6
Transport Totally	106.2	110.7	112.6	109.5	112.8
- via Pipelines	18.3	18.2	15.5	15.2	15.7
- via Ocean Transport	25.1	28.2	29.2	22.0	23.1
 via Other Transport 	62.7	64.3	67.9	72.4	73.9
% of Value Added at Basic Prices [%]	5.0	4.9	4.6	4.2	4.2

Source: Author's work by [3]

The structure of transport in the CR is not different only due to different geographical conditions, but also because of the fact that the CR is an important European traffic junction. For this reason, transport contributes significantly to the Czech economy. In 2013, transport created 11 % share on Gross Value Added of GDP in the CZ (see Table 3), whilst it was only 4 % in Norway (Table 2).

Road and rail transport are the basis of the Czech transport system. The importance of other transport modes (air transport and inland waterways) is low in terms of the volume of traffic and transport performance [5].

The CR is covered with dense road network, and that is why road transport is the most commonly used here. The second most frequently used mode of transport is railway transport. Air transport is used mainly for long distances, and river transport encounters problems with lack of navigable waterways.

Index of CR [CZK bill.]	2009	2010	2011	2012	2013
GDP at Market Value	3,759.00	3,790.90	3,823.40	3,846.60	3,883.80
Taxes and Subsidies on Products	368.7	370.6	378.9	394.9	419.6
Gross Value Added at Basic Prices	3,390.2	3,420.3	3,444.5	3,451.7	3,464.1
Transport, Communi- cation	391.7	393.8	384.5	390.5	380.5
% of Value Added at Basic Prices [%]	11.6	11.5	11.2	11.3	11.0

Table 3 Transport share on GDP of the CR

Source: Author's work by [5]

3. Comparison of Norwegian and Czech enterprise structure in the area of transport

Classification of Economic Activities CZ-NACE, Section H – Transportation and storage, was used to monitor the differences between the studied countries in the field of transport. It includes "the provision of passenger or freight transport, whether scheduled or not, by rail, pipeline, road, water or air and associated activities such as terminal and parking facilities, cargo handling, storage etc. Included in this section is the renting of transport equipment with driver or operator. Also included are postal and courier activities" [8].

Table 4 Comparison of Norwegian and Czech enterprise structure in the area of Transportation and Storage according to CZ-NACE classification

		49 Land Transport, Pipeline Transport	50 Water Transport	51 Air transport	52 Support Activities for Transportation	53 Postal and Courier Activities	49 - 53 Transport and Storage
2007	NO	16,852	1,778	99	2,228	1,202	22,159
2007	CZ	34,617	85	33	4,061	448	39,244
2008	NO	16,843	1,713	93	2,226	1,308	22,183
2008	CZ	34,523	87	32	4,231	472	39,345
2000	NO	16,531	1,729	96	2,223	1,251	21,830
2009	CZ	34,400	99	41	4,523	487	39,550
2010	NO	16,187	1,722	91	2,250	1,278	21,528

	CZ	33,956	96	45	4,786	458	39,341
2011	NO	16,172	1,704	91	2,267	1,372	21,606
2011	CZ	33,410	97	55	5,130	411	39,103
2012	NO	16,042	1,713	85	2,305	1,456	21,601
2012	CZ	32,680	94	67	5,520	337	38,698

Numbers are estimated due to interleaved trend curves, 2nd degree polynomial

Source: Author's work by [3], [9]

Data in the Table 4 and in the Figure 2 show the unequal use of transport modes in the surveyed countries.





4. Positives and negatives of Norwegian transport in relation to transport policy

Transport policy is in conformity with the objectives relating to the traffic flow and regional development, transport safety, environment and universal design. The strategic objectives of the previous plan "National Transport Plan 2010-2019" were met in the areas [4]:

- "travel time reduction on the national road network,
- increased punctuality and regularity for trains,
- improved traffic flow for local public transport and better infrastructure for cyclist and pedestrians,
- *better traffic safety on the roads,*
- better safety at sea and facilitation to enable ports to become intermodal hubs,
- a more universally designed and accessible transport system".

In addition, we can see the growing trend in investment operations, maintenance and development of transport infrastructure (e.g. according to plans of government, investment level for railway transportation should increase by more than 50 % in 2014 compared to 2013) [4].

In contrast, we can consider the following to be negative: [4]

 high transport and logistics costs of industry due to dispersed settlement and long distances,

- low credibility and legitimacy of road toll collection among road users (approx. 70 toll road projects are organized in 60 toll road companies in Norway), low efficiency, low complexity of fare systems and discount schemes, missing principles for road toll collection from government,
- population growth requires significantly higher capacity in the transport system (e.g. railway capacity isn't enable to meet the demand for transport around major cities, lack of high-standard main corridors and double tracks),
- high fees and tolls on selected national roads cause a shift of traffic on county roads, however, the condition of the county road network is poor in many places,
- goods road transport is still the most used mode of transport, truck transport contributes to the growth of negative externalities of transport (lack use of goods transportation by sea and rail),
- narrow roads and the low road capacity in rural areas,
- IC railway system doesn't meet the requirements of passengers, transport system with poor frequencies,
- high travel times and distance costs between regions,
- lack of bus stops on the national road network and public transport hubs,
- incomplete and insufficiently formed infrastructure for pedestrians and cyclists [4].

5. Positives and negatives of Czech transport in relation to transport policy

In the CR, the positive facts are as follow:

- the abolition of border customs control after joining the EU – resulting in improvement of conditions especially for road freight transport, its fluidity and speed,
- growth in demand for road freight due to large proportion of commercial links with neighbouring EU member countries,
- elements of cooperation in transport rail and water transport can be used as a service for road carriers,
- gradually improving transport services,
- the air transport market shows greater potential for development than in other European countries,
- minimum of foreign competition in the rail transport market,
- development of integrated transport systems based on the interconnection of all transport modes throughout the region (in some regions of the CR).

However, the following problems still exist:

- uneven growth of performance in the various modes of transport and deepening disparities in the modal split in the CR,
- the estimated cost for the construction and modernization of all types of transport networks greatly exceed the financial capacity /allocation in the field of transport,
- incomplete connection of all regions on the quality road and highway network, the upgraded rail network and the international airport, incomplete connection of the CR to the European network of waterways,

- urban transport is not solved systematically, measures calming the inner cities are implemented poorly (including the creation of conditions for cycling and walking),
- the decline in labour productivity; cheap skilled labour force, the extant relative advantage of the CZ, has been gradually decreasing,
- increased competitive pressure on carriers from countries with lower costs in international road transport, including the so-called "social dumping",
- full liberalization of the air transport market in the EU has increased competition of individual airlines,
- comparative advantage of water transport is used rarely; its function in the transport market (i.e. reduction of transport prices) is not utilized.

6. Strategic documents in the field of transport in Norway and in the CR

As an EU member state, the CR is bound by EU obligations. New European transport policy for the period 2012-2020 with a view to 2050, called White Paper includes 40 concrete initiatives to build a competitive transport system in the next decade. The main objectives are: to reduce Europe's dependence on imported oil dramatically and to cut carbon emissions by 60 % by 2050, to stop using conventional drive in cities, to use 40 % of low carbon fuels in aviation , to cut shipping emissions by 40 %. It can be achieved by:

- relocation of 50 % road cargo transport of medium and long distances to rail and water transport; significantly increase the share of rail transport in the area of passenger transport (including also transfer of passengers from air transport for distances up to 1,000 km – it would make more capacity in airspace for longdistance flights),
- the introduction of alternative energy for transportation,
- the introduction of more efficient engines,
- applications of ITS systems across all transport modes in order to optimize traffic and transport processes.

The theme of White Paper is further elaborated in Policy of Trans-European Transport Networks (TEN-T).

In Norway, the current strategy document (white paper) for development of a modern transport system in Norway is called National Transport Plan 2014-2023 (next as NTP 2014-2023). This comprehensive plan is produced every four years and sets for the Government's transport policy goals and strategies for the next ten years [4]. National Transport Plan 2014-2023 is similar to Czech Transportation Policy 2014-2020.

The starting point of NTP 2014-2023 is to create such a transport system that limits its environmental impact and helps Norway's transition to low-carbon society. Guidelines for the development of the transport system are set out in the white paper Norwegian Climate Policy, which is *"fundament for a broad political Agreement on the climate challenge – known as the Climate Agreement"* [4]. Next, *"the National Transport Plan 2014–2023 includes a National Cycling Strategy and a new National Walking Strategy in its planning proposal for 2014–2023.*

A white paper on public health strategies (2012–2014) stressing the importance of cross-sectoral work on physical activity and more environmentally and healthfriendly transport and transport systems, including walkable neighbourhoods, provides further support" [10]. "The government of Norway is also committed to participate in partnerships to promote the development of cross-border transport. Norway participates in the EU TEN-T through the European Economic Area Agreement (EEA Agreement), the Northern Dimension Partnership for Transport and Logistic (NDPTL) and the Barents Euro-Arctic Transport Area (BEATA)" [4].

7. Conclusions

In Norway, the transport share on GDP was 4 % in 2013, while it was 11 % at the same time in the CR. Moreover, the CR is an important European traffic junction. Personal transportation by ship is a typical feature of Norway. On the contrary, road and rail transport create basis of the transport system in the CR. The numbers of enterprises confirm the unequal usage of transport modes in the surveyed countries.

Additionally, Norwegian companies divide their business interests between the water, postal and supportive activities evenly, whilst in the CR, there predominate those enterprises which are engaged in land transport and which support services for transportation.

Comparison of positives and negatives has shown number of identical problems in the area of transportation in both countries. This can be observed also in the strategic documents for the next strategic period which are very similar for both countries, despite the different structure of transport and transport networks.

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References

[1] http://www.heritage.org/index/visualize?countries=nor way|czechrepublic&src=ranking

[2] http://www.heritage.org/index/about

[3] http://www.ssb.no/

[4] http://www.regjeringen.no/pages/38429132/PDFS/ST M201220130026000EN_PDFS.pdf

[5] https://www.sydos.cz/cs/rocenka-2013/index.html

[6] http://www.mdcr.cz/cs/default.htm

[7] http://www.businessinfo.cz/cs/clanky/norsko-

ekonomicka-charakteristika-zeme-18919.html#sec7

[8] http://notes.czso.cz/csu/klasifik.nsf/i/klasifikace_ekono

mickych_cinnosti_%28cz_nace%29

[9] http://www.czso.cz/

[10] http://www.euro.who.int/__data/assets/pdf_file/0010/ 247168/Developing-national-action-plans-on-transport,health-and-environment.pdf

THE MEASUREMENT OF REGIONAL DISPRITIES IN SELECTED REGIONS OF THE CZECH REPUBLIC

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Abstract: One of the main objectives of the European Union is decreasing of the differences (disparities) between European Union's regions. The employment, unemployment, GDP, etc. belong to constantly monitored disparities. This paper is devoted to sometimes a little neglected disparities namely those in the social sphere. The aim of the paper is to measure regional disparities in the social sphere by two integrated indicators (health condition and social facilities) and point methods. The results of the measurements will be compared with the calculated location quotients in selected sectors of employment in the sector of social and health care.

Keywords: regional disparities, point method, localization quotient, integrated indicator

1. Introduction

The European Union (EU) under the objective Cohesion emphasizes balanced development that reduces differences (disparities) between the regions. Despite of the EU efforts to continuously reduce disparities between regions, there are still significant differences between them.

This paper is devoted to the issue of above mentioned regional disparities in the social sphere. For the measuring there will be used integrated indicators "health condition" and "social facilities". The measuring will be done in three regions of the Czech Republic (CR) - the Hradec Králové Region (HKR), the Pardubice Region (PR) and the Moravian-Silesian Region (MSR). These regions were chosen because Hradec Králové and Pardubice Regions are known as the regions "good for life" and the Moravian-Silesian Region is contrast to them. The first two regions often win in some competition as the best places for life. The Moravian-Silesian Region belongs to the "worst" regions of the CR. There is high unemployment, low level of education, high migration, high criminality etc. In this paper there are determined disparities in the social sphere in relation to sector's specialization. The sector's specialization could be determined by a localization quotient. The localization quotient for employing in the sector of social and health care will be calculated. We would like to find out whether in the places, where the social facilities and health condition are good, the specialization in this sector is high.

2. Theoretic background and methodology

These chapter is devoted to the theoretic background of the regional disparities, the point method and location quotient.

2.1 Regional disparities

Regional disparities primarily help the citizens to raise awareness of the region and their position relative to other regions. Due to them it is possible to determine the differences between entities of the regions, their performance, structure, activities, etc. The focus here is primarily on what the total level of regions is and what the region offers for the living conditions of its inhabitants namely from the social, economic and environmental point of view [3].

For the analysis of regional disparities a limited number of indicators are selected into the areas that economic, social and territorial particular groups include:

- in economic indicators,
- in social indicators,
- and in the territorial.

Kutscheraurer [4] defined the second level of classification of social sphere as: inhabitants, social facilities and social pathology. For the measuring of the regional disparities we used two integrated indicator from social sphere – the health condition and the social facilities. These indicators consist of these descriptors:

- **Health condition**: life expectancy at birth (male), life expectancy at birth (female), the average percentage of incapacity, the incidence of neoplasm per 100 thousand inhabitants.
- Social facilities: number of doctors per 10 thousands inhabitants, number of hospital beds per 10 thousand inhabitants, number of places in social care organizations per 10 thousand inhabitants, number of leisure centres for children and youth per 10 thousand inhabitants [2].

For the measuring of the regional disparities we do not use the descriptor number of leisure centres for children and youth per 10 thousand inhabitants because the data of these descriptors are not available.

2.2 Point method

The point method is one way of measuring of regional disparities. M. K. Bennet is the author of the point method. One advantage of the point method is its ability to summarize characteristics captured in different units of measurement in one synthetic characteristic. The result is a dimensionless number that does not possess a real sense, but it can be used either to determine the rank of the regions or to determine the regional differences that are associated with different categories of indicators. Specific form for using the point method is to determine the

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economic value of the index of regional disparities using weighted average of points (1) that each region will receive for the relevant indicators.

$$EI_{RD} = \frac{1}{p} \sum_{i=1}^{p} \frac{x_{ij}}{x_{imax}}, resp. \frac{x_{imin}}{x_{ij}}$$
(1)

Where, x_{ij} represents the i^{th} variable for the j^{th} region, x_{max} represents the maximum value of the i^{th} indicator, x_{min} –represents the minimum value of the i^{th} indicator [9].

2.3 Location quotient

Location quotient (LQ) is a technique that allows for the comparison of local area characteristics such as employment rates to the national characteristics [7]. This technique has been widely used by economic geographers and regional economist since 1940 [5].

A location quotient is a way of measuring the relative contribution of one specific area to the whole for a given outcome. Let x_i and n_i denote the outcome and population size of the ith are, respectively. The location quotient for the ith area is defined in this equation (2).

$$lq_i = \frac{\frac{x_i}{n_i}}{\frac{x}{n}} = \frac{r_i}{r}$$
(2)

where $r \neq 0$. Here r_i and r are dependent rates therefore lq_i is the ratio of two dependent random variables [6].

In this paper we used location quotient for specialization in the sector – social and health care. According Stejskal and Kovárník [8]is used the edited equation (3).

$$lq_i = \frac{\frac{z_i}{z}}{\frac{Z_i}{z}}$$
(3)

Where z_i – the number of employees in the sector i^{th} in the region,

z – the number of employees in the region,

 Z_i – the total number of employees in the sector i^{th} in the higher level,

Z – the total number of employees in the higher level.

The value of lq higher than 1 is pointing out the specialization in the sector *i* in the region, i.e. in this sector there are employed more workforce than on the higher level (in our case in the Czech Republic).

3. Measuring of regional disparities and location quotient

For the next analysis will be used data by the Czech Statistical Office (CSO) from 2011. More recent data was not available for all descriptors. Only for special descriptor the incidence of neoplasm per 100 thousand inhabitants we had to use data from the year 2010. All the calculations were done in Microsoft Excel 2007 according to the point method and localization quotient.

3.1 Data of regional disparities

Table 1 shows the values of descriptors of social facilities. The Hradec Králové Regions is the best in two of the descriptors especially in the number of hospital beds per 10 thousand inhabitants which is higher than in other regions. The worst situation is in the Pardubice Region in all descriptors. We expected that the worst situation in social facilities would be in the Moravian-Silesian Region, but it was not.

 Table 1 Social facilities in 2011(Source: Own proceeding according data by CSO)

Social facilities	HKR	PR	MSR
Number of doctors per 10 thousands	44.02	28.01	20.04
inhabitants	44,93	36,91	39,94
Number of hospital beds per 10 thousand	62 56	50.04	51.05
inhabitants	02,50	50,04	51,05
Number of places in social care			
organizations per 10 thousand	75,25	78,60	82,22
inhabitants			

Table 2 represents values of indicator the health condition. The best situation is again in the Hradec Králové Region but now only in two descriptors – life expectancy at birth (male) and life expectancy at birth (female). In this indicator the worst social situation was in the Moravian-Silesian Region, which had the worst values for three descriptors apart from the incidence of neoplasm per 100 thousand inhabitants.

 Table 2 Health condition in 2011(Source: Own proceeding according data by CSO)

Health condition	HKR	PR	MSR
Life expectancy at birth (male)	75.47	74.84	72.71
Life expectancy at birth (female)	81.33	80.34	79.86
The average percentage of incapacity	3.63	3.14	4.26
The incidence of neoplasm per 100 thousand inhabitants	573.40	501.20	511.30

3.2 Rank according calculation

For measuring regional disparities there was used the point method. In the first step it was necessary to divide those indicators for which the optimal value is called value of the maximum and for which the optimal value is called the minimum value. Furthermore, there was calculated the maximum (for number of doctors, number of hospital beds, number of places in social care organization, life expectancy) and minimum (the average of percentage of incapacity, the incidence of neoplasm) value in all regions. Finally there was formed converted table, where in the case of the minimum values there was divided the criterial value by the actual value, and this proportion was multiplied by the 1000. In the case of the maximum values there was divided the actual value by the criterial value and the percentage multiplied by the 1000 (see Tab. 3 for social facilities and Tab. 4 for health condition).

 Table 3 Max values – Social facilities. (Source: Author's calculations.)

Social facilities	HKR	PR	MSR
Number of doctors per 10 thousands inhabitants	1000	866	889
Number of hospital beds per 10 thousand inhabitants	1000	800	816
Number of places in social care organizations per 10 thousand inhabitants	915	956	1000

 Table 4 Max values – Social facilities. (Source: Author's calculations.)

Health condition	HKR	PR	MSR
Life expectancy at birth (male)	1000	992	963
Life expectancy at birth (women)	1000	988	982
The average percentage of incapacity	867	1000	737
The incidence of neoplasm per 100 thousand inhabitants	874	1000	980

Tab. 5 and Tab. 6 show the average values which could be described as an index of regional disparities. These values were calculated by averaging the values mentioned in the tables 3 and 4. On the basis of the average values there were established ranks of the regions. According to the Tab. 5 we can see that the Hradec Králové Region is the best region in the social facilities. In contrast, the Pardubice Region is the worst region in the social facilities.

 Table 5 Rankings of regions – Social facilities. (Source:

 Author's calculations.)

Social facilities	HKR	PR	MSR
The average values of social facilities	972	874	902
Rankings of regions	1	3	2

Tab. 6 shows the rankings of regions in health condition. The Pardubice Region is now the best region and the Moravian-Silesian Region is the worst. In the average of both of these indicators the best region is the Hradec Králové Region and the worst the Moravian-Silesian Region.

Table 6 Rankings of regions – Health condition. (Source: Author's calculations.)

Health condition	HKR	PR	MSR
The average values of health			
condition	935	995	916
Rankings of regions	2	1	3

3.3 Location quotient

We calculated the localization quotient for employment in the sector of social and health care. For our calculation we used the data from the Tab. 7.

Table 7	' Employment in the 1	regions (Source	e: Own
	proceeding acc	cording data by	y CSO)

	HKR	PR	MSR
Number of employees in social and			
health care in the region	18.67	15.82	39.50
Total number of employees in the			
region	252.19	238.31	540.70
Total number of employees in			
social and health care in the CR	324.80	324.80	324.80
Total number of employees in the			
CR	4872.41	4872.41	4872.41

Table 8 shows the results of the localization quotient. If the value of the localization quotient is higher than 1, the specialization in the sector of social and health care is in the region higher than in the CR. We expected that if the social facilities and health conditions are good, the specialization in this sector is high. The best situation was in the Hradec Králové Region and the LQ – HRK was 1.11 (more than 1 – higher specialization). In contrast to that, the worst situation in social facilities and health care (average of both of them) was in the Moravian-Silesian Region. The LQ – MSR was 1.096. It was lower specialization than in the Hradec Králové Region but higher than in the CR.

Table 8 Results of LQ. (Source: Author's calculations.)

LQ - HKR	1.111
LQ - PR	0.996
LQ - MSR	1.096

6. Conclusions

The EU under the objective Cohesion emphasizes the balanced development that reduces differences between the regions. This paper dealt with the differences in social sphere by using integrated indicators namely health condition and social facilities.

The aim of this paper was measuring the regional disparities in social sphere in the three regions of the Czech Republic namely Hradec Kralové Region, Pardubice Region and Moravian-Silesian Region. The measuring was performed using the point method. On the base of the point method there was determined the rank of the region. The Hradec Králové Region had the best ranking in the integrated indicator of social facilities and on the second place in the indicator health condition. Its average was the best of all. The Pardubice Region was on the third place in the indicator of social facilities and on the first place in the indicator of health condition. Its average value was on the second place. The Moravian-Silesian Region belongs to the very problematic regions and this analysis confirmed it. The average values were the worst.

And the end of this paper we devoted to the localization quotient. The location quotient is a technique that allows for the comparison of local area characteristics such as employment rates to the national characteristics. We used this quotient for measuring sector's specialization in employment in the social and health care. We expected that if the social facilities and health conditions are good, the specialization in this sector is high. The best situation was in the Hradec Králové Region and the LQ – HRK was 1.11. In contrast to that, the worst situation in the social facilities and health care (average of both of them) was in the Moravian-Silesian Region. The LQ – MSR was 1.096. It was lower specialization than in the Hradec Králové Region but higher than in the CR. We expected higher differences in the sector's specialization between the Hradec Králové Region and the Moravian-Silesian Region. Our expectation was that the values of LQ – MRS would be under the 1.

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References

[1]CSO. *Regional time series*. [online]. [10.10.2014] Available from: http://www.czso.cz/csu/redakce.nsf/i/re gionalni_casove_rady.

[2] Fachinelli, H., Tománek, P. Hodnocení regionálních disparit prostřednictvím integrovaných indikátorů. Regionální disparity. Electronic journal, 2011, pp. 31-44.

[3] Hučka, M., Kutscheraurer, A., *Teoreticko-metodické* otázky regionálních disparit. Regionální disparity. Electronic newspaper., 2011, pp. 20-30.

[4] Kutscheraurer, A., Fachinelli D., Sucháček, J., Skokan, K, Hučka, M, Tuleja, P., Tománek, P., 2010. Regionální disparity. Disparity v regionálním rozvoji země – pojetí, teroie, identifikace a hodnocení. Ostrava: EkF VŠB-TU. Research project No. WD-55-07-1, 2010, pp. 175-177.

[5] Miller, M.M., L.J. Gibson, and N.G. Wright, Location Quotient: *A Basic Tool for Economic Development Analysis*. Economic Development Review 9(2), pp. 65-68, 1991.

[6] Moineddin, R., Beyene, J., Boyle E., *On the Location Quotient Confidence Interval*. Vol. 35, No. 3, The Ohio State University, 2003.

[7] Robinson, G.M., *Methods* α *Techniques in Human Geography*. Toronto: John Wiley α Sons, 1998.

[8] Stejskal J., Kovárník J., *Regionální politika a její nástroje*. Prague, Portál, s.r.o., 2009, pp. 170-171.

[9] Tuleja, P., 2011. Možnosti měření regionálních disparit
nový pohled. Regionální disparity: Working Papers No. 5, 2009.

RATIONALE FOR CORPORATE MERGERS AND ACQUISITIONS

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Abstract: The aim of this paper is to present the most relevant reasons for corporate mergers and acquisitions. Authors firstly introduce the paper and the topic for readers, subsequently they focus on different rationales behind the corporate combinations from economies of scale and scope to tax loss carry forward and last but not least they present the adequacy of merger control from the competition law perspective.

Keywords: mergers and acquisitions, profit increase, economies of scale, merger control, competition

1. Introduction

Mergers and acquisitions take place for many strategic business reasons in the business world. The key ideas for any business combination are economic at their core, thus by buying a company to increase shareholder value above that of the sum of the two companies in the period preceding the merger. According to Kokkoris there are two ways how companies can grow, hence organically and inorganically. [1] Organically means that the company continually, over the time, develops its B2B or B2C relationships that may result is higher demand, increase of sales or broadening of customer base. On the other hand, companies willing to accelerate their business immediately go for inorganic growth, clearly represented by mergers and acquisitions.

The aim of any business in a capitalist society is to maximize shareholder wealth and acquiring a company that helps to accomplish that goal is considered as a successful mean. This is the very broad financial definition of why companies merge at all. However the aim of this paper is to focus on several, according to authors most relevant, reasons behind the merger policy of each individual company.

2. Economies of scale and scope

An important financial reason often given for mergers is economies of scale and scope. Economies of scope can be described as cost savings emerging due to increasing number of different goods produced. The idea highlights the fact that a joint product of a single (e.g. merged) firm is greater that two single products of two single companies. Economies of scale refer to the cost optimization resulting from the expansion. It simply means that the corporation will produce goods at its lowest marginal costs where it is able to operate at the minimum efficient scale. [2] In other words company operating on a smaller scale that the above mentioned, incurs higher marginal costs and loss of allocative efficiency. In this connection, several factors cause that an average cost per unit decreases as the scale of input increases. Such an argumentation supports the rationale of merger.

According to Whish economies of scale may be:

Product - specific resulting in cheaper product produced;

- *Plant specific* focusing on the use of multi-product plant;
- *Firm specific* incurring lower overall costs. [2]

The idea of economies of scale and scope in a nutshell is that if the cost of doing business decreases, it will be subsequently passed on to the consumer resulting in a mutual win-win situation.

Kokkoris in this respect explains that 'economies of scale refer to efficiencies associated with increasing or decreasing the scale of production and refer to changes in the output of a single product type. Economies of scope refer to efficiencies associated with increasing or decreasing the scope of marketing and distribution and to changes in the number of different types of products.' [1]

3. Diversification

Mergers sometimes occur because firms want to achieve diversification. In our opinion diversification seeks to reduce the risk through successful investment decisions. If a large conglomerate corporation is of an opinion that it is widely exposed to risk because it has invested vast majority of its business capital in one particular industry, it may decide to expand and buy a business in another sector of industry. That would provide a measure of diversification for the acquiring firm. However, even though diversification is a usually considered as an influential factor, business firms may merge for many other reasons regarding diversification.

In our diverse economic and political surrounding, companies may be able to reduce risk by merging with firms in other countries. This gives the benefit of reducing foreign exchange risk and localized recessions. We have to look carefully at diversification as a motive for mergers and acquisitions and make sure that it really does maximize the wealth of the shareholder as there is evidence to the contrary, hence imagine the problems in production the company might face by e.g. entering a completely new sector of business.

4. Management efficiency

In respect of management efficiency two completely different points of view should be discussed. On the one hand, it is very interesting to come to the conclusion that sometimes the explanation for some mergers is that one firm competes to run another [2] The fear of successful takeover bid motivates existing management to ensure that all functions and systems of the company are effective. It is very obvious that in case that the management's performance is satisfactory, shareholders are not likely to sell their shares unless it is overbidding (in some cases). We can conclude that management efficiency increases in order to prevent merger or acquisition of the firm by another firm.

On the other hand, mergers and acquisition can sometimes stimulate the efficiency of two or more firms, in cases when a new regime would be capable of generating greater profits than the existing ones. [2] Moreover, duplication of functions such as accounting, purchasing, and marketing within each subject may be eliminated to the benefit of the merged firm.

Business functions are relatively expensive for small companies and therefore the merged firm will more likely be able to afford the necessary activities of a going concern. Subsequently, larger business firms may have better access to sources of financing in the capital markets than smaller firms. The expansion that results because of merger may enable the recently enlarged firm to access debt and equity financing that had formerly been beyond its reach. Furthermore, improved financing is another motive for merger. If a company is in trouble financially, it may look for another company to acquire it. The alternative may be to go out of business or take bankruptcy.

5. National champions

One of the goals of national or European strategic industrial policy is the desire to increase the scale of national or European companies. [2] As mergers usually influence and affect the structure of a market, it is crucial for companies to carve out their own place in the marker structure. Also, it may up to governments to encourage mergers that will create larger domestic firms. The main insight of this chapter is the idea of shifting profits from foreign to domestic via the notion of national champion. This means that a national government may subsidize output of the domestic corporation by reducing its costs. This move allows the corporation to behave more aggressively in international markets as it may increase its market share to the disadvantage of foreign rivals and subsequently raise national welfare. [6]

However, despite the almost ideal scenario described above, there are several points that have to be taken into account. Firstly, if more governments used subsidies at the same time, all firms may increase their outputs in international markets and their profits would decrease. Secondly, the notion of national champion is very politically sensitive. It may happen that certain firms knowing that a government is willing to subsidize certain sector would end up behaving rent-seeking. On the whole it is not evident that the government always supports the right firms and not only distributes aid to those which have more political connections. [6]

6. Tax advantages

Some other elements may force one company to merge with another company and thus e.g. tax advantages associated; specifically a tax loss carry-forward. In case that one of the firms involved in the merger has previously sustained losses, they can be offset against the tax liability of the firm that it has merged with based on the local tax legislation. In our opinion, this is clearly a mutual benefit to the newly merged entity. However, it should be noted that such a decision is only valuable if the financial forecasts for the acquiring firm indicate that there will be operating gains in the future that will make this tax tool worthwhile.

For example in Slovakia the Amendment to the Income Tax Act effective as of 1 January 2014 reduces the period during which tax losses can be carried forward from seven years to maximum four consecutive tax periods. In addition, the amount that is deductible in a year is limited to one quarter of the tax loss sustained. The change of rules retrospectively applies to existing tax losses (from tax periods ending in 2010 to 2013) which were not utilized in the 2013 tax period. The cumulative amount of tax losses incurred in tax periods ending after 31 December 2009, but before 1 January 2014 that is carried over to 2014 should still be utilizable, but only within four consecutive tax periods, starting from the tax period that begins 1 January 2014 onwards and only up to the one quarter of total cumulated amount per tax period.

7. International aspects of mergers

For the purpose of this paper, last but not least, there are several tendencies for companies to merge the base of which is international. The globalization of markets and technical development in the recent period has brought opportunities to grow in larger geographical markets. And various influential factors support the reasoning of international growth. Firstly, if the company reached saturation because of the fact that the domestic market is too small, usually it seeks international environment. Moreover, expanding overseas allows mid-size corporation either to increase their ability to compete or their overall capacity. Secondly cash flow surplus would hardly be invested in an economy that does not grow fast enough.

8. Necessity of merger regulation

All of the above mentioned reasons for corporate mergers are applied by companies on a daily basis. However, "business freedom" should be limited to the point it violates the freedom of other subjects on the market. Merger regulation is an important tool to prevent the effective competition ex ante. It is not only on the national level that competition authorities seek to sustain the effective competition between competitors on the relevant market. The ever rising number of completed mergers notified before e.g. the European Commission is reflecting the importance of their legislative control in European Union jurisdiction. The main objective of merger laws is to restrain such mergers and firm acquisitions that may have any adverse effects on competition and to sustain the competition of the post-merger market. Merger control is applied in the public interest, rather than to protect the individual shareholder's interests, which are covered by company laws.

In order to give the complete overview of merger regulation and its justification, it is necessary to distinguish between different types of mergers and thus the horizontal, vertical and conglomerate mergers. [1] All of them differ and may have completely different influence on the market. Horizontal mergers are mergers between firms occupying the same distribution-chain level. The market power of merging firms might rise, which could lead into a profitable post-merger price increase. If the competing firms react by raising their prices, the rivalry might be weakened. Moreover, the collusion between remaining firms might occur as another consequence of horizontal mergers. Vertical mergers are mergers between firms from distinct industry levels. Even though very often pro-competitive, under certain circumstances might the vertical merger induce constraints to entry or market foreclosure, as well as raise the probability of collusion. Conglomerate mergers are mergers between firms with no connection to each other, in apparently unrelated markets. Potentially harmful effect might arise from a so-called portfolio power. The firm possess 'portfolio power' when the market power of the whole portfolio of brands exceeds the sum of its individual parts. Thus the post-merger market power might be utilized more effectively, thereby damping the competition.

The first legal action on the European level taken to ensure the competitive market environment was the adoption of Regulation no. 4064/89 from 1989. Since then juridical instrument controlling the market reorganization caused by mergers has existed. In order to estimate the likelihood of merger's detrimental effects, competition authorities need to apply a legal substantive test. The new Regulation no. 139/2004 adopted on 1 May 2004 reformulates the substantive test as follows: "A concentration which would significantly impede effective competition, in particular by the creation or strengthening of a dominant position, in the common market or in a substantial part of it shall be declared incompatible with the common market." Nowadays, the Substantial Impediment to Effective Competition (SIEC) test is carried out for the assessment of mergers. In Slovakia this test has been introduced since 2012.

One should be aware of fact that all mergers that fall within the scope of national or European competition legislation must be assessed prior to their implementation in order to determine their possible advert impact on the competition. The majority of mergers assessed by the European Commission have been cleared already in the first phase of merger assessment, however a small part of it with commitments. Only a very few cases have been cleared in the second phase, similarly to first phase, some of them with commitments. The remaining minor number of cases screened by the European Commission has been prohibited. The description above is provided in the form of a comprehensive chart in Figure 1. [1]



Figure 1: Phases

4. Conclusions

Although the number and volume of mergers broke records at the beginning of the 21st century, it should be noted that these transactions are not just a recent phenomenon. As described above, companies make different business decisions for a long list of reasons. Some of these reasons can be later successful, in that the motivation for the transaction is to maximize shareholder value. Unfortunately, there are also other reasons that are more questionable.

On the whole companies pursue an acquisition only if it creates value. That means, if the value of the acquirer and the target is greater if they operate as a merged entity than as separate ones. It depends on every single business entity, its future prospects and subsequent consequences whether merger or acquisition is justified. Usually they all take effort to find synergies associated with the transaction that would help them to acquire comparative advantage in comparison to others.

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References

[1] Kokkoris Joanis; Shelanski Howard, *EU Merger Control – A Legal and Economic Analysis*, Oxford, Oxford University Press, 2014,

[2] Whish Richard; Bailey David, *Competition Law*, Oxford, Oxford University Press, 2012

[3] Jones Alison; Sufrin Brenda, *EU Competition Law*, Oxford, Oxford University Press, 2014

[4] COUNCIL REGULATION (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings; [online] http://eur-lex.europa.eu/legalcontent/EN/ALL/;ELX_SESSIONID=S0pyJFFpbRVZ6Sh h8n3TGpr2hdxw1MQcjmJ2lblWYJblw1fjLnQh!-811546712?uri=CELEX:32004R0139 [5] COUNCIL REGULATION (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings; [online]

http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CE LEX:31989R4064:EN:HTML

[6] Motta, Massimo; Ruta Michele, *Mergers and National Champions*, CESifo Conference Centre, 2007 [online] https://www.cesifogroup.de/portal/pls/portal/!PORTAL.w wpob_page.show?_docname=987850.PDF

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ANALYSIS OF THE CAUSES OF INADEQUATE BUILDING AIRTIGHTNESS

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Abstract: The subject of the paper is a description and analysis of the determinative factors affecting the airtightness of energy-efficient buildings. The quality of airtight building envelope except for low energy consumption also minimizes the risk of damage to the structure associated with the spread of the heat and water vapor in the structure. The objective is to define and analyze relevant factors influencing the airtightness of buildings using analytical methods. It is necessary to pay attention to the determinative factors in whole process of building of airtightness. Carefully and thoroughly conducted analysis provides information and recommendations for improving the quality and limitations of errors.

Keywords: Energy efficient buildings, airtightness, air permeability, energy performance

1. Introduction

According to the current trend of reducing energy consumption, it is necessary to define and determine the key factors in terms of airtightness of the building envelope. The reduction of energy consumption leads to individual savings of individuals, but also it brings the whole society positive externalities in the form of support for the principles of sustainable development.

Airtightness is characterised by air leakage through the external wall and it is a key component of energy efficient buildings. Undesirable and uncontrolled leakage of air from the inside through the building envelope to the outside will reduce efficiency of the thermal insulation, reduce heat resistance of the structure and increase losses by ventilation. The increased losses by ventilation directly increase the heat demand for heating purposes, in some cases up to 10%. High consumption of energy for operation negatively influences economy. To achieve low air permeability of the building envelope is required careful design, careful realization and, of course continuous control. If the envelope is not airtight enough, the energy demand will increase and there will be also a risk that the envelope structure will degrade and shorten its service life. The pressure difference causes the moist air to leak from the inside through joints and untightness into the envelopment structure, which may, in turn, result in water vapours condensing and fungal growth. [1]

2. Cause and Effect Diagram

The aim of the Cause and Effect Diagram is to obtain a comprehensive and coherent view of the most probable causes of the solved problem. The Cause and Effect Diagram has been described and implemented by Kaoru Ishikawa in 60's of the last century. According to him, it is also sometimes called as the Ishikawa diagram. The graphic processing of diagram reminds a fish bone. The Cause and Effect Diagram are among the methods of analysis of the essential (roots) causes of risks. The whole principle of cause and effect analysis is based on the axiom that every result (problem) has a cause or combination of causes. The result of Ishikawa diagram is not solving the problem, but only arranging of listed potential causes, effects and impacts. [2-4]

The principle of Ishikawa diagram is very simple and easy. The head of the fish bone represents a consequence or a problem. The main categories of causes are linked to spine bone. There are countless variants to categorize of causes. The most commonly used classification of causes is called 6M. Furthermore, there are very often used categorization causes identified as 4P, 8P, 4S, 3M&P. The names of categorization of the causes are referred by the first letters of those categories. The categorization of the causes called as 6M divides the causes into 6 basic general categories: Machine, Method, Materials, Measurement, Man and Mother nature. The figure 1 illustrates the scheme of Ishikawa diagram according to the categorization of causes 6M. [2-4]



Figure 1: Scheme of Ishikawa diagram

Group sessions (brainstorming) is a suitable method for defining potential and significant impacts and causes. Each of defined causes, effects or impacts must be properly classified in correct main category of causes. The causes can be further divided (sub-causes). The gradual categorization forms characteristic the fish bone. [4]

2.2 The Causes of Inadequate Building Airtightness

The actually solved problem is inadequate airtightness of the building envelope. Appendix A shows the Ishikawa diagram of the lack of airtightness of the building envelope. The Ishikawa diagram (Appendix A) illustrates the potential determinative factors, influences and effects that may affect the final airtightness of the building envelope. The potential factors are determined based on experiences of previous research in the Czech Republic and abroad. The factors are divided into 6 basic modified categories based on the categorization 6M – Object (building), Materials, Measurement, Technology, Mother nature and Man.

According to the current research, year of construction, number of floors, building size, complexity and comprehensiveness of the building envelope, the existence of the basement or the chimney are factors that may have a potential impact on the final airtightness of the building. The current foreign researches [5, 6] show differences depending on the material solution. Construction type, basic building materials or materials of airtight layer may have a potential impact on the final airtightness of the building envelope.

It is desirable that the number of penetrations and niches for electric distribution and HVAC was minimal. It is recommended to install modern technological systems for heating and ventilation. The systems with heat recuperation reach efficiency about 90%. The mechanical ventilation ensures fresh air with minimal heat losses.

Quality in every step of the process is an integral prerequisite for sufficiently airtight of the building envelope. Skill and experience are necessary at each stage from the designer, implementer to inspector performing the control measurements. Incorrect or insufficient communication and coordination significantly increases the probability of the lack of airtightness of the building envelope.

The environment does not have a direct impact on airtightness of the building. However, the exposure of the building, altitude and wind zone have a significant influence on the pressure effects which affect the amount of air flowing through leaks in the building envelope.

An inaccurate result of measurement may have a negative impact on the calculations of the energy performance of building.

3. The Evaluation of the Ishikawa Diagram

Identifying potential causes of the problem is the first step in a comprehensive analysis of the causes. The assembled Cause and Effect Diagram gives a clear and categorized list of causes of the problem (Appendix A). Tabulated summary of all potential causes, effects and impacts allows carefully analyze the problem and then propose the necessary the measures.

Brainstorming is useful method for evaluation and determination the significance causes of the problem. The evaluation is performed on the discussion with five experts in field of measuring the air permeability of the building envelope. Each of potential causes of Ishikawa diagram is evaluated by points from 1 to 5. The number 1 indicates minimal effect and 5 illustrates maximum effect. The total weight of the significance of sub-cause is the sum of the multiple of the significance of sub-cause and the significance of the general cause of all surveyed experts. The evaluation of the significant factors is performed by Pareto analysis.

3.1 Pareto Analysis

Pareto analysis or Pareto chart is a specific type of histogram that identifies and determines the priority causes and the irrelevant causes. The aim of the Pareto analysis is to define a small number of factors, which significantly affect the result of the problem. In our case, it is an inadequate airtightness of the building envelope. The Pareto principle states that, about 80% of the effects come from 20% of the causes. [7, 8]

In the first part of the Pareto analysis, it is necessary to arrange simple absolute frequencies of potential causes from the largest to the smallest. The arranged absolute simple frequencies are plotted in the graph from the largest to the smallest significance. The Lorenz curve is defined as the sum of the relative frequencies of potential causes. The value of 80% on the Lorenz curve divides the significant and irrelevant causes of the problem. Alternatively, it is possible to choose a different percentages (eg. the rule 50/50). It is necessary pay attention to significant factors of problem.

Appendix B shows the results of Pareto analysis with Lorenz curve. According to the rule 80/20, the significant factors of airtightness of building envelope are Poor quality of execution (realizations), Material of airtight layer, Wrong coordination of works, Poor quality of design (designer), The lack of control, Building materials, Filling construction, Durability of materials, Construction type, Complexity of object, Existence of chimney, Object size, Year of construction and Existence of basement (labeled from P to E). Due to the extensive number of causes, it is appropriate to apply the stricter rule - the rule 50/50. In this case, the main causes are Poor quality of execution (realizations), Material of airtight layer, Wrong coordination of works, Poor quality of design (designer), The lack of control, Building materials and Filling construction.

The results of Pareto analysis identifies as the most important cause of the lack of airtightness of building envelope poor quality of execution, ie. wrong realization of the object. Optimization of the most important factors can provide a significant reduction of the airtightness of the object and thereby increase the energy efficiency of current construction.

6. Conclusions

The result of Ishikawa diagram and Pareto analysis clearly indicates the main cause of the lack of airtightness of the building envelope the category of Man (people). People occupy more than 50% of the significant causes. The main cause is poor quality of execution (realization). Next important group affecting the problem of lack airtightness is the category of Materials. The questionnaire survey clearly shows that the problem of airtightness lies in poor quality of building materials and in the realization of the object. However, quality of implementation of airtight layer and the whole object is practically very difficult verifiable.

Finally, it is important to highlight the fact that Pareto analysis is made on basis of questionnaire survey. The questionnaire survey is to be considered as subjective. The results of Pareto analysis can only be considered as hypothesis, which to be further verified by the relevant statistical tests.

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References

[1] Kraus M. and Kubečková D., *Airtightness of energy efficient buildings*, 1st Annual International Conference on Architecture and Civil Engineering, Singapore: Global Science and Technology Forum, 2013, pp. 29 – 35.

[2] Jaccard M., *The objective is quality: an introduction to quality*, 1st edition, Switzerland, EPFK Press formance and sustainability management systems, 2013, pp. 400.

[3] Korecký M. and Trkovský V., Management rizik projektů: se zaměřením na projekty v průmyslových podnicích, Praha, Grada, 2011, pp. 584.

[4] http://www.ikvalita.cz/tools.php?ID=26

[5] Johnson D., *Low Carbon Housing Learning Zone: Airtighntess*, Leed Metropolitan University.

[6] Olivier D., *Air Leakage Standards: Unpublished DTLR Report.* London, 1999.

[7] Kotler P. and Keller K. L., *Marketing management*, 12. vyd., Praha, Grada, 2007, pp. 788.

[8] Veber J., *Kapesní počítačový slovník anglicko-český*. 1. vyd., Brno, Computer Press, 2003, pp. 60.



Appendix B: Pareto Analysis and Lorenz Curve



Determination factors (causes)

Symbol	Cause	Cumulative frequency	Symbol	Cause	Cumulative frequency
Р	Poor quality of execution (realizations)	10.20 %	Е	Existence of basement	81.63 %
Ι	Material of airtight layer	17.71 %	L	Technology of ventilation	84.57 %
R	Wrong coordination of works	25.06 %	Ν	HVAC and electro distribution	87.18%
0	Poor quality of design (designer)	32.00 %	С	Number of floors	89.63 %
Q	The lack of control	38.94 %	S	Irrelevant input data (object size, ,)	91.51%
Н	Building materials	45.80 %	М	Technology of heating	93.31 %
K	Filling construction	52.33 %	U	The lack of qualification of inspector	94.53%
J	Durability of materials	58.53 %	V	Failure of the measurement procedure	95.76 %
G	Construction type	64.41 %	W	Poor preparation of measurement	96.98 %
В	Complexity of object	68.41 %	Х	Exposition of object	97.96 %
F	Existence of chimney	72.08 %	Т	Uncalibrated fan	98.78 %
А	Object size	75.51 %	Z	Wind zone (area)	99.43 %
D	Year of construction	78.69 %	Y	Altitude	100.00 %

THERMAL REGIME OF THE LINE PART AT THE TRANSIT GAS PIPELINE

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Abstract: For calculating the temperature field complex it is necessary to create several models. The first model includes the calculation of the pressure loss during transport, which significantly influences the gas temperature decrease. The pressure loss was most affected by the pipe diameter and gas flow. The official gas flows of Eustream company were used as inputs for this model. The third model provides temperature courses in the soil without affection of gas-pipeline. These models were necessary to develop because they serve as input data for the final fourth model, which calculates the temperature field of every single line transit pipeline (gas flows in the pipeline). Method of elementary balances. On the basis of the analysis, it is possible to determine whether it will be influence and to what extent may be influence of individual gas-pipelines.

Keywords: temperature and pressure field, natural gas, gas pipeline

1. Introduction

Defining the temperature field gives information about course of temperature in the soil to the ground surface. By this information it is possible to set heat loss to the surrounding area. It is very difficult to determine thermal field because of interference of many factors, which physical properties vary with time. Long-term measurement of daily temperature and amplitude determination of the surface temperature are necessary to determination of temperature course in the soil. [1]

2. Methodology solution of temperature fields

For the analysis of interaction with individual lines of gaspipelines, following points should be determined:

- calculation of soil temperature in the pipe axis for different soil conditions (without affecting gaspipeline)
- calculation of the pressure and temperature drop during gas transportation in gas-pipeline
- calculation of temperature fields for individual line of the transit gas-pipeline
- analysis of temperature fields by using computer simulation
- graphic evaluation of individual temperature fields

2.1 Temperature course in the soil

Soil temperature significantly affects the heat transfer from gas to the environment. Differences in soil temperatures depend on air temperature changes and are characterized by daily and annual course. The rate of change is mainly dependent on physical properties of soil e.g. ability of the soil to absorb solar energy, thermal conductivity and heat capacity. [2]

Based on long-term measurements of air temperature (by determining the average daily temperature, amplitude of the surface temperature, amount of rainfall) and physical properties of soil it is possible to determine temperature course in soil by calculation:

$$t_{h} = t_{0} + A_{0} \cdot e^{-\frac{h}{B}} \cdot \sin\left(\omega \cdot \tau - \frac{h}{B}\right) \ [^{\circ}C], B = \sqrt{\frac{2 \cdot a}{\omega}}$$
$$= \sqrt{\frac{\tau \cdot a}{\pi}}$$

where, t_h is soil temperature in depth [°C], t_0 is middle surface temperature in the monitored period [°C], A_0 is amplitude of the surface temperature [K], h is depth [m], Bis depth at which the amplitude of the soil temperature is equal to 1/e of the surface temperature amplitude [m], ω is constant, τ is period (12 months), a is heat conductivity [m².s⁻¹]

Based on the physical properties of soil (Tab.1) calculations for determination of the temperature course at different air temperatures were made. Temperature course was being calculated to the depth of deposit for the whole gas-pipeline route (KS01 – RU, 410 km).

Table 1 Physical properties of soil

Physical properties	Soil state			
	dry	humid	frozen	
Thermal conductivity λ [W.m ⁻¹ .K ⁻¹]	0,63	1,93	1,63	
Specific heat capacity <i>cp</i> [J.kg ⁻¹ .K ⁻¹]	1756	2104	1485	
Density ρ [kg.m ⁻³]	1600	1700	1500	
Heat conductivity a [m ² .s ⁻¹]	2,24231.10-7	5,39588.10 ⁻⁷	6,86027.10-7	

Figure 1: Temperature course in dry soil at positive air temperature



Figure 2: Temperature course in humid soil (precipitation totals 203 mm)



Figure 3: Temperature course in frozen soil at low air temperature

2.2 Temperature and pressure field of natural gas

During transportation of natural gas, pressure significantly affects decrease in temperature. For calculation of pressure losses in each elementary sections formula for horizontal gas-pipeline was used. [3]

$$p_p^2 - p_k^2 = \frac{\lambda \cdot m^2 \cdot Z \cdot r \cdot T_s \cdot x}{F^2 \cdot d} \quad [MPa]$$

where, p_p is initial pressure [MPa], p_k is final pressure [MPa], λ is resistance coefficient, *m* is mass flow of the gas in the pipeline [kg.s⁻¹], *Z* is compressibility factor, *r* is specific gas constant [J.K⁻¹.kg⁻¹], *T_s* is middle gas temperature [K], *x* is elemental section of pipeline [m], *F* is pipeline surface [m²], *d* is internal diameter [m]

When determining the pressure loss for the entire transit system it is necessary to take into account the profile of gas-pipeline route. In section between KS01 and KS02 difference in height reaches 200 m. For this reason, it is necessary to calculate this section with formula of pressure drop in taking into account the relief routes (pipeline with cant). [3]

$$p_p^2 - p_k^2 \cdot e^b = \lambda \cdot m^2 \cdot \frac{Z \cdot r \cdot T_s \cdot x}{F^2 \cdot d} \cdot \frac{e^b - 1}{b} \quad [MPa], a$$
$$= \frac{2 \cdot g}{Z \cdot r \cdot T_s}, b = a \cdot \Delta z$$

where, g is gravity acceleration [m.s⁻¹], Δz is pipeline superelevation [m]

The basic prerequisite for the calculation of pressure drop in the pipeline is to determine the appropriate value of the coefficient of resistance, which in itselt implies the complex nature of flow effects resulting from the properties of the pipe (diameter, surface roughness of the pipe). Equation for the area of roughness pipes, $\text{Re} > \text{Re}_{k2}$

$$\lambda = 0,111. \left(\frac{\delta}{d}\right)^{0,25}$$

Temperature of the flowing gas in the pipeline depends on physical conditions of the gas movement and heat exchange with surrounding. For the calculation of the gas temperature decrease after each elementary section is valid following formula:

$$T = T_{ok} + (T_p - T_{ok}) \cdot e^{-A \cdot l} - D_{J-T} \cdot \frac{p_p - p_k}{l} \cdot \frac{1 - e^{-A \cdot l}}{A}$$
[K]

where, T_{ok} is temperature of the surrounding area [K], T_p is natural gas temperature [K], A is base flat [m], l is total length of the pipeline [m], D_{J-T} is Joule-Thomson coefficient [K.MPa]

Equation characterizes the temperature distribution along the length of the gas-pipeline. The last term in equation characterizes the Joule-Thomson effect. The influence of Joule-Thomson effect causes a temperature drop in the interval $4 - 6^{\circ}$ C. The graphic dependencies temperature decrease and pressure decrease on the distance between the two compressor stations are shown in Fig. 4-7. [4]

To determine the pressure and temperature differential it was necessary to set boundary conditions shown in Tab. 2 (calculations were performed with use of official flows from Eustream company).

Table 2 Input data for the calculation of the natural gastemperature and pressure regime

Compressor station	Output temperature [°C]	Output pressure [MPa]	Flow [mld.m³/day]	
KS01	35	7	281	
KS02	30	7	280,5	
KS03	30	7	280	
KS04	35	7	279,5	
Air temp	perature	Temperature in the pipeline axis		
[°C]		[°C]		
	- 1			
Sim 1	Sim 2	Sim 1	Sim 2	
Sim 1 6,3	Sim 2 -8,79	Sim 1 5,18	Sim 2 2,34	
Sim 1 6,3 6,3	Sim 2 -8,79 -3,93	<i>Sim 1</i> 5,18 5,37	Sim 2 2,34 3,67	
Sim 1 6,3 6,3 5,6	Sim 2 -8,79 -3,93 -0,58	<i>Sim 1</i> 5,18 5,37 5,21	Sim 2 2,34 3,67 2,54	
<i>Sim 1</i> 6,3 6,3 5,6 5,04	Sim 2 -8,79 -3,93 -0,58 -3,625	<i>Sim 1</i> 5,18 5,37 5,21 4,3	Sim 2 2,34 3,67 2,54 4,52	



Figure 4: The pressure decrease between two compressor stations for different pipe diameters (sim 1)



Figure 5: The pressure decrease between two compressor stations for different pipe diameters (sim 2)



Figure 6: The temperature decrease between two compressor stations for different pipe diameters (sim 1)



Figure 7: The temperature decrease between two compressor stations for different pipe diameters (sim 2)

2.3 Calculation of temperature field in cylindrical wall The method of elementary balances was used to resolve unsteady heat transfer in three dimensional temperature field. For each element is formulated balance equation and from the way of solving it is possible to create an algorithm for whole temperature field. For values Δr , $\Delta \varphi$, Δz uses the following simplifications:

- heat flux passing through within the interval (*i*.Δτ, (*i*+1)Δτ) by specific area is proportional to the temperature gradient at time (*i*.Δτ)
- enthalpy change of element is a function of temperature change in the middle of an element

Transient heat transfer by conduction in the element is in interval $\langle i. \Delta \tau, (i+1) \Delta \tau \rangle$ characterized by:

- enthalpy change due to the heat transfer by conduction between neighboring elements through each layers of element
- by the enthalpy change of element there is a change of temperature in element [5]

Transit pipeline has a cylindrical shape so it is necessary to perform a calculation in cylindrical coordinates. The beginning of the coordinate system is placed in a thermally isolated suface of the cylinder, the axis of the cylindrical coordinates will by placed on the axis of the cylinder. System of equation of heat transfer in a cylindrical wall has the form:

$$\tau > 0; r_1 < r < r_2; 0 < \varphi < 2\pi; 0 < z < L$$

$$\frac{\partial T(r, \varphi, z, \tau)}{\partial \tau} = a \left[\frac{\partial^2 T(r, \varphi, z, \tau)}{dr^2} + \frac{1}{r} \cdot \frac{\partial T(r, \varphi, z, \tau)}{dr} + \frac{1}{r^2} \cdot \frac{\partial^2 T(r, \varphi, z, \tau)}{d\varphi^2} + \frac{\partial^2 T(r, \varphi, z, \tau)}{dz^2} \right]$$

The principle is to create elements, in which temperatures are monitored. Each element has determined spatial coordinate system at a distance Δz diversions according to the angle $\Delta \phi$ and spacing depending on the radius Δr . Points corresponding to the individual surfaces of the element are indicated as 0, a, b, c, d, e, f (Fig. 8), while the value of the temperature at the point 0 is determined by the listed points. [6]



Figure 8: Calculate of element of computing mesh

For the temperature in the next time step is:

$$T_{i,n,m,k+1} = \left[1 - 2\left(\Delta Fo_r + \Delta Fo_{\varphi} + \Delta Fo_z\right)\right]T_{i,n,m,k} + \Delta Fo_r \left(1 - \frac{\Delta r}{2r_i}\right)T_{i-1,n,m,k} + \Delta Fo_r$$

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$$\begin{pmatrix} 1 + \frac{\Delta r}{2r_i} \end{pmatrix} T_{i+1,n,m,k} + \Delta F o_{\varphi} (T_{i,n-1,m,k} + T_{i,n+1,m,k}) + \Delta F o_z (T_{i,n,m-1,k} + T_{i,n,m+1,k}) \Delta F o_r = \frac{a.\Delta \tau}{\Delta r^2}; \ \Delta F o_{\varphi} = \frac{a.\Delta \tau}{r_i^2.\Delta \varphi^2}; \ \Delta F o_z = \frac{a.\Delta \tau}{\Delta z^2}$$

The equation shows that, when the temperature at the point 0 is known, as well as in neighbouring points that surround this point in time τ_k temperature field in the layer of the cylinder at the moment of time τ_{k+1} is counted. [6]

3. Result analysis

The deposit depth of the individual lines of transit gaspipeline are shown in fig. 9, distance between each pipeline is circa 30 m. By mathematical model created with the help of software called Matlab Simulink it was found that although there is adequate distance between gas-pipelines from each other, there is an influence of temperature fields of each pipeline (Fig. 9, moist soil (blue), dry soil (red), frozen soil (orange)).



Figure 9: Temperature course between 1. and 2. line of transit gas pipeline



Figure 10: The transverse temperature gradient at extreme line of gas pipeline

Figure 10 shows a graphical representation of a transverse temperature gradient, which indicates that the temperature is beginning to stabilize at a distance of approx. 8 m from the line of gas pipeline and at a distance of 10.5 meter is field of temperature gas pipeline approaches the temperature of the surrounding soil. In Table 3 are shown the calculated values of physical quantities through the pipe wall.

Distance	Pressure	Temp.	k	t_1	t_2
[km]	[MPa]	[°C]	[W.m ⁻	[°C]	[°C]
			$^{1}.K^{1}]$		
0	7	30	10,98	29,9	30
10	6,87	28,72	10,8	28,63	28,72
20	6,75	27,42	10,61	27,34	27,42
30	6,63	26,16	10,43	26,09	26,16
40	6,5	24,91	10,25	24,85	24,91
50	6,37	23,69	10,07	23,63	23,69
60	6,24	22,48	9,9	22,44	22,48
70	6,1	21,28	9,74	21,24	21,28
80	5,96	20,1	9,57	20,07	20,1
90	5,82	18,93	9,41	18,92	18,93
100	5,68	17,78	9,26	17,77	17,78

 Table 3 The values of thermal-physical variables in the transfer of heat through the pipe wall

k – heat transfer coefficient, t_1 – the temperature on the inside of the pipe, t_2 – the temperature of the outside of the pipe

4. Conclusion

The main aim of this paper was to calculate temperature course in soil during transportation of the natural gas in transit gas-pipeline. In the first place we calculated temperature course in soil to deposit depth of transit gaspipeline for the whole route of gas-pipeline. For the performed calculations we used program MS Excel whereby output is in the form of a graphical dependencies (Fig. 1 - 3). In the next step temperature and pressure profile of natural gas was being calculated in program Matlab. These calculations were used as input data for calculation of temperature field. When comparing the temperature courses in soil, it is obvious that transit gaspipeline greatly affects soil temperature field, character of temperature course is completely changing. In the next step affection simulations of lines of gas-pipeline were performed. Temperature course was calculated with the method of elementary balances. On the basis of calculations and outputs of a mathematical model following was found:

- decrease in flow does not have cardinal importance in the temperature and pressure decrease of natural gas
- on the gas temperature drop has higher impact Joule-Thomson effect more than temperature of surrounding area
- temperature drop through the pipe wall reached 0,25°C at different pipe diameter and various gas temperature.
- gas temperature greatly influences the temperature course in soil towards ground surface and also at transverse temperature gradient.
- at the distance 30 m from individual lines of gaspipelines there is an influence of soil temperature, it does not matter whether the pipes has various diameters.
- the highest temperature drop was being observed at frozen soil, where soil was frozen to a depth of 0,5 m. Temperature in the gas-pipeline was in the range 20 – 30°C and temperature in depth of 0,2 m reached minus temperatures.

References

[1] Gesrsten, K., Papenfuss, D., Kurschat, Th., Genillon, Ph., Fernandez, F., Revell, N., *Heat Transfer in Gas*
Pipelines, In: OIL GAS European Magazine, Vol. 31, No. 1, pp. 30-34, 2005

[2] Fasold, H., Wahle, H.: *Einfluss der Luft- und Bodentemperatur auf die transportkapazität von Erdgasversorgugnssystemen*, In: Gas Erdgas, Vol. 21, No. 7, pp. 303-312, 1995

[3] Jufin, A., *Truboprovodnij transport neftu I gaza*, Moscow, Nedra, 1978

[4] Dvořák, V., Tichý, T., *Prubeh teploty plynu v dálkovém plynovodu*, In: Plyn, pp. 36-39, 1978

[5] Durdán, M., Mojžišová, A., Laciak, M., Kačur, J., *System of indirect temperature measurement in annealing process*, In: Measurement, Vol. 47, No. 1, pp. 911-918, 2014

[6] Széplaky, D., Varga, A., Rajzinger, J., *Influence of gas temperature on temperature field in the area of transit gas-pipeline*, Procedings of 19th International Conference: The application of experimental and numerical methods in fluid mechanics and energetica 2014, pp. 234-239, Liptovský Ján, Slovakia, 9-11 April 2014

INITIAL CONDITIONS DETERMINATION FOR TRANSIENT THERMAL FIELD ANALYSIS

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Abstract: Real transient boundary and initial conditions are determined for individual locality simulation purposes. The most helpful are on-site measurement facilities with nearby weather data monitoring. Measured ambient exterior and interior air temperatures are used as boundary conditions for temperature initial condition determination. Temperature in structure changes quickly but in specific cases it has to be taken into an account even when thermal field simulations are done. Its need of consideration is demonstrated on experimental chamber test wall. Measured and calculated values are compared.

Keywords: boundary conditions, initial conditions, temperature, thermal diffusivity, transient numerical analyses

1. Introduction

The contribution presents initial and boundary temperature conditions measurement and numerical application results. This measurement was part of terminated research on experimental outdoor chambers where the various opaque transparent envelope parts were monitored and simultaneously with exterior and interior environment conditions. The goal was to demonstrate an impact of transient natural boundary conditions on in-structure and surface temperature, heat flow and hygrothermal load. Structures state monitoring in non-stationary boundary conditions is a current trend of building physics researches in Dubendorf, Glasgow, Cottbus, Chambery, Innsbruck, Almeria, Espoo, Leuven, Bratislava etc., since 1993 [1, 2]. Initial and boundary conditions measured data application in validation of simulations is the investigation aim [3].

Weather data used for numerical calculation purposes could be dived on: Typical weather data, Weather data for design purposes and Weather data for individual investigations. In order to create a typical weather data set, a popular procedure is to select a year deemed typical from a longer data series, following appropriate criteria. The resulting weather year then has never existed in this form, but it is expected to represent typical conditions as well as possible. Data for design purposes are usually used to test the ability of a component to withstand more strainful conditions than typically encountered. Weather data that have been measured for an individual location and time period must be used if, for example the cause for a given damage case shall be investigated ('forensic' simulations). Measurements performed on or in a building are being accompanied by simulations for analysis or deeper insight and if measurements and calculations shall be compared in order to validate a simulation model. In such a case it may be sufficient to use data which a nearby weather station has collected for relevant time period. Often, however, you will have to perform your own on-site measurements. Data taken at the location are also needed if the radiation or rain load on the surface has to be determined more accurately than is possible with directional conversion models [4].

For the thermal field calculation initial condition typically expresses the initial temperature in the body profile at the start of heat transfer process (t=0). There are several options to consider the initial temperature value in the structure, respectively its distribution in the profile [4]. These options are in the next part of the article specified and their use is demonstrated by examples of simple structures, respectively experimental chamber test wall.

2. Methodology

2.1 Measurement

General long-term on-site measurement methodology is specified. Measured parameters were exterior and interior ambient air temperature and relative humidity; temperature and relative humidity inside the structure, surface temperature and heat flux. Weather station measure wind direction, average and maximum wind speed, barometric air pressure, air temperature and relative humidity, rainfall and we also monitor global radiation by Pyranometer. Interior environment conditions – ambient air temperature and relative humidity were measured by a digital sensor with decimal resolution, Fig.1.



Figure 1: Environment data measuring devices. On the left – weather station, middle – Pyranometer, right – indoor air temperature and relative humidity measuring sensor

Data collection from sensors is carried by fully automatic data logger connected by a data cable with USB connector and Bluetooth technology (the collector) on a computer with an Internet connection. Data are gained and recorded in one-minute steps and stored to computer hard drive.

2.2 Application

Present research is now already terminated and we have obtained the weather data database for individual investigations. The database consists of mentioned measured parameters from February 2012 till March 2014 and it provides authentication options from different perspectives: mathematical and statistical validation, nonstationary boundary conditions, material properties and initial conditions for transient simulation purposes. Any simulation types could be used - energetic, overheating, thermal fields, hygrothermal load or coupled heat and moisture analysis (Design Builder, Physibel, WUFI, Delphin, etc.) [3]. All the collected outdoor climate data we use for specific experiments purposes (on site and numerical) bound to the testing samples analyzed in the experimental chambers, respectively experiments in the surrounding locality Košice - Northern city. Numerical thermal field analysis validated by the experimental measurement in experimental outdoor chambers is used for recognize the real heat-air-moisture behaviour in the various constructions and were already published in [5, 6].

3. Boundary conditions





Exterior boundary conditions mostly used in simulations are shown in Fig. 2, 3. For the calculation that demonstrates influence of initial temperature conditions from the package of measured weather data parameters for 2013 are chosen - exterior and interior air temperature in monitored time period from 1st till Nov. 6th 2013, (in fact the data from Oct. 31st 2013 - for start-up pre-calculation purposes), plotted in Fig.4. In the Fig.4 there are also plotted the simple sinusoidal function for exterior and constant value for interior air temperature used in 4.1.



Figure 3: Measured global solar radiation (W/m²) data for Kosice-city locality. Displayed chosen period from 05/2013 till 12/2013



Figure 4: Boundary conditions for initial temperature conditions determination made in Chapter 4. Measured and random courses of ambient air temperature

4. Initial conditions

Before starting the simulation process as accurate as possible knowledge of the initial condition is needed. To solve the transient thermal field this means information about temperature distribution across the structure before time t=0 h. Initial temperature condition is contemplated as

- constant across the component profile,
- calculated from the known course of the temperature before starting the simulation (use of pre-calculation),
- from known temperature profile.

The easiest initial conditions assignment for simulation is to use a constant temperature across analyzed component. The most accurate initial conditions assignment at time t=0is the application of a known temperature profile. Exact information about temperature profile is rarely known so it is appropriate to determine initial condition numerically. Thus determined temperature is calculated using known steady ambient temperatures before time t=0 or known transient course of temperature (start-up pre-calculation).

4.1 Determination of temperature initial conditions

The balancing of temperature in two materials (AAC and Sandstone) is shown in Fig. 8 and 9. For clarity as a boundary condition for the calculation is used simple function (sinusoid), Fig.4. As the initial temperature before starting the calculation (before t=0 h) is considered:

- in 1st case constant temperature value 20 °C across the wall profile;
- in 2nd case in time t=0 temperature is calculated stationary from ambient temperatures, no start-up precalculation;
- in 3rd case start-up pre-calculation used (calculation before t=0 h duration of 1 day).

Characteristics and basic material parameters of Autoclaved Aerated Concrete (AAC) experimental chamber test wall and examples of simple walls which are used are given in Tab. 1, where ρ is the bulk density, *c* the specific heat capacity, λ the thermal conductivity.

 Table 1 – Composition of the structure (layers are stated from interior). Basic material parameters

No.	Name of Structure Specimen	Name of layer	λ W/(m.K)	c J/(kg.K)	ρ kg/m ³
S 1	Experimental	AAC P2-350	0.105	900	350
	(AAC + EPS)	EPS	0.034	920	16
S2	Simple AAC Wall	AAC P2-350	0.105	900	350
S 3	Sandstone Wall	Sandstone	1.700	840	2600



Figure 5: Structures specimens according to Table 1 (interior is upwards). Location of positions for plotted calculated and measured temperature data from Fig.7-11

Heat transfer in time is described by the Fourier second partial differential equation for heat transmission (1). For balancing of temperature in the structure thermal diffusivity is critical (2).

$$div(\lambda gradT) + Z_q = c.\rho.\frac{\partial T}{\partial t}$$
(1)

$$a = \frac{\lambda}{c.\rho} \tag{2}$$

where: $a \text{ (m}^2\text{/s)}$ thermal diffusivity, $\lambda \text{ (W/m.K)}$ thermal conductivity, $\rho \text{ (kg/m}^3\text{)}$ bulk density, c (J/(kg.K)) specific heat, $q \text{ (W/m}^2\text{)}$ heat flux, Z_Q heat source (W/m³), T thermodynamic temperature (K).

Transient calculation is made in Physibel software, module BISTRA. The energy balance method is used to set up a system of linear equations. The system is solved using the Crank-Nicolson finite difference method. This method meets the criteria of the standard STN EN ISO 10211 Annex A, for software computing methods [7].



Figure 6: Plotted temperature courses of structure specimen S1in Position 1 according to Tab.1and Fig.5



Figure 7: Plotted temperature courses of structure specimen S1in Position 2 according to Tab.1and Fig.5



Figure 8: Plotted temperature courses of structure specimen S2 in Position 1 according to Tab.1and Fig.5

Fig. 8 and 9 show balancing of temperature effect caused by different a - value (2). Test case with simple boundary conditions demonstrates a possible error by using different types of initial condition. The thermal transmittance change (ETICS application) causes longer balancing of temperature. When AAC with ETICS is used balancing lasts for more than 5 days (Fig. 6 and 7). When temperature courses analysis in building construction for short time intervals entering the correct initial conditions has the importance.



Figure 9: Plotted temperature courses of structure specimen S3 in Position 1 according to Tab.1and Fig.5

4.2 Results of using the initial conditions

Climate conditions, often represented as Test Reference Year have a dynamic character. In Fig. 10 and 11 there are temperature courses at selected positions of experimental chamber test wall according to the scheme in Fig.5. Measured weather data are used as boundary conditions Fig. 2, 3, 4.

Examined is the effect of initial condition, respectively start-up pre-calculation length on balancing of temperature speed in the real structure. Calculated data are confronted with measured temperature values in the positions of the test wall. Compared are measured values and numerical analysis results from no start-up pre-calculation and 1 day start-up pre-calculation.



Figure 10: Plotted temperature courses in experimental chamber test wall. Various initial condition considerations



Figure 11: Plotted temperature courses in experimental chamber test wall. Various initial condition considerations

5. Conclusion

The accuracy of numerical calculations is determined by the correct input data. Initial conditions of calculation are often associated with a quantity that persists in structure for a longer period of time for example water content. Entering the initial conditions for temperature is often neglected in the simulation process. The article analyzes the possibilities of entering the initial temperature in transient thermal field simulation. The transient numerical analysis results show that incorrect initial temperature consideration is reflected in balancing of temperature for several days. During these several days there are distorted calculated values. On the other hand, enter the correct initial temperature using start-up pre-calculation showed good compliance with measured temperature values. The differences could be caused by number of factors and their detection will be an object of our future work.

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References

[1] P. A. Strachan, L. Vandaele, Case studies of outdoor testing and analysis of building components, *Building and Environment*, Vol. 43, pp. 129–142, 2008

[2] P. H. Baker, H.A.L. van Dijk, PASLINK and dynamic outdoor testing of building components, *Building and Environment*, Vol. 43, pp. 143–151, 2008

[3] T.Z. Desta et al., Experimental data set for validation of HAM transport models of building envelopes, *Building and Environment*, Vol. 46, pp. 1038-1046, 2011

[4] http://www.wufi.de/index_e.html

[5] D. Katunský et al., Experimentally Measured Boundary and Initial Conditions for Simulations, *Advanced Materials Research*, Vol. 1041, pp. 1-4, 2014

[6] D. Katunský et al., Numerical analysis and measurement results of a window sill, *Advanced Materials Research*, Vol. 899, pp. 147-150, 2014

[7] Physibel Software, *User manual for Physibel*, Maldegem, Belgium 2013, pp. 25-26

ANALYSIS OF THE THERMO-TECHNICAL PARAMETERS OF A BUILDING WITH GREEN ROOF

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Abstract: Claim of this article is showing possible ways of designing green roofs in accordance with STN standard. In this paper, three different roofs are described in two possible ways, current state and designed state. Building these kind of roofs should mean bringing nature to the cities in any possible ways. This article is about green roofs, their position, constructive solution and thermo-technical parameters. This paper focuses on thermal transmittance and lowest surface temperature in steady state boundary conditions. First thing, the article is pointing at relative humidity of each three green roofs in both states, , current state and designed state, minimum humidity and maximum humidity. It is also pointing at air temperature and humidity in interior conditions and exterior conditions. Second thing, the article is pointing at is field of temperature of each three green roofs in both states, current state and designed state. Point of minimum interior surface temperature, point of minimum exterior surface temperature, required lowest surface temperature and U values till year 2015 and after year 2015 in steady state boundary conditions are main claim of this article it is focusing on.

Keywords: single-wall green roof, double-wall green roof, triple-wall green roof, relative humidity, field of temperature

1. Introduction

Many masterplans with lots of green areas and free spaces were representing symbolic meaning of people owning land. Being close to nature, able to touch the tree, walk barefoot on the grass has so deep meaning and idea for every human that it sets to zero all the negatives[1,2].

The act of greening a building, act of greening a bus stop, kiosk, placing garden on existing building makes deep statement about the way we see, or the way we should see the world. Buildings with green tops should become fascinating objects. Grass and vegetation has on earth its natural horizontal space. So why should it be a problem putting soil on top of the building and have things growing. There is something strange about it, more than ecological. This reconciles humans with nature [3].

Roof construction with substrate and vegetation layer raises quality parameters of artificial environment, raises quality parameters of the building and its internal comfort. It also raises qualitative index of the green roof construction in compare with roof construction without substrate and vegetation layer. Vegetation layer on roof construction has an ecological aspect for the entire building that cannot be overlooked. Green roofs are also both architecturally and visually appealing forms of roof construction. It allows creating new volumes, new architectural surfaces that depend on design of the construction and aesthetical possibilities of the green roof. Construction design of the details and all roof structures intervene applied building physics[4].

2. Methodology

Question of maintaining full valued urban vegetation during contemporary urban development is nowadays an issue of modern society heading towards building ecologically, building smart, using nature, using sustainable development that is supported by European legislative and supporting programs [5,6]. While designing the construction of the roof, it is necessary to suit the construction of the roof to the static analyses, consider building's and the roof's physical attributes for future use [7,8,9].

Solving details and green roof structures directly affects reliability of the roof in term of thermal physics requirements following STN [10] standard. Construction design of the details and all roof structures intervene applied building physics. With its theoretical and experimental rules it must eliminate ineligible water penetration, but it must respect the request of designed vegetation [11,12].

This paper is pointing at three different constructive solutions of green roofs. Single-wall, double-wall and triple-wall in accordance with STN [10] standard. Each solution has two different designs- current state and designed state. Current state represents design of the roof in accordance with STN [10] standard till year 2015. Designed state represents design of the roof in accordance with STN [10] standard after year 2015.The difference between these two designs is in its layers, their thicknesses. Svoboda Software, module AREA was used to do the comparisons, all the figures are outcomes of this software.

The aim of this paper involves an analysis of the thermotechnical parameters of a building with a green roof in accordance with STN [10] standard. This paper focuses on thermal transmittance and lowest surface temperature in steady state boundary conditions. In accordance with STN [10] standard till year 2015, U=0,2 [W/m².K] (in this paper, U=0,2 is considered for current state). In accordance with STN [10] standard after year 2015 U=0,1 [W/m².K] (in this paper, U=0,1 is considered for designed state). Aim of this paper is to show different roofs that U values are in accordance with the standard. Required lowest surface temperature θ si =12,83°C in accordance with STN [10] standard for interior conditions: air temperature 20°C and humidity 50%. Aim of this paper is to show different roofs that θ si values are in accordance with the standard.



Figure 1: Single-wall green roof. Left: current state. Right: designed state (Own processing)

Single-wall green roof-current state section is in Fig. 1 on the left, layers are described in Tab.2. Single-wall green roof-designed state section is in Fig. 1 on the right, layers are described in Tab.1. Following the static analyses, spacing between rafters is 800 mm.

Table 1 Single-wall green roof (Own processing)

	LAYER	C.STATE	D. STATE
1	vegetation	-	-
2	reinforced strengthened substrate	20 mm	150 mm
3	filtering – protecting layer	1 mm	1 mm
4	water holding – drainage layer	7 mm	25 mm
5	root barrier membrane	1,7 mm	1,7 mm
6	thermal insulation	200 mm	360 mm
7	vapour barrier	0,7 mm	0,7 mm
8	roof deck - load bearing structure	24 mm	60 mm
9	closed aeration layer	35 mm	50 mm
10	flashing batten across the gutter	-	-
11	lower ceiling	12 mm	12 mm
12	load bearing roof structure	-	-
13	antierosion protection profile	-	-



Figure 2: Single-wall green roof-current state. Left: Relative humidity [%]. Right: Field of temperature [°C](Own processing)

Relative humidity [%] of single-wall green roof-current state is in Fig. 2 on the left. Range of humidity is 19%-100%. Minimum humidity is between 19% and 27%, maximum between 92% and 100%. Interior conditions: air temperature 20°C and humidity 50%. Exterior conditions: air temperature -15°C and humidity 84%.

Field of temperature [°C] of single-wall green roof-current state is in Fig. 2 on the right. Range of temperature is between -14,80°C and 19,90°C. Isothermal line of the required lowest surface temperature (12,83°C) is in Fig. 2 on the right. Point of minimum exterior surface temperature (-14,00°C) and point of minimum interior surface temperature (18,35°C) is in Fig. 2 on the right.

In accordance with STN [10] standard till year 2015, U=0,2 [W/m².K].



Figure 3: Single-wall green roof-designed state. Left: Relative humidity [%]. Right: Field of temperature [°C](Own processing)

Relative humidity [%] of single-wall green roof-designed state is in Fig. 3 on the left. Range of humidity is 20%-100%. Minimum humidity is between 20% and 28%, maximum between 92% and 100%. Interior conditions: air temperature 20°C and humidity 50%. Exterior conditions: air temperature -15°C and humidity 84%.

Field of temperature [°C] of single-wall green roofdesigned state is in Fig. 3 on the right. Range of temperature is between -14,90°C and 20,0°C. Isothermal line of the required lowest surface temperature (12,83°C) is in Fig. 3. Point of minimum exterior surface temperature (-14,86°C) and point of minimum interior surface temperature (19,04°C) is in Fig. 3 on the right.

In accordance with STN [10] standard till year 2015, U=0,1 $[W/m^2.K]$.



Figure 4: Single-wall green roof. Condensation area [at θe=-15°C] and Vapour Flow [kg/m.s]Left: current state. Right: designed state (Own processing)

Condensation area [at $\theta = -15^{\circ}$ C] and Vapour Flow [kg/m.s] of single-wall green roof-current state is in Fig. 4 on the left, of single-wall green roof-designed state is on the righ.

Vapour Flow into the current construction is 4,12.10-9 kg/m.s, out of construction is 1,24.10-11 kg/m.s. Vapour Flow into the designed construction is 3,69.10-9 kg/m.s, out of construction is 5,46.10-12 kg/m.s.



Figure 5: Single-wall green roof. Left: current state. Right: designed state (Own processing)

Double-wall green roof-current state section is in Fig. 5 on the left, layers are described in Tab.2. Double-wall green roof-designed state section is in Fig. 5 on the right, layers are described in Tab.2. Following the static analyses, spacing between rafters is 800 mm.

Table 2 Double-wall green roof (Own processing)

	LAYER	C.STATE	D. STATE
1	vegetation	-	-
2	reinforced strengthened substrate	20 mm	150 mm
3	filtering – protecting layer	1 mm	1 mm
4	water holding – drainage layer	7 mm	25 mm
5	root barrier membrane	1,7 mm	1,7 mm
6	roof deck - load bearing structure	24 mm	60 mm
7	open aeration layer	40 mm	50 mm
8	insured damp proof course	0,7 mm	0,7 mm
9	thermal insulation between rafters	200 mm	370 mm
	(under rafters 40 mm/180 mm)		
10	vapour barrier	0,7 mm	0,7 mm
11	roof deck - load bearing structure	24 mm	60 mm
12	closed aeration layer	35 mm	50 mm
13	flashing batten across the gutter	-	-
14	lower ceiling	12 mm	12 mm
15	load bearing roof structure	-	-
16	flashing batten parallel to the gutter	-	-
17	antierosion protection profile	-	-



Figure 6: Double -wall green roof-current state. Left: Relative humidity [%]. Right: Field of temperature [°C](Own processing)

Relative humidity [%] of double-wall green roof-current state is in Fig. 6 on the left. Range of humidity is 9%-87%. Minimum humidity is between 9% and 17%, maximum between 79% and 87%. Interior conditions: air temperature 20° C and humidity 50%. Exterior conditions: air temperature -15°C and humidity 84%.

Field of temperature [°C] of double-wall green roofcurrent state is in Fig. 6 on the right. Range of temperature is between -15,00°C and 18,40°C. Isothermal line of the required lowest surface temperature (12,83°C) is in Fig. 6. Point of minimum exterior surface temperature (-15,00°C and -12,77°C) and point of minimum interior surface temperature (17,72°C) is in Fig. 6 on the right.

In accordance with STN [10] standard till year 2015, U=0,2 $[W/m^2.K]$.



Figure 7: Double -wall green roof-designed state. Left: Relative humidity [%]. Right: Field of temperature [°C](Own processing)

Relative humidity [%] of double-wall green roof-designed state is in Fig. 7 on the left. Range of humidity is 9%-89%. Minimum humidity is between 9% and 17%, maximum between 81% and 89%. Interior conditions: air temperature 20° C and humidity 50%. Exterior conditions: air temperature -15° C and humidity 84%.

Field of temperature [°C] of double-wall green roofdesigned state is in Fig. 7 on the right. Range of temperature is between -15,00°C and 19,10°C. Isothermal line of the required lowest surface temperature (12,83°C) is in Fig. 7. Point of minimum exterior surface temperature (-15,00°C and -12,69°C) and point of minimum interior surface temperature (19,00°C) is in Fig. 7 on the right.

In accordance with STN [10] standard till year 2015, U=0,1 [W/m².K].

4. Triple-wall green roof



Figure 8: Triple-wall green roof. Left: current state. Right: designed state (Own processing)

Triple-wall green roof-current state section is in Fig. 8 on the left, layers are described in Tab.3. Triple-wall green soped roof-designed state section is in Fig. 8 on the right, layers are described in Tab.3. Following the static analyses, spacing between rafters is 800 mm.

Table 3 Triple-wall green roof (Own processing)

	LAYER	C.STATE	D. STATE
1	vegetation	-	-
2	reinforced strengthened substrate	20 mm	150 mm
3	filtering – protecting layer	1 mm	1 mm
4	water holding – drainage layer	7 mm	25 mm
5	root barrier membrane	1,7 mm	1,7 mm
6	roof deck - load bearing structure	24 mm	60 mm
7	open aeration layer	35 mm	35 mm
8	flashing batten across the gutter	-	-
9	insured damp proof course	0,7 mm	0,7 mm
10	roof deck - load bearing structure	24 mm	60 mm
11	open aeration layer	40 mm	50 mm
12	flashing batten across the gutter	-	-
13	thermal insulation between rafters		
	(under rafters 40 mm/180 mm)	200 mm	370 mm
14	vapour barrier	0,7 mm	0,7 mm
15	roof deck - load bearing structure	24 mm	60 mm
16	closed aeration layer	35 mm	50 mm
17	flashing batten across the gutter	-	-
18	lower ceiling	12 mm	12 mm
19	load bearing roof structure	-	-
20	flashing batten parallel to the gutter	-	-
21	antierosion protection profile	-	-



Figure 9: Triple -wall green roof-current state. Left: Relative humidity [%]. Right: Field of temperature [°C](Own processing)

Relative humidity [%] of triple-wall green roof-current state is in Fig. 9 on the left. Range of humidity is 9%-84%. Minimum humidity is between 9% and 16%, maximum between 77% and 84%. Interior conditions: air temperature 20°C and humidity 50%. Exterior conditions: air temperature -15° C and humidity 84%.

Field of temperature [°C] of triple-wall green roof-current state is in Fig. 9 on the right. Range of temperature is between -15,00°C and 18,40°C. Isothermal line of the required lowest surface temperature (12,83°C) is in Fig. 9. Point of minimum exterior surface temperature (-15,00°C and -12,77°C) and point of minimum interior surface temperature (17,71°C) is in Fig. 9 on the right.

In accordance with STN [10] standard till year 2015, U=0,2 [W/m².K].



Figure 10: Triple -wall green roof-designed state. Left: Relative humidity [%]. Right: Field of temperature [°C](Own processing)

Relative humidity [%] of triple-wall green roof-designed state is in Fig. 10 on the left. Range of humidity is 9%-89%. Minimum humidity is between 9% and 17%, maximum between 81% and 89%. Interior conditions: air temperature 20°C and humidity 50%. Exterior conditions: air temperature -15°C and humidity 84%.

Field of temperature [°C] of triple-wall green roofdesigned state is in Fig. 10 on the right. Range of temperature is between $-15,00^{\circ}$ C and $19,10^{\circ}$ C. Isothermal line of the required lowest surface temperature ($12,83^{\circ}$ C) is in Fig. 10. Point of minimum exterior surface temperature ($-15,00^{\circ}$ C and $-12,69^{\circ}$ C) and point of minimum interior surface temperature ($19,00^{\circ}$ C) is in Fig. 10 on the right.

In accordance with STN [10] standard till year 2015, U=0,1 [W/m².K].

6. Conclusions

Green roofs have definitely positive impact on surrounding environment. They bring many invaluable positives to their customers and improve the quality of their lives. Realizations of green flat or sloped roofs intervene human contact with wildness in the middle of urban environment. This paper is pointing at three different constructive solutions of green roofs- current state and designed state. The aim of this paper involves an analysis of the thermotechnical parameters of a building with a green roof in accordance with the STN standard. Thermal transmittance and lowest surface temperature in steady state boundary conditions of the roofs are in accordance with the STN standard

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References

 Yeang K., Spector A.: Green design. From theory to practice, Black dog publishing, London, p. 7-12, 2011
 Jodidio P.: Green architecture now!, Taschen, Cologne, p. 6-18, 2009

[3] Dunnett N. et al.: Small green roofs, Timber press, Portland*Lodon, p.8-13, 2011

[4] Somerville N et al.: Sustainability with style: The ASLA headquarters green roof (2007). http://www.asla.org /uploadedFiles/CMS/Green_Roof/SustainabilityWith Style.pdf (2014-02-28)

[5] Katunská, J., Tóth, S.: Šikmé jedno a viacplášťové vegetačné strechy (Single-wall and multi-wall vegetative sloped roofs). Materiály pro stavbu. 18 (2012) p. 18-20.

[6] Katunský, D., Tóth, S., Vašková, A.: Riešenie možností začlenenia vegetačných striech v regióne krajín V4 - náplň Vyšehradského strategického programu (Solution of green roof structures in V4 countries – V4 project extension). Solution of Green Roof Structures in V4 Countries. 1 (2010) 1-7.

[7] Mikuláš, M., Oláh, J.: Krytiny a doplnkové konštrukcie striech (Roof coverings and supplemental roof constructions). Jaga group, Bratislava, 2001

[8] Mikuláš, M., Mikulášová, M., Oláh, J.: Šikmé střechy (Sloped roofs). Jaga group, Bratislava, 2002

[9] Oláh, J.: Navrhovanie striech. Základné ustanovenia (Designing of roofs. Basic provisions). Slovenský ústav technickej normalizácie, Bratislava, 2005

[10] STN 73 0540, 1-3: Thermal protection of buildings. Thermal performance of buildings and components. Part 1: Terminology, Part 2: Functional requirements, Part 3: Properties of environments and building products, SUTN 2012. [in Slovak].

[11] Flimel M., Differences Ug - values of glazing measured in situ with the influence factors of the internal environment, 2013, In: Advanced Materials research. Vol 649 (2013), p. 61-64 ISBM 978-03785-596-6

[12] Flimel M., Interactions of the artificial light sources and the window glazing of buildings, 2013, In: Przegląd Elektrotechniczny. Vol 8 (2013), p. 100-103 ISBM 0033-2097

DOGHOUSE WITH GREEN ROOF AND ITS POSSIBILITIES IN TERMS OF MICROURBANISM

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Abstract: Claim of this article is to show small green roof features in little urban scale. Green roofs are on the agenda worldwide. It is caused because of many challenges. Green roofs could be unique infrastructures of our cities. This article is about realized small green roof, little doghouse. Doghouse, its constructive solution and the most important - green top. Project of this doghouse is really largely symbolic when we compare it with standard big top of the building.

Keywords: construction, doghouse, green roof, medium, monitoring possibilities, plant.

1. Introduction

The sense of giving nature back what we have inherited, putting plants and nature back into the hard and stark environment full of concrete, bituminous and unnatural surfaces touches something deep within us. It doesn't matter if the roof or wall is big or small, it is an act. Act full of symbolism and deep meaning.

Bringing nature into cities and urban dwellings has always been a very desirable amenity of urban planners and architects. Many masterplans with lots of green areas and free spaces were representing symbolic meaning of people owning land. Being close to nature, able to touch the tree, walk barefoot on the grass has so deep meaning and idea for every human that it sets to zero all the negatives.

The act of greening a building, act of greening a bus stop, kiosk, placing garden on existing building makes deep statement about the way we see, or the way we should see the world. Buildings with green tops should become fascinating objects. Grass and vegetation has on earth its natural horizontal space. So why should it be a problem putting soil on top of the building and have things growing. There is something strange about it, more than ecological. This reconciles humans with nature [1].

The truth is that for most of us, all this may seem very idealistic. To put a garden on our garage. Why not. But this is where it should start. Lots of joy, beautiful gardens, small domestic green roofs or sheds, garden offices, studios, bicycle sheds and other small structures. This article is about installing, constructing and planting a green roof on a little doghouse (Fig. 1), an opportunity to bring nature back to a place where it has been.

2. Plants

Plant specification marries up the expertise of growers, designers and horticulturists with the site specifications producing a list of plants creating nice design of the site. Combined processes of bidding, purchasing, installing, establishing, ongoing maintenance etc. are all contingent on each plant specification so special attention should be afforded to this phase of projecting extensive green roof [2].

Specification process should begin with functional and site specific questions. Where is the location. What are the light conditions. Is the irrigation going to be necessary. What is the height of the roof. How much weight is the construction going to be able to carry. Is the roof near some river or lake. Is the projected roof on an exposed or sheltered place. What about storm water management. How should the color scheme of projected extensive green roof look like.

Installed vegetation Sempervivum Jovibarba allionii (Fig.2), Sempervivum Tectorum (Fig. 3) and Sedum Spurium (Fig. 4) was used because of two main reasons. Economical reason: all used plants were taken directly from nature, meaning cheap version of having plants for free. Low/ no maintenance reason: used plants need low/ no maintenance and no irrigation.



Figure 1: Doghouse

2.1 Hardy succulents

Hardy succulents are the workhorses of extensive roofs and the primary plants for systems using a medium of 10, or less centimeters. They have unsurpassed ability to survive drought and wind conditions, store water in their leaves for extended periods and conserve water through a unique metabolic process. Hardly succulents like Sempervivum Jovibarba allionii, Sempervivum tectorum and Sedum spurium are one of the choices for thin substrate, non-irrigated, extensive green gardens with the greatest survivability [2].

2.2 Plant establishment

Plant establishment is the key to green roof's longevity. If the establishment in the beginning is unsuccessful, time of the return of investments is going to be lengthened. It is very important and also much cheaper to ensure the plant establishment in the beginning or even before the realization of the roof. First weeks after installation are crucial. It is prudent to plant the plants early enough to allow plants to root in before the first frost. Trials performed at Penn State University on plant establishment showed that well-established plants were much more likely to survive winter and drought than plants that were poorly established [3].



Figure 2: Sempervivum Jovibarba Allionii

Plant establishment on the doghouse roof was ensured before the roof realization. Three types of used vegetation, Sempervivum Jovibarba allionii, Sempervivum tectorum and Sedum spurium, were prepared for being planted on the roof. One half of Sempervivum Jovibarba allionii and Sempervivum tectorum was planted in containers one week before planting plants on the roof of the doghouse. After moving these plants out of the container (one week period), new established root system of these plants was noticed. Another half of Sempervivum Jovibarba allionii and Sempervivum tectorum was planted on the roof directly after removing plants out of the soil they were growing in. Sedum spurium was planted on the roof directly after removing plants out of the soil they were growing in. The roof is exposed to the west, because of the plant choice.

After plant establishment, few minutes after finishing planting vegetation heavy rain came. To ensure that rain would not wash out the soil and freshly planted vegetation, roof was covered with plastic foil. When the rain was soft, plastic foil was removed and the roof was naturally watered with rainwater.

Another fact about any green roof is that it is always an experiment. No one can predict if the plant establishment will be successful or not. In this case, awkward situation happened after few days when missing plants were noticed. Seven Sempervivum Jovibarba Allionii plants from the very bottom part of the roof were missing. After a while of investigation, two were found on the ground and the dog was caught while playing and jumping up, trying to tear out another one. Proper care during establishment will provide achieving coverage in earlier date. Planting occurs regular irrigation. If planting occurs in areas with natural rainfall that is regular, irrigation may not be needed. On many installations on US East Coast, plants require no supplemental irrigation at all, not even upon planting. On the other hand, parts in North require care and everyday irrigation. Irrigation can be achieved through several methods: built in irrigation systems, lawns sprinklers, garden hoses. Irrigation need should be ascertained and used for the specific plants, location and time of year when the roof is being installed [2].

3. Medium

Medium depth and its greater depth means more diversity of used plants because of more options for growing roots of used plants. Composition of the underlying medium influences load of soil. This also means influencing plant specification in terms of weight, water absorption capacity, drainage rates etc. The ideal medium is lightweight, retaining water well, also porous and freely draining. The more water the medium retains, the more weight is being added to the roof. The medium supplies and absorbs nutrients, anchors the plants, provides enough weight to avoid floating when wet and avoids being flown off during establishment [1].



Figure 3: Sempervivum Tectorum

Medium depth used on the doghouse roof is constant 6cm. This was effected by two main reasons. Plant specification reason: used plants do not require deeper substrate depth. Construction reason: the doghouse was designed as a simple construction to support low load of soil. Before plants were installed, all engineer and protective works on the roof were completed to ensure avoiding potential damage to the plants. When the roof was ready for the planting, the medium was spread to the specific depth and thoroughly moistened. Plastic film was not be laid over the substrate, because it could have caused overheating the medium and affect planted plants later.

Generally, extensive green roof medium is a blend of sandy or granular materials that balances water absorption with adequate porous surface. A variety of natural and unnatural materials can be used to achieve balance. Lelite, pumice, diatomaceous earth, sand, expanded and active clays, expanded shale, gravel, bricks and tiles. And vermiculite or perlit can be used in conjunction with other materials [2]. But we need to face the fact that using these kinds of materials the green roof is going to be less environmental and more expensive than purely natural medium.

Medium used on the doghouse is purely organic with no artificial materials. Soil composition was designed for mostly economical reasons. In future, this green roof may be compared with another green roof with different roof layers. Medium is surrounded with layer of gravel. This layer is designed for winter season when soil expansion is possible. Gravel border is also making the roof look more fashionable and well designed.

More organic medium, more planting options are available. Predominantly organic medium is not recommended for extensive green roofs. Because of decreasing of pore space, higher water retention and increasing nutrient loading, reducing medium depth over time may be caused. Changing of medium depth may cause change of the designed roof, adding the substrate and changing environment of planted vegetation. Depth of medium should be constant over a long period of time and highly organic medium makes it impossible.



Figure 4: Sedum Spurium

4. Construction

Construction is simple. The doghouse disposition: vestibule and the dog's room. The construction consists of floor, five walls and the roof. Entry to the dog's room is inside the doghouse from the vestibule, under the roof. The roof is aisle with 220 slope. Floor dimension is 800x800 mm. Roof dimension is 1000x1000 mm. The roof is overhanging 100 mm the floor on each side. Height of the wall with the entrance is 450 mm, opposite wall height is 750 mm. Signature element of this roof is horizontal division into three parts. The division has aesthetical reasons but main reason of avoiding soil slide. There are holes in the construction bottom parts dividing the roof into three parts. These holes are ensuring water runoff during storm rainfall. Construction of the doghouse is made of 15 mm thick OSB boards. The dog's room is insulated with thermal insulation. Construction of the roof is described in Tab. 1.

	Table	1:	Roof	construction
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VEGETATION	-
SOIL	60 MM
300 G FILTER FABRIC	1,5 MM
WATER HOLDING	10 MM
DRAINAGE LAYER	10 MIM
WATERPROOF MEMBRANE	0,1 MM
WATERPROOF COATING	2 COATS OF PAINT
OSB BOARD	15 MM

5. Monitoring possibilities

Process to track can be: storm water retention, temperature, water quality and plant performance. Energy savings can not be monitored because of the building use as a doghouse. Water retention can be monitored. Kept liters out of the city sewer system can be monitored. Water quality. The green roof should not add any nitrogen to the runoff. Water quality testing should show that the water runoff contains fewer pollutants than typical water runoff. Most significantly, the roof should be reducing the amount of nitrogen entering the watershed. Temperature differences. The green roof should be cooler than conventional black roofs on neighborhood buildings. Temperature differences should be greatest on the hottest days. Temperature differences are a result of plants evaporation [4].

Small green roofs, when we talk about small green roofs in a small urban scale, they are very important for every city, every street, every district. When we compare them with standard black roof, their features are incomparable. What they do to air, water, people, psychology, aesthetic of the place. Physical, ecological, water runoff aspects are very significant. There are many green roofs features. Lowering surrounding air temperature through water evaporation. Lowering the presence of allergens. Cleaning air. Forming oxygen. Capturing CO2. Absorbing light smog. Creating new environment. Aesthetic factor of the green roof. Psychological effects. Lowering surrounding air and creating new living space. Visions of wood, meadow. Creating new living space. Water retention. Unloading surface drainage. Green roof aroma. Modern city design.

6. Conclusions

Ecological design is still very much in its infancy. More compact mixed-used neighbourhoods full of streets crossed with parks providing livable and healthy habitat for all living things in it. Totally green building or totally green city does not exist yet. There is so much theoretical work, technical research, environmental studies etc. that have to be done and tested before we can say that we have a green building, or dwelling. On the other hand, ecological design as we know it today, offers enormous potential to transform our buildings into products, systems. Urban roof like this is a very challenging place. Lofty ideas of potential acres of green spaces that lie above our cities. Roofs as lifeless place of bituminous surface, violent temperatures contrasts, bitter wind and antipathy to water. As it has been proved, they can be changed into non asphalt wasteland. When we go to the rooftops in cities, we usually look out for a view. Positive change happens in

case like this, when you don't have to look for a view, because it is in front of you. Unexpected green and blue grasses, pink and yellow flowers, roses and little trees in the middle of concrete, glass and steel.

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References

[1] Dunnett N. et al., 2011. Small green roofs, Timber press, Portland*Lodon, p.8-13

[2] Snodgrass, E. C., Green roof plants. Timber press, Portland*London, 2006

[3] Thuring, C. E., Green roof plant response to different media depth under various drought conditions. http://horttech.ashspublications.org/content/20/2/395.full (11-08-2014)

[4]Somerville N et al., 2007. Sustainability with style: The ASLA headquarters green roof. http://www.asla.org/uploadedFiles/CMS/Green_Roof/Sust

ainabilityWithStyle.pdf (11-08-2014)

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ON THE IDEALITY OF CROSS-CORRELATION PROPERTIES FOR COMPLETE COMPLEMENTARY CODES $(N, N, N^2 \times N^2)$ AND $(N, N, 2N \times 2N)$

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Abstract: Since the invention of Complete Complementary Codes (CCC), they attract researchers' attention due to their correlation properties. Recent generating algorithms and research on their bounds presented limitations of those codes. Several various approaches were designed aiming to overcome those boundaries. One of those is concurrent use of signatures with different order constructed by the same algorithm. In this paper the ideality of cross-correlation properties of one- and two-dimensional CCCs characterized by (N, N, N^2) is analyzed and discussed.

Keywords: Complete complementary code, CCC, mutually orthogonal complementary set, two-dimensional

1. Introduction

Since first mention of Complete Complementary Codes (CCC), they attract researcher's attention. These codes are highly interesting thanks to their ideal correlation properties. These unique codes found application in several scientific fields. The broadest proposed application is in telecommunication systems due to their ideal auto-correlation property highly suitable for simple identification and ideal cross-correlation property ensuring MAI free concurrent transmission of multiple users.

In 1949 Golay published [1] article in field of optical infrared, called multi-slit spectrometry, where he analyzed complementarity of selected binary sequences. The unique auto-correlation properties of proposed selected sequences caught researchers' attention that further developed those sequences [2]-[5]. In these contributions the given sequences were mostly concerned on auto-correlation properties. The possible ideality of cross-correlation properties was firstly proposed by Tseng and Liu [6]. Later on these sequences were termed Complete Complementary Codes (CCC) [3]-[5] afterwards. Development of CCC generating algorithms represents still a vivid area of research. Recently, a framework for a systematic construction of these codes was published [7].

Subsequently, authors in [8], [13] and [14] proposed a construction of two-dimensional CCCs (2D-CCC) where they used 1D-CCC with minimum element order of N^2 on input. Recently, this former construction was generalized [9] to enable acceptance of any of the recent 1D-CCC [7], [10], [11] on input. These research results led to construction of 2D-CCC with elements of smaller order.

Resulting signatures have smaller order of elements, which leads to higher number of signatures suited for concurrent transmissions in CDMA systems. This leads to increase of throughput and channel capacity [9].

Limiting bounds of ideal CCCs caused development of several approaches aiming to increase throughput via concurrent transmission using higher number of signatures stemming from 2D-CCCs with different orders was introduced in [7], [9]. In this paper next approach to use

signatures constructed by various generating algorithms concurrently is discussed.

The paper is organized as follows: An introduction to CCC is given in section 2. In section 3 the used constructions of analyzed codes are given. In section 4 the cross-correlation properties of analyzed 2D-CCCs are discussed. In Conclusion 5 the contribution of proposed approach is summarized.

2. CCC Definitions

2.1 1D-CCC

Discrete aperiodic cross-correlation function [15] $C_{p,r}$ is given as follows:

$$C_{p,r}(s) = \begin{cases} \sum_{u=0}^{T-1-s} a_u^{(p)} a_{u+s}^{(r)}, & 0 \le s \le T-1 \\ \sum_{u=0}^{T-1+s} a_u^{(p)} a_{u+s}^{(r)}, & 1-T \le s < 0 \\ 0, & |l| \ge T \end{cases}$$
(1)

where *s* denotes shift, *T* represents period of equally long distinguish sequences $(a_j^{(p)})$ and $(a_j^{(r)})$ of *p*-th and *r*-th users with chips from a {+1,-1}. If p=r, $C_{p,r}$ denotes discrete aperiodic autocorrelation function.

Signature denotes a sequence collection assigned to a user with zero autocorrelation function value when computed through all sequences for any nonzero shift. *Mutually orthogonal signatures* are two signature collections where every complementary pairs in the collections are mates of each other.

CCC signature sequences have to be transmitted via separate channels in order to allow computing of auto- and cross-correlations at receiver independently for each channel [12] followed by summarization of channel correlations in order to obtain ideal overall correlation properties. For this the definition of aperiodic autocorrelation function $\rho_{e^{(0)}}$ [15] has to be slightly modified in order to represents the computation through all sequences for one selected signature:

$$\rho_{\mathbf{c}^{(i)}}(\tau) = \sum_{l=0}^{L-1} \mathbf{c}^{(i)}(l) \left[\mathbf{c}^{(i)}(l+\tau) \right]^*;$$
(2)

where $c^{(i)}$ denotes a *L* long sequence and τ represents the shift.

The *aperiodic cross-correlation* function $\rho_{\mathbf{c}^{(i)},\mathbf{c}^{(j)}}(\tau)$ between two different sequences $\mathbf{c}^{(i)} \in C$ and $\mathbf{c}^{(j)} \in C$ where $i \neq j$:

$$\rho_{\mathbf{c}^{(i)},\mathbf{c}^{(j)}}(\tau) = \sum_{l=0}^{L-1} \mathbf{c}^{(i)}(l) \cdot \left[\mathbf{c}^{(j)}(l+\tau) \right]^{*};$$
(3)

Let's denote *i*-th signature in a set C of N signatures as:

$$\mathbf{c}^{(i)} = (\mathbf{c}_1^{(i)} \quad \mathbf{c}_2^{(i)} \quad \dots \quad \mathbf{c}_E^{(i)}); \quad i = 1, 2, \dots N , \qquad (4)$$

where each sequence:

$$\mathbf{c}_{k}^{(i)} = (c_{k,1}^{(i)} \quad c_{k,2}^{(i)} \quad \dots \quad c_{k,L}^{(i)}); \quad k = 1, 2, \dots E, \qquad (5)$$

is a *k*-th *element* of it with length *L*. Each element is a vector in which chips are symbols (usually complex numbers with amplitude one). For convenience of the reader chips ± 1 are used in this article.

CCC dispose of ideal aperiodic auto- and cross-correlation properties, thus (2) and (3) are equal to zero except for zero shift of aperiodic autocorrelation (2).

In [11] a 1D-CCC construction with L long element was proposed, where L is equal to 2N where N is maximal number of signatures and power of two. In practical applications minimizing L [12] whilst maximizing N is desired.

2.2 2D-CCC Definitions

Let **C** be a complex matrix of order *P* made of complex numbers c_{ij} whose absolute values $|c_{ij}|=1$:

$$\mathbf{C} = \begin{bmatrix} c_{11} & c_{12} & \dots & c_{1P} \\ \cdots & & & \\ c_{P1} & c_{P2} & \dots & c_{PP} \end{bmatrix}$$
(6)

 M_{2D} sets of N_{2D} matrices

$$\left\{ \mathbf{C}_{1}^{(1)}, \mathbf{C}_{2}^{(1)}, ... \mathbf{C}_{N_{2D}}^{(1)} \right\}, ... \left\{ \mathbf{C}_{1}^{(M_{2D})}, \mathbf{C}_{2}^{(M_{2D})}, ... \mathbf{C}_{N_{2D}}^{(M_{2D})} \right\}$$
(7)

compose a 2D-CCC of order M_{2D} when their autocorrelation function is zero except for zero shift computed through all elements of a signature and crosscorrelation is zero between two different signatures computed through all elements. The auto- and crosscorrelation functions are defined in Appendix A (22) and (23), respectively. A set of N_{2D} matrices { $\mathbf{C}^{(i)}_{1}$, $\mathbf{C}^{(i)}_{2}$,..., $\mathbf{C}^{(i)}_{N2D}$ } is termed *i*-th signature of 2D-CCC. A matrix $\mathbf{C}^{(i)}_{j}$ is termed the *j*-th element of *i*-th signature.

3. Processed construction algorithms **3.1 1D-CCC** (*M*, *N*, *N*²) algorithm [10]

Base for this construction is matrix constructed of three unitary-like matrixes **E**, **F**, **G** as follows:

$$\mathbf{H} = (\mathbf{F} \otimes \mathbf{G}).diag(Vec(\mathbf{E})) \tag{8}$$

where \otimes represents Cronecker product and unitary-like matrix fulfills condition given in (9)

$$\mathbf{U}_{N}\mathbf{U}_{N}^{H} = \mathbf{U}_{N}^{H}.\mathbf{U}_{N} = \alpha.\mathbf{I}_{N}$$
⁽⁹⁾

where $\alpha > 0$, \mathbf{I}_N denotes $N \times N$ identity matrix, where N is matrix order and power of two and \mathbf{U}_N represents unitary matrix if $\alpha = 1$.

Vec operator reorders matrix **A** into vector compiled of column and *diag* operator constructs a zero matrix but a vector $\mathbf{a}=(a_0, a_1, ..., a_{N-1})$ in diagonal:

$$vec(\mathbf{A}) = \begin{bmatrix} \mathbf{a}^{0} \\ \mathbf{a}^{1} \\ \vdots \\ \mathbf{a}^{N-1} \end{bmatrix}$$
(10)

$$diag(\mathbf{a}) = \begin{bmatrix} a_0 & 0 & \cdots & 0 \\ 0 & a_1 & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & a_{N-1} \end{bmatrix}$$
(11)

A set of sequences can be generated out of lines of **H** matrix as follows:

$$S = [\Xi^{m}]_{m=0}^{N-1} = [\mathbf{s}_{n}^{m}(i)]_{m=0,n=0}^{N-1,N-1} = \left[\sum_{l=0}^{N^{2}-1} h_{nN+k}^{l} \delta(i-l)\right]_{m=0,n=0}^{N-1,N-1}$$
(12)

for $0 \le m, n \le N - 1$ and \mathbf{S}^{m} denotes a complete complementary set of sequences with parameters (N, N, N^{2}) .

3.2 1D-CCC (*M*, *N*, 2*N*) algorithm [11]

The following construction consists of two steps. First step describes construction of generation matrix Δ . Second step describes cross-concatenation where the resulting overall matrix concludes all sequences.

Generation matrix is composed of two input unitary-like matrices A and B defined as follows:

$$\mathbf{A} = \begin{bmatrix} \mathbf{a}_{0} \\ \mathbf{a}_{1} \\ \vdots \\ \mathbf{a}_{N-1} \end{bmatrix} = \begin{bmatrix} a_{0}^{0} & a_{0}^{1} & \cdots & a_{0}^{N-1} \\ a_{1}^{0} & a_{1}^{1} & \cdots & a_{1}^{N-1} \\ \vdots & \vdots & \ddots & \vdots \\ a_{N-1}^{0} & a_{N-1}^{1} & \cdots & a_{N-1}^{N-1} \end{bmatrix}$$
(13)

$$\mathbf{B} = \begin{bmatrix} b_n^m \end{bmatrix} \tag{14}$$

where $|a_n^m|=1$, $|b_n^m|=1$, $0 \le n$, $m \le N-1$. Submatrices Δ_0 , $\Delta_1 \ldots \Delta_{N-1}$ of generation matrix Δ are then defined:

$$\Delta_{i} = \mathbf{B}.diag(\mathbf{a}_{n}) \tag{15}$$

The generation matrix is constructed as follows:

$$\Delta = \begin{bmatrix} \Delta_0 \\ \Delta_1 \\ \vdots \\ \Delta_{N-1} \end{bmatrix}$$
(16)

The 1D-CCC is generated through cross-concatenation in following manner:

$$\mathbf{D} = cross^{j}(\Delta) = \begin{vmatrix} \Delta_{\mathbf{0}} & \circ & +\Delta_{1} \\ \Delta_{\mathbf{0}} & \circ & -\Delta_{1} \\ \Delta_{2} & \circ & +\Delta_{3} \\ \Delta_{2} & \circ & -\Delta_{3} \\ \vdots & \vdots & \vdots \\ \Delta_{N-2} & \circ & +\Delta_{N-1} \\ \Delta_{N-2} & \circ & -\Delta_{N-1} \end{vmatrix}$$
(17)

3.3 2D-CCC (*N*, *N*, *L*×*L*) algorithm [9]

Let $\mathbf{C}_{n_{2D}}^{(k_{2D})}$ denote the n_{2D} -th element of the k_{2D} -th signature of the new 2D-CCC. It is a matrix with order *P*. Let $\mathbf{c}_{n_{2D},i}^{(k_{2D})}$ denote its *i*-th row *i*=1,2,...,*P*, *P*=*L* where *L* denotes the length of 1D-CCC.

Each element of 2D-CCC signature is composed of rows obtained using following equation:

$$\mathbf{c}_{n_{2D},i}^{(k_{2D})} = \mathbf{c}_{[(n_{2D}-1) \mod N_{1D}]+1}^{(k_{2D}-1) \mod N_{1D}]+1} \times c_{\nu,i}^{(t)}$$
(18)

$$k_{2D}=1,2,\ldots,M_{1D}^{2}$$
 (19)

$$n_{2D}=1,2,\ldots,N_{1D}^{2}$$
 (20)

$$v = \left\lfloor \frac{n_{2D} - 1}{N_{1D}} + 1 \right\rfloor, \quad t = \left\lfloor \frac{k_{2D} - 1}{M_{1D}} + 1 \right\rfloor$$
(21)

where $\lfloor x \rfloor$ is the greatest integer, which is equal or smaller than *x*, M_{1D} and N_{1D} denote number of signatures and elements of inputted 1D-CCC.

4. Cross-Correlation Properties

Aiming to increase channel efficiency, thus the increase of concurrently communicating users, several approaches are researched. In this article the concurrent use of CCCs constructed by different generating algorithms is analyzed. Ideal auto- and cross-correlation properties cause these codes representing a unique tool for ease identification of user and enable concurrent use of the same transmitting medium and domain by multiple users whilst ensuring MAI free transmission. Construction algorithms generate limited numbers of signatures where the maximal number of concurrent transmitting users is given by signature count. To overcome this limiting border, the use of multiple distinguish CCCs is researched.

Whilst using brute force in computing all possible combinations of given two CCC families, the possible use of selected signatures has been discovered. Table 1 shows signatures with depicted element order of first (N, N, $N^2 \times N^2$) and second code (N, N, $2N \times 2N$) for 4 signatures.

As visible in the results, the cross-correlation property strongly depends on the element arrangement. For not mentioned arrangements, no ideal cross-correlation properties between signatures were detected.

Table 1 Signatures of (4, 4,16×16) and (4, 4,8×8) with ideal cross-correlation properties for following element arrangements of 2nd code: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 9 10 11 12 13 14 15 16 1 2 3 4 5 6 7 8 3 4 1 2 7 8 5 6 11 12 9 10 15 16 13 14

(4, 4, 16×16)	(4 , 4 , 8 ×8)
1, 3, 9, 11	2, 4, 5, 6, 7, 8, 10, 12, 13, 14, 15, 16
2, 4, 10, 12	1, 3, 5, 6, 7, 8, 9, 11, 13, 14, 15, 16
5, 7, 13, 15	1, 2, 3, 4, 6, 8, 9, 10, 11, 12, 14, 16
6, 8, 14, 16	1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 15

 Table 2 Signatures of (4, 4,16×16) and (4, 4,8×8)

 with ideal cross-correlation properties for following

 element arrangements of 2nd code:

 2 1 4 3 6 5 8 7 10 9 12 11 14 13 16 15

 4 3 2 1 8 7 6 5 12 11 10 9 16 15 14 13

(4, 4, 16×16)	(4, 4, 8×8)
1, 2, 3, 4, 9, 10, 11, 12	5, 6, 7, 8, 13, 14, 15, 16
5, 6, 7, 8, 13, 14, 15, 16	1, 2, 3, 4, 9, 10, 11, 12

 Table 3 Signatures of (4, 4,16×16) and (4, 4,8×8)

 with ideal cross-correlation properties for following

 element arrangements of 2nd code:

 5 6 7 8 1 2 3 4 13 14 15 16 9 10 11 12

 10 9 12 11 14 13 16 15 2 1 4 3 6 5 8 7

(4, 4, 16×16)	(4, 4, 8×8)
1, 3, 5, 7, 9, 11, 13, 15	1, 3, 5, 7, 9, 11, 13, 15
2, 4, 6, 8, 10, 12, 14, 16	2, 4, 6, 8, 10, 12, 14, 16

First table shows the best possible arrangements for concurrent use of analyzed generating families, where the ideal cross-correlation is maintained for the broadest amount of signatures. The following tables shows possible use of (4, 4, 8x8) with (4, 4, 16x16) where the concurrent transmission in the same channel can occur just with selected signature groups. All other combinations lose ideality of cross-correlation properties and are not suitable for concurrent transmission over the same channel.

With brutal force various combinations of signatures and elements were investigated considering solely mentioned constructions. Investigated were various cases of element arrangements. Due to limitations given to this paper, remaining research results can be delivered on demand.

5. Conclusion

In this paper the use of given codes for equal number of users in each code was analyzed. Possible use of different CCCs constructed by various algorithms was discovered. This enables concurrent transmission of higher number of users, thus increases channel efficiency.

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References

[1] M. J. E. Golay, *Multislit spectrometry*, J. Opt. Sot. Amer., vol. 39, p. 437, 1949

[2] R. Turyn, *Ambiguity Function of Complementary Sequences*, Information Theory IEEE Transaction, vol. IT-9, pp. 46-47, 1963

[3] Y. Taki, H. Miyakawa, M. Hatori and S. Namba, *Even-shift Orthogonal Sequences*, IEEE Transactions Information Theory, vol. IT-15, pp. 295-300, 1969

[4] R. Sivaswamy, *Multiphase Complementary Codes*, IEEE Transaction, Information Theory, vol. IT-24, pp. 546-552, 1978

[5] R. L. Frank, *Polyphase Complementary Codes*, IEEE Transaction, Information Theory, vol. IT-26, pp. 641-647, 1980

[6] C. C. Tseng and C. L. Liu, *Complementary Sets of Sequences*, IEEE Transaction, Information Theory, vol. IT-18, pp. 664-652, 1972

[7] H. Chenggao, N. Suehiro and T. Hashimoto, *A Systematic Framework for the Construction of Optimal Complete Complementary Codes*, Information Theory, IEEE Transactions on , vol.57, no.9, pp.6033-6042, Sept. 2011

[8] P. Farkaš and M. Turcsány, *Two-Dimensional* Orthogonal Complete Complementary Codes, Joint 1st

Workshop on Mobile Future & Symposium on Trends in Communications, Bratislava, pp. 21-24, Oct. 2003

[9] M. Davidekova, P. Farkas and E. Ruzicky, *Generalized construction of two-dimensional complete complementary codes*, Telecommunication and Signal Processing (TSP), 2013 36th International Conference on, vol., no., pp.747-750, 2-4 July 2013

[10] N. Suehiro, *Complete Complementary Code Composed of N-Multiple Shift Orthogonal Sequences*, Transaction IEICE, vol. J65-A, pp. 1247-1255, 1982

[11] C. Zhang, C. Han, Y. Liao, X. Lin and M. Hatori, *Iterative Method for Constructing Complete Complementary Sequences with Lengths of 2^mN*, Tsinghua Science and Technology, vol. 10, no. 5, pp. 605-609, Oct. 2005

[12]H.-H. Chen, J.-F. Yeh, N. Suehiro, A multicarrier CDMA architecture based on orthogonal complementary codes for new generations of wideband wireless communications, Communications Magazine, IEEE, vol.39, no.10, pp.126-135, Oct 2001 doi: 10.1109/35.95612

[13] P. Farkaš and M. Turcsány, *Two-dimensional quasi* orthogonal complete complementary codes, Mobile Future and Symposium on Trends in Communications, 2003. SympoTIC '03. Joint First Workshop on , vol., no., pp. 37-40, 26-28 Oct. 2003

[14] P. Farkaš, M. Turcsány and H. Bali, *Application of 2D Complete Complementary Orthogonal Codes in 2D-MC-SS-CDMA*. In Proc.: Wireless Personal Multimedia Communications - WPMC'04, Abano Terme Italy, September 12-15, 2004, Vol. 2, pp. 403-407

[15] M. Pursley, *Performance Evaluation for Phase-Coded Spread-Spectrum Multiple-Access Communication--Part I: System Analysis*, IEEE Transactions, vol. C-25, no.8. IEEE, pp 795-799, 1977.

Appendix A: Two-Dimensional Correlation Functions

$$\boldsymbol{\rho}(\mathbf{C},o,p) = \begin{cases} \frac{1}{M.N} \sum_{k=1}^{M-o} \sum_{l=1-p}^{N-p} \mathbf{c}_{kl} \cdot \mathbf{c}^*_{(k+o)(l+p)} & \text{for } o = 0,1,...M-1; p = 0,1,...N-1 \\ \frac{1}{M.N} \sum_{k=1-o}^{M-o} \sum_{l=1-p}^{N} \mathbf{c}_{kl} \cdot \mathbf{c}^*_{(k+o)(l+p)} & \text{for } o = 0,1,...M-1; p = -N+1,...-1 \\ \frac{1}{M.N} \sum_{k=1-o}^{M} \sum_{l=1-p}^{N-p} \mathbf{c}_{kl} \cdot \mathbf{c}^*_{(k+o)(l+p)} & \text{for } o = -M+1,...-1; p = 0,1,...N-1 \\ \frac{1}{M.N} \sum_{k=1-o}^{M} \sum_{l=1-p}^{N} \mathbf{c}_{kl} \cdot \mathbf{c}^*_{(k+o)(l+p)} & \text{for } o = -M+1,...-1; p = -N+1,...-1 \end{cases}$$
(22)

where \mathbf{c}_{ii}^* is the complex conjugate of \mathbf{c}_{ii} .

$$\boldsymbol{\rho}(\mathbf{C}^{(x)}, \mathbf{C}^{(y)}, o, p) = \begin{cases} \frac{1}{M.N} \sum_{k=1}^{M-o} \sum_{l=1-p}^{N-p} \mathbf{c}_{kl}^{(x)} \mathbf{c}_{(k+o)(l+p)}^{(y)*} & \text{for } o = 0, 1, \dots, M-1; p = 0, 1, \dots, N-1 \\ \frac{1}{M.N} \sum_{k=1}^{M-o} \sum_{l=1-p}^{N} \mathbf{c}_{kl}^{(x)} \mathbf{c}_{(k+o)(l+p)}^{(y)*} & \text{for } o = 0, 1, \dots, M-1; p = -N+1, \dots, -1 \\ \frac{1}{M.N} \sum_{k=1-o}^{M} \sum_{l=1-p}^{N-p} \mathbf{c}_{kl}^{(x)} \mathbf{c}_{(k+o)(l+p)}^{(y)*} & \text{for } o = -M+1, \dots, -1; p = 0, 1, \dots, N-1 \\ \frac{1}{M.N} \sum_{k=1-o}^{M} \sum_{l=1-p}^{N} \mathbf{c}_{kl}^{(x)} \mathbf{c}_{(k+o)(l+p)}^{(y)*} & \text{for } o = -M+1, \dots, -1; p = -N+1, \dots, -1 \end{cases}$$
(23)

where \mathbf{c}_{ij}^* is the complex conjugate of \mathbf{c}_{ij} .

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THE ALBUMIN ADSORPTION INFLUENCE ON ZETA POTENTIAL VALUES OF CHROMIUM(III) OXIDE, SILICA AND ZIRCONIA PARTICLES

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Abstract: Adsorption of macromolecular compound effects on the suspension electrokinetic properties, among others, the value of the solid particle zeta potential. In this work, the influence of the human serum albumin (HSA) adsorption on the zeta potential of chromium(III) oxide (Cr_2O_3) , silica (SiO_2) and zirconia (ZrO_2) particles was determined. Experimental works started with determining the HSA adsorption amount on the surfaces of selected metal oxides. The obtained results showed that the albumin adsorbs on the surface of each mineral oxide throughout the whole examined range of solution pH. In each case, the highest adsorption level was observed at pH 4.6, i.e. at pH value close to the HSA isoelectric point (pI). The albumin presence in the system causes the changes in the solid particle electrokinetic potential. Then the pH_{iep} (point of zero charge) value of chromium(III) oxide is about 5, whereas the above point of silica and zirconia is approximately 6. This means that the albumin makes the adsorbent surface properties similar to those of HSA.

Keywords: adsorption, HSA, silica, zeta potential, zirconia

1. Introduction

The protein adsorption on solid surfaces is a problem worthy of attention for every scientist involved in the physical chemistry of solid surfaces. This process has various practical applications in many industries. For example, in medicine, the implant acceptance by the body depends on the course of albumin adsorption on the implant surface. In recent years, implants are often cover with mineral oxides, because they are chemically passive and confer corrosion resistance. Moreover, the above coatings are less reactive to biological media and they are characterized by biocompatibility with the metallic surfaces [1-4]. Therefore, we should be focused on the albumin adsorption on the mineral oxide surface.

In this work, the effect of the human serum albumin (HSA) adsorption on the zeta potential of particles of three mineral oxides: chromium(III) oxide (Cr_2O_3) , silica (SiO_2) , zirconia (ZrO_2) , was investigated. Knowledge of zeta potential values of the solid in the macromolecular compound presence is very important. It allows to interpret the results of adsorption measurements as well as it is helpful in determining the stability mechanism of the mineral oxide suspension [5]. As part of this work the adsorption neasurements were also made. They concerned the the adsorption level of human serum albumin on the mineral oxide surface as a function of solution pH. The presented results are part of the study on the stability mechanism of the mineral oxide suspension in the polymer and biopolymer presence [6-8].

The choice of the adsorbents used in the experiments was dictated by their extensive use in industry. Chromium(III) oxide is the most stable green dye used in glass and ceramic industries, construction, painting, etc. [9]. Silica is used for the manufacture of quartz glass and silicagel, which is a drying agent and the stationary phase in chromatography [10]. In turn, zirconia is among other things used in dental prosthetics [11].

2. Materials

Three adsorbents were used in the experiments, i.e. chromium(III) oxide, zirconia and silica.

Chromium(III) oxide, produced by *POCh* company, is a finely crystalline gray-green solid. The specific surface area of Cr_2O_3 is 7.12 m²/g, adsorbent average pore diameter is 93.25 Å (BET method) [7].

Silica, produced by *Sigma-Aldrich* company, is a white powder. The specific surface area of the metal oxide, is $261.7 \text{ m}^2/\text{g}$ (BET method). Based on the Barret, Joyner and Halenda (BJH) method, it was found that there are no micropores in the SiO₂ sample [12].

Zirconia, produced by *Sigma-Aldrich* company, is a white solid. Its specific surface area is equal to $21.7 \text{ m}^2/\text{g}$ and the adsorbent average pore diameter 310.5 Å (BET method). Characteristics of the adsorbents are summarized in table 1.

Table 1 Characteristics of the adsorbents

Name	Formula	$S_{BET} [m^2/g]$	$D_p \left[\mathring{A} \right]$
Chromium(III) oxide	Cr_2O_3	7.12	93.25
Silicon oxide, silica	SiO ₂	261.7	-
Zirconium oxide, zirconia	ZrO_2	21.7	310.5

Human serum albumin (HSA) was used as adsorbate in the experiments. Its mass is about 66 kDa and isoelectric point of approximately 4.7-4.9. It consists of 585 amino acids of which alanine, leucine and charged amino acids, such as glutamic acid, aspartic acid and lysine residues, are particularly numerous. Probably, at nutral pH α -helix accounts for 48% and β -sheet represents 15% of the HSA chain. Human serum albumin is classified as soft potein, i.e. protein of low internal stability [13].

3. Methods

All measurements were carried out at room temperature. 0.01M NaCl was used as supporting electrolyte.

Albumin adsorption amount was determined by the difference of the protein concentration before and after the adsorption process. The HSA concentration was determined spectrophotometrically (UV-Vis) at the wavelength at which the albumin has the maximum absorbance, i.e. 279 nm.

The measurements started with drawing up calibration curves showing the dependence of absorbance on the albumin concentration. Then the solutions (10 cm³) were prepared containing a certain albumin amount (50 - 500 ppm). To each of them the appropriate amount of adsorbent (0.1 g of Cr_2O_3 , 0.0085g of SiO₂ and 0.05g of ZrO₂) was added. Weight of the solids was calculated taking into account their surface areas. After determining the specific pH values (3, 4.6, 7.6 and 9 \pm 0.1) the adsorption was performed for 1.5 h. During the process the suspensions were continuously shaken (120 rpm / min). The adsorption time was determined on the basis of the earlier measurements of the process kinetics. After process completion the suspensions were centrifuged (8000 rpm) and the albumin concentration in the supernatant was measured.

The zeta potential measurements were carried out using a zetameter Zetasizer Nano-ZS (*Malvern Instruments*). The apparatus was equipped with a titrator which allows to automatic solution pH determination during the measurement. Zetameter determines the zeta potential of colloidal particles moving in electric field on the steady level of electrophoretic cell. The measure is made automatically when the particle movement is compensated for by the applied voltage. According to Smoluchowski, the speed (u) of the colloidal particles moving in the electric field is associated to the zeta potential (ζ) by the equation:

$$\varsigma = \frac{\alpha u}{DF} \eta$$

where, $\alpha = \text{factor depending on the particle shape (for spherical particles <math>\alpha = 6\pi$, for cylindrical $\alpha = 4\pi$), D = dielectric constant, F = electric field strength, $\eta = \text{viscosity.}$

Initially, electrokinetic potential of the adsorbent particles without the albumin was measured. Then, the systems containing HSA (100 ppm) were examined. The suspensions were prepared by adding 0.03 g of Cr_2O_3 , 0.01g of SiO₂ or 0.0055g of ZrO₂ to the appropriate solution. Each sample was sonicated for 3 minutes before the measurement.

4. Discussion

Polymer adsorption on the solid particle surface affects the suspension properties. Frequently, there are changes in the electrokinetic properties of the system, i.e. changes in the adsorbent surface charge density and the zeta potential of the metal oxide particles.

On the basis of the performed adsorption measurements, it was found that human serum albumin adsorbs on the

surface of analyzed metal oxides (chromium(III) oxide, silica and zirconia) in the whole examined pH range (3, 4.6, 7.6, 9). Figure 1 shows the HSA adsorption level on the chromium(III) oxide surface.



Figure 1: Adsorption amount of human serum albumin on chromium(III) oxide at various pH

HSA adsorption amount on the analyzed metal oxide surface depends on the solution pH value. Regardless of the mineral oxide type, most albumin macromolecules adsorbed on the solid surface at pH value near the HSA isoelectric point. This is due to a packed protein conformation, which allows the adsorption of maximum amount of biopolymer macromolecules. Moving away from the pI value contributes to the gradual reduction of the adsorption level. The above dependency is associated with more developed protein structure. The adsorption of the macromolecules of expanded conformation blocks some active sites on the solid surface and thus the adsorption amount decreases. It should be also noted that lower adsorption amount in solutions of pH value significantly different from the pI point can also be the result of electrostatic adsorbent-adsorbate repulsion.

Electrokinetic potential measurements showed that the pH_{iep} (isoelectric point) values of analyzed adsorbents are various, i.e. pH_{iep} of chromium(III) oxide is 6, of silica is 3.2 and of zirconia is 10. This means that in solutions of pH value equal to the pH_{iep} point, the slipping plane of the solid particles has a zero net charge. Under these conditions, the concentrations of positive and negative groups in the slipping plane are identical. At pH below the pH_{iep} point positive moieties dominate, whereas at pH above this value negative groups are more numerous. The results of electrokinetic potential measurements are presented in the Figures 2-4 and summarized in Table 2.



Figure 2: Electrokinetic potential of chromium(III) oxide particles in the absence and presence of human serum albumin



Figure 3: Electrokinetic potential of chromium(III) oxide particles in the absence and presence of human serum albumin.



Figure 4: Electrokinetic potential of zirconia particles in the absence and presence of human serum albumin.

Human serum albumin adsorption changes the electrokinetic potential of the adsorbent particles. In the albumin presence the pH_{iep} of the adsorbent shifts to the value close to the HSA pI point. In the case of the chromium(III) oxide suspension the pH_{iep} of solid particles is identical to the albumin pI value. On the other hand, the silica and zirconia particles in the HSA presence are characterized by the pH_{iep} value close to 6 (see Table 2).

absence and presence of HSA

Mana	Isoelectric	point (pI)
Iname	Without HSA	With HSA
Cr_2O_3	6	5
SiO ₂	3.2	6.3
ZrO ₂	10	6.2

Table 2 Isoelectric point values of the adsorbents in the

The observed dependences suggest that the HSA concentration of 100 ppm is sufficient to cover the entire surface of chromium(III) oxide particles. It is evidenced by the pH_{iep} value of Cr_2O_3 particles in the albumin presence, which is equal to the HSA isoelectric point. Human serum albumin adsorbs on Cr_2O_3 , occupies the entire adsorbent surface and thereby give its surface the properties which are typical for HSA. Lack of identity between the solid pH_{iep} and the albumin pI in the case of silica and zirconia means that their surfaces are not completely covered with HSA macromolecules with a given concentration. The described phenomenon has been also observed by Rezwan [14-15] and Hindber [16].

5. Abbreviations and acronyms

HSA – human serum albumin, Cr_2O_3 – chromium(III) oxide, SiO_2 – silica, ZrO_2 – zirconia, S_{BET} – specific surface area, D_p – average pore diameter, ζ – electrokinetic (zeta) potential.

6. Conclusions

The results of the experimental works, i.e. electrokinetic potential and adsorption amount measurements, allowed to draw the following conclusions: (1) human serum albumin adsorbed on the metal oxide $(Cr_2O_3, SiO_2 \text{ and } ZrO_2)$ surface throughout the whole examined pH range, (2) adsorbed albumin gives the adsorbent surface the properties which are typical of HSA, (3) 100 ppm concentration of HSA is sufficient to cover the entire surface of the chromium(III) oxide particles, but (4) it is too low to cover the silica and zirconia particles.

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References

[1] Silva-Bermudez P, Rodil SE, Surface & Coatings Technology, Vol. 233, pp. 147-158, 2013

[2] Sul YT, Kang BS, Johansson C, Um HS, Park CJ, Albrektsson T, *Journal of Biomedical Materials Research A*, Vol. 89A, pp. 942-950, 2009

[3] Sul YT, Johansson CB, Jeong Y, Roser K, Wannerberg A, Albrektsson T, *Journal of Materials Science: Materials in Medicine*, Vol. 12, pp. 1025-1031, 2001

[4] Metikos-Hukovic M, Kwokal A, Piljac J, *Biomaterials*, Vol. 24, pp. 3765-3775, 2003

[5] Ostolska I, Wiśniewska M, *Colloid and Polymer Science* (in Press), 2014

[6] Wiśniewska M, Szewczuk-Karpisz K, *Environental Sciences and Pollution Research*, Vol. 20, pp. 3657-3669, 2013

[7] Szewczuk-Karpisz K, Wiśniewska M, Soft Materials, Vol. 12, No. 3, pp. 268-276, 2014

[8] Szewczuk-Karpisz K, Wiśniewska M, Pac M, Choma A, Komaniecka I, *Water Air and Soil Pollution* 225:2025, 2014

[9] Barnhart J, *Regulatory Toxicology and Pharmacology*, Vol. 26, pp. 3-7, 1997

[10] Gurav JL, Jung I, Park H, Kang ES, Nadargi DY. *Jounral of Nanomaterials*, 2010, doi:10.1155/2010/409310

[11] Lasek K, Okoński P, Mierzwińska-Nastalska E, *Prosthetic Dentistry*, Vol 6, pp. 415-422, 2009

[12] Patkowski J, Janusz W, Journal of Colloid and Interface Science, Vol. 266, pp. 259-268, 2003

[13] Putnam FW, *The Plasma Proteins: Structure*, *Function and Genetic Control*, 2nd ed., Academic Press, New York 1975.

[14] Rezwan K, Meier LP, Rezwan M, Voros J, Textor M, Gaucler LJ, *Langmuir*, Vol. 20, pp. 10055-10061, 2004

[15] Rezwan K, Meier LP, Geuckler LJ, *Biomaterials*, Vol. 26, pp. 4351-4357, 2005

[16] Hindber PC, Graule TJ, Gauckler LJ, *Journal of the American Ceramics Society*, Vol. 79, pp. 1857-1867, 1996

THE ELECTROKINETIC PROPERTIES OF THE SYSTEM CONTAINING POLYLYSINE-BLOCK-POLYETHYLENE GLYCOL COPOLYMER AND COLLOIDAL SILICA (SiO₂)

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Abstract: The studies involve adsorption and electrokinetic behaviour of the system consisted of the ionic block copolymer and colloidal silica. In order to precisely determine the polymer binding mechanism, all measurements were performed as a function of solution pH value. Adsorbed amount $(\Gamma, mg/m^2)$ of the applied polyamino acid block copolymer was measured by the spectrophotometric method. Moreover, the electrokinetic properties of the silica were explained on the basis of the obtained surface charge density and zeta potential dependencies (in the absence and presence of the analyzed macromolecular compound).

Keywords: copolymer adsorption, potentiometric titration, zeta potential, polylysine-polyethylene glycol copolymer, colloidal silica

1. Introduction

The presence of the macromolecular compounds has a significant influence on the colloidal systems properties. The adsorption of polymers (natural or synthetic) at the solid – liquid interface is a very sophisticated process determined by many factors such as macromolecule structure, solution pH, temperature and surface properties of the adsorbent [1-4].

 SiO_2 was applied as an adsorbent in the presented studies. Due to its properties such as high mechanic hardness, low sensitivity to the temperature changes as well as marked specific surface area, this mineral oxide is commonly used in many branches of industry. Additionally, silica is stable in broad pH range. Owing to mentioned properties, SiO_2 is one of the most popular adsorbent in the adsorption processes [5,6].

The electrokinetic properties of the colloidal silica were examined in the absence and presence of the block copolymer (LYS-PEG). This macromolecular compound consists of two parts of differ ionic nature. One of them is polylysine (LYS), the cationic polyamino acid, which provides a complete biodegradability of the polymer. The second one – the nonionic polyethylene glycol (PEG) block is characterized by an excellent solubility in water and resistance to pH changes. Because of the different character of the mentioned fragments, in various solution pH conditions the copolymer macromolecules can form the adsorption layers exhibiting diversity of structures.

The aim of this paper was to determine the influence of the LYS-PEG adsorption at the solid-liquid interface on the silica interfacial properties.

2. Materials and Methods

Silicon dioxide (SiO_2) produced by POCh Gliwice (Poland) was used as an adsorbent. The specific surface area of SiO₂ determined by the BET method (analysis of nitrogen adsorption-desorption isotherms; Micromeritics ASAP 2405 analyzer) was found to be 261.7 m²/g. The solid was washed with doubly distilled water to remove

the impurities until the conductivity of the supernatant was smaller than 2 μ S/cm.

As a macromolecular compound the polylysine-blockpolyethylene glycol copolymer (LYS-PEG) was applied. Polymer average molecular weight was equal to 34,000 Da (33,000 Da for LYS block and 1,000 Da for PEG; see Fig.1). The dissociation constant value (pK_a) determined by the potentiometric titration for LYS segments was 10.55. All measurements were performed at room temperature ($\approx 25^{\circ}$ C). NaCl of concentration 0.01 mole/dm³ was used as a supporting electrolyte.

Adsorbed amount (Γ , mg/m²) of the block copolymer was measured by the spectrophotometric method with a UV-Vis Spectrophotometer Carry 100 (Varian) connected to the computer. Experiments were carried out for the three pH values: 4, 7.6 and 10. 0.01 g of SiO₂ was added to 10 ml of polymer solution in the supporting electrolyte with suitable concentration. Next pH was adjusted to the desired value using HCl and NaOH at a concentration of 0.1 mole/dm^3 . To achieve adsorption – desorption equilibrium, the suspension was shaken for 20 hours in a thermostated shaker (25°C). Then, the suspension was centrifuged twice for 5 minutes and 5 ml of clear solution was taken for further analysis. The absorbance of LYS-PEG was measured at a wavelength 210 nm. The extent of polymer adsorption was calculated from the calibration curves measured in solutions of different pH values. The measurement uncertainty in the analysis was up to 3 %. Surface charge density (σ_0) of SiO₂, determined by potentiometric titration, was calculated from the dependence between the volume of base added to the

$$\sigma_0 = \frac{\Delta V cF}{mS} \tag{1}$$

where: ΔV – the difference between volume of base added to the suspension to obtain the desired pH of the solution, c– the molar concentration of base, F – the Faraday

suspension in order to obtain desired pH value:

constant (9.648 ×10⁴ C/mole), m – the mass of the metal oxide, S – the specific surface area of applied metal oxide. SiO₂ surface charge density was measured in the presence

and absence of LYS-PEG (at the concentration of 10 or 100 ppm). 0.1 g of SiO₂ was added to a thermostated Teflon vessel containing 50 cm³ of supporting electrolyte solution or polymer solution with a fixed concentration. The initial pH value was equal to 3. The suspensions were titrated with the NaOH solution (0.1 mole/dm³). The measurements set consists of a thermostated Teflon vessel with a stirrer, an automatic burette (Dosimat 765, Methrom), glass and calomel electrodes (Beckman Instruments) and the pH meter PHM 240 (Radiometer). The process was controlled by a computer. The surface charge density was calculated using the "Titr_v3" program written by Władysław Janusz.

The zeta potential measurements were carried out in the absence and presence of the copolymer in the pH range of 3-10 (Zetasizer NanoZS90, Malvern Instruments). In this case, a suspension of 50 cm^3 containing 0.01g of SiO₂ in the supporting electrolyte solution was prepared. Next, the suspension was sonicated for 3 minutes (Ultrasonic Processor XL, Misonix) and the required pH value in the samples was adjusted by adding an appropriate amount of HCl or NaOH (at a concentration of 0.1 mole/dm³). In order to study polymer adsorption influence on the zeta potential of the silica colloidal particles, 0.01 g of the solid was added to the NaCl solution with a fixed polymer concentration (ranging from 0.1 to 10 ppm). The electrokinetic potential was measured with the zetameter connected with the computer. Each average value is the result of six repetitions. The measurement error did not exceed 5 %.



Figure 1: Structure of LYS-PEG block copolymer

3. Results and Discussion 3.1 Adsorption

Adsorbed amount received for the analyzed block copolymer (denoted as LYS-PEG) is shown in Fig. 2. As it can be seen, this process is strongly depended on the solution pH conditions. It is related to the considerable changes which both the polymer functional groups and silica surface charge undergo with the pH rise. At pH 4, the number of positively and negatively charged active groups existing on the silica surface is practically the same (SiO₂ point of zero charge is about 3-4). Under these conditions, the PEG block forms the hydrogen bridges with Si-OH₂⁺ as well as Si-OH surface species. Moreover, the ionized amino groups belonging to the polylysine part can also interact with the adsorbent surface electrostatically. A high LYS segments dissociation degree

(100% at pH 4) is responsible for the stretched conformation of the adsorbed copolymer macromolecules. It leads to the situation in which the remaining SiO₂ active centres become blocked by the almost straight LYS-PEG chains and as a result the polymer adsorption is low.

The data presented in Fig. 2 strongly prove that the LYS-PEG adsorption increases, as the solution pH rises. It follows from the different adsorption mechanism of the examined polymer. The more alkaline solution is, the greatest number of the negative charges on the particles surface appear. Simultaneously, the polylysine block dissociation degree decreases reaching 78% at pH 10 [3]. It favours the more coiled copolymer chains conformation and therefore the macromolecules require less space on the SiO₂ surface resulting in the distinct adsorption growth (especially at pH 10). Finally, the LYS-PEG bonding is mainly driven by the electrostatic interactions between the ionized amino groups originating from the polylysine block and the negatively charged adsorbent active centres. In addition, considering the influence of the pH changes on the block LYS-PEG copolymer adsorption it must be emphasized that at alkaline pH the hydrophobic interactions and the hydrogen bond formation also play an important role in the adsorption process. What is more, the PEG block, which practically loses the affinity for the mineral oxide surface, can interact with the adjacent LYS parts of macromolecules reducing the mutual repulsion between them.



Figure 2: Influence of the solution pH on LYS-PEG adsorption on the SiO₂ surface

3.2 Potentiometric Titration

The surface charge (σ_0) on the metal oxide is formed as a result of reactions between the surface hydroxyl groups (\equiv SOH) and electrolyte ions [7]. The most important factor in the surface charge formation process is the concentration of hydrogen and hydroxide ions as well as ions of background electrolyte. Hydrogen ions influence the surface charge density through the reactions of surface hydroxyl groups:

$$\equiv SOH_2^+ \leftrightarrow \equiv SOH + H^+ \tag{1}$$

$$\equiv SOH \iff \equiv SO^- + H^+ \tag{2}$$

Additionally, the ionic polymer nature also influences the mineral oxide surface charge density. Positively charged

amino groups can interact with silica surface causing the hydrogen ions dissociation from \equiv SOH groups (eq. 3). In a consequence, a certain number of \equiv SO⁻ is created and the total charge is reduced [8]. It should be noted that the nonionic PEG block presence does not change the σ_0 value.

$$\equiv SOH + NH_3^+ - R \rightarrow \equiv SO^- NH_3^+ - R + H^+ \qquad (3)$$

The analysis of data obtained from the potentiometric titration shown in Fig. 3 indicates that the LYS-PEG addition can increase or decrease the SiO₂ particles surface charge density depending on the copolymer concentration and the solution pH conditions. It is related to the polymer adsorption layer structure formed at the solid-liquid interface. For the system containing 10 ppm of the tested copolymer, there is a lack of the σ_0 values changes in the pH range 3.5-8 (curves received for the systems with and without polymer are overlapping). The reason for such a behaviour is the low LYS- PEG adsorption on the SiO₂ surface. Above pH 9, an essential increase in the block copolymer adsorption leads to the surface charge density growth compared to the results obtained for the silica in the supporting electrolyte. It is associated with the presence of the numerous positive charges in the adsorbent by-surface layer due to the strong electrostatic attraction between the LYS block and the SiO₂ particles.



Figure 3: Surface charge density of SiO₂ in the absence and presence of LYS-PEG block copolymer

As one can noticed, the increase in the LYS-PEG content considerably influences the electrokinetic properties of the investigated system. As in the case of system containing copolymer at the concentration of 10 ppm, in the pH range from 3.5 to 4.5 a low adsorption contributes to the lack of significant differences in the σ_0 values. Above pH 5 (up to pH 10) the LYS-PEG copolymer concentration growth leads to the solid particles surface charge reduction. It follows from the induction a higher number of the negative surface groups on account of the numerous ionized amino groups attendance, belonging to the LYS block located on the silica surface. At pH 10-11, the increase in σ_0 value is observed (with regard to the SiO₂). This phenomenon can be explained by the predominance of positive charges presence on the effect related to the negatively charged

surface groups induction. As it was mentioned before, the solution pH growth causing the changes in polymer conformation structure. At neutral pH conditions (e.g. 7.6) the stretched polymer chains adopt a flatter conformation resulting in the blockade of the adsorbent active sites. Above pH 10, the LYS segments dissociation degree decrease contributes to formation of more coiled structure of the adsorbed copolymer chains. As a consequence, the number of macromolecules linked to the SiO₂ surface increases.

3.3 Zeta Potential Measurements

In order to make a comprehensive electrokinetic analysis of the studied system, the SiO₂ particles zeta potential measurements were carried out in the absence and presence of the block copolymer (Fig. 4). It can be clearly seen that the mineral oxide ζ potential without LYS-PEG changes in the range from 1.4 mV to -38 mV. From the course of the silica zeta dependencies obtained in the presence of copolymer at the different concentrations, it was found that even small LYS-PEG attendance considerably affects the electrokinetic properties of the investigated systems.



Figure 4: The SiO₂ particles zeta potential in the absence and presence of LYS-PEG block copolymer

As one can noticed, in the presence of even small copolymer amount, the adsorbent zeta potential growth in the pH range from 5 to 8 units is observed compared to the values obtained for the system without LYS-PEG. It comes from the positively charged amino groups (belonging to the polylysine block) presence in the diffusion part of electrical double layer around solid particles. The curves for both systems: SiO_2 and $SiO_2/$ LYS-PEG (0.1 ppm) at the 3-4 pH values as well as above pH 9 are practically overlapping. At initial pH it is caused by a very low copolymer macromolecules adsorption. Reasons for such a behaviour in the second case may be found in the canceling of the contrary effects: the positive charge presence in the by-surface layer and the slipping plane shifting by the strongly adsorbed polymer chains. Similar situation takes place in the system at the concentration of 1 ppm of the LYS-PEG copolymer (also above pH 9). Increasing the block copolymer concentration results in a higher number of LYS-PEG macromolecules adsorbed on the silica surface. This leads to the situation in which the numerous positively charged - NH_3^+ groups are located in the diffuse part of the electrical double layer providing the considerable solid particles zeta potential growth, especially in the pH range 3 - 7. In more alkaline pH environment the LYS segments dissociation degree is reduced and the polymer macromolecules exhibiting more coiled conformation on the silica surface and form the densely packed adsorption layer rich in the loops and tails (in relation to pH 4). Hence, the adsorbent zeta potential decrease can be explained by a greater contribute of the shipping plane shift effect. In the system containing the highest LYS-PEG concentration (10 ppm), the electrokinetic potential of the SiO₂ particles covered LYS-PEG copolymer macromolecules by the electrokinetic potential reaches almost only positive values.

The comparison between the data collected from the different measurements allows to propose about the most probable adsorption mechanism of the LYS-PEG block copolymer on the silica particles, leading to the explanation of the studied system electrokinetic properties (schematically presented in Fig. 5).



*Figure 5: Scheme of the LYS-PEG block copolymer adsorption mechanism on the SiO*₂ *particles surface*

6. Conclusions

The influence of the concentration, as well as the solution pH on the adsorption and electrokinetic properties of the system SiO_2/LYS -PEG ionic copolymer was investigated. On the basis of above findings a few conclusions may be drawn. The performed measurements point out that the LYS-PEG block copolymer adsorption strongly depends on the solution pH value. The maximum is reached at pH 10, whereas the fewest polymer macromolecules were bound to the adsorbent surface in the acidic environment. It follows from the changes in the interactions between the components of the tested system resulting in the differences in the copolymer chains conformation.

The data obtained from the potentiometric titration prove that the LYS-PEG copolymer concentration strongly affects the adsorbent surface charge density. At lower concentration, the surface charge growth above pH 9, related to the positively charged amino groups presence in the by-surface layer, is observed. The situation in the system containing a higher copolymer concentration is a more complex. In this case, the negatively charged surface groups induction also plays the important role.

Adsorption of the analyzed copolymer strongly affects the SiO_2 particles zeta potential value mainly due to the presence of the positively charged amino groups in the diffusion layer and the shift of the slipping plane. The total contribution of these two effects is responsible for the experimentally observed electrokinetic potential values of the solid particles covered with the polylysine-block-polyethylene glycol copolymer macromolecules.

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References

[1] M. Wiśniewska, *Journal of Dispersion Science and Technology*, Vol. 32, pp. 1605-1623, 2011.

[2] S. Chibowski, J. Patkowski, E. Opala-Mazur, *Materials Chemistry and Physics*, Vol. 92, pp. 519-525, 2005.

[3] I. Ostolska, M. Wiśniewska, *Applied Surface Science*, Vol. 311, pp. 734-729, 2014.

[4] M. Wiśniewska, K. Szewczuk-Karpisz, I. Ostolska, *Fluid Phase Equilibria*, Vol. 360, pp. 10-15, 2013.

[5] S. Chibowski, J. Patkowski, E. Opala-Mazur, *Materials Chemistry and Physics*, Vol. 92, pp. 519-525, 2005.

[6] M. Kosmulski, *Surface Charging and Points of Zero Charge*, CRC Press, 2009, p. 20.

[7] W. Janusz, I. Kobal, A. Sworska, J. Szczypa, *Journal* of Colloid and Interface Science, Vol. 187, pp. 381 – 387, 1997.

[8] S. Chibowski, J. Patkowski, E. Grządka, *Journal of Colloid and Interface Science*, Vol. 329, pp. 1-10, 2009.

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THE ORDERS DIPTERA AND COLEOPTERA AND THEIR NECROPHAGOUS ROLE IN THE CADAVER DECOMPOSITION IN TWO REGIONS OF THE CZECH REPUBLIC

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Abstract: The research shows if the differences in the necrosaprophagous species diversity exist in two Moravian regions of similar elevation: Olomouc and South Moravia Region (locality A and B). In the study there were considered only the orders Diptera and Coleoptera. The dependence on weather conditions and season was included. Sampling of the insect was being conducted from July to September 2014 on pig cadavers. In the locality A 31 species were caught, 21 species in the locality B. In both localities 18 found species were identical. Families with the highest medico-legal importance were identified in the study: Calliphoridae, Sarcophagidae and Muscidae in Diptera species as well as in Coleoptera species: Dermestidae, Cleridae and Histeridae. In each order 7 families of insect were classified. The number and specimen diversity in both localities were monitored in season of high rainfall when colonization by necrophagous fauna is suppressed and decomposition changes because of sudden deluges of summer storms. Species representation and number of found specimens indicates no significant differences in the monitored localities.

Keywords: insect, locality, carcass, forensic entomology

1. Introduction

Successive colonization of a dead body by insect is a complex and difficult process. The body decomposition undergoes chemical and physical changes accompanied by animate and inanimate nature effects. A dead body is exposed to many factors which can reduce or extend length of decomposition. Climate conditions, season and necrophagous insect activity are the most important factors affecting decay stages. Knowledge about insect biology, propagation and behaviour provide more specific and accurate information during criminal investigation and could specify when, where and what circumstances happened on the place where the crime was committed.

Significant groups of insect observed on the decomposing cadavers are mainly the order Diptera, species related to families Calliphoridae, Muscidae and Sarcophagidae and the order Coleoptera with important families as Dermestidae, Cleridae and Silphidae. Diptera colonize the dead body at first and provide very accurate information for Post Mortem Interval (PMI) determination used in criminal investigation [1, 2]. The research in forensic entomology has done a big progress in last decade [3, 4]. The aim is to complete and precise identification of all the insect species participating in body tissue decomposition using morphological methods or nowadays preferred molecular identification methods (Barcode sequencing) [5]. DNA identification is useful when the very close related species are not possible to determine or it is more time consuming to bring juvenile stages to imago and do not get wrong results. Species in different ecosystems is also needed to identify because they can differ during the year or even within hours during a day [6]. Insect species (include other invertebrates) and their developmental stages should be relevant part of gathering evidence material in legal investigation [7].

The aim of this work was observation of necrophagous Diptera and Coleoptera species monitored in two geographically different localities with similar altitude.

2. Materials and methods

2.1 Localities

Chosen localities were far away from each other. The locality **A** was in a vicinity of Litovel-Brezove $(49^{\circ}41'20.9"N, 17^{\circ}07'33.2"E)$ in the Olomouc Region. The area is sited in the middle watercourse of the river Morava surrounded mainly by alluvial forest 210 MASL. Annual average temperature is 8.1 C, rainfall 716 mm and 1750 h of daylight. During July average air temperature was 21.5 °C, 253.2 h of daylight and rainfall in total was 91.9 mm.

The locality **B** is in a vicinity of village Zabcice $(48^{\circ}59'32.8"N, 16^{\circ}35'19.1"E)$ in the South Moravia Region about 25 km on the South from Brno. Land has mostly a flat character with an average altitude of 185 MASL. Annual average temperature is 9.4 C, rainfalls 601 mm and 1771 h of daylight. Zabcice are found in the maize agricultural production area mainly surrounded by fields and vineyards with a few small groves constituted mainly from locust trees. Climate condition evaluation data were used from near meteorological stations [8].

2.2 Experimental objects

Sampling was carried out during July, August and September. For the experiment were used corpses of piglets, parts of pork meat or slaughterhouse worked pig trunks placed under the wire box to avoid the presence of vertebrate predators. Samples were collected manually to marked tubes to avoid damage of results and placed into conservation medium (denatured alcohol). Flying insect (Diptera) were caught in entomological nets and deep frozen in a laboratory freezer, stored in the tubes with ethanol (70%) particularly labelled with the date and name of the locality [9].

2.3 Ecological indexes

Species diversity is assessed by ecological indexes which can more objectively characterise the species spectrum found in different localities. Calculation of Jaccard's index of similarity and Sørensen diversity index were conducted in the study [10].

3. Results and discussion 3.1. Identified species of Dints

3.1 Identified species of Diptera

In both localities 12 species of Diptera were collected (table 1) and 8 of them were identical for both localities.

Tab. 1 List of identified Diptera species in both localities

1	Litovel +	Lucilia sericata	(Meigen, 1826)
2	Zabcice	Lucilia caesar	(Linnaeus, 1758)
3		Calliphora vicina	(Robineau-Desvoidy, 1830)
4		Calliphora vomitoria	(Linnaeus, 1758)
5		Sarcophaga carnaria	(Linnaeus, 1758)
6		Piophila casei	(Linnaeus, 1758)
7		Stearibia nigriceps	(Meigen, 1826)
8		Sepsis fulgens	(Meigen, 1826)
9	Litovel	Protophormia terraenovae	(Robineau-Desvoidy, 1830)
10		Musca domestica	(Linnaeus, 1758)
11		Sphaerocera curvipes	(Latreille, 1805)
12		Drosophila funebris	(Fabricius, 1787)

Identified Diptera species belong to 7 families as follows: Calliphoridae, Sarcophagidae, Muscidae, Piophilidae, Sepsidae, Sphaeroceridae and Drosophilidae and are in conformity with cited literature [11-16], where three families (Calliphoridae, Sarcophagidae, Muscidae) are predominant in medico-legal importance and they are mostly on exposed body as first [17-19]. Calliphoridae includes psychrophilic species (*Calliphora vicina*) which lays eggs also in dark places up to the last days of October thus their occurrence during research on September is not an exception [20]. Thermophilic and heliophilic species (*Lucilia sericata, Lucilia caesar*) occur mainly during summer months and lay their eggs on the early stage of dead body from June to the middle of September [20, 21].

The only species found from family Sarcophagidae was *Sarcophaga carnaria* which occurs on the early stage of body decomposition and adapts very good to the environment [20]. Three species from family Muscidae colonize cadaver after Calliphoridae and Sarcophagidae species which was proved in our experiment too [20, 22]. On the pig corpses other species such as *Piophila casei* and *Stearibia nigriceps* from family Piophilidae were observed. Two mentioned species are usually present on the cadaver in later stages of decomposition [18]. Species as *Sepsis fulgens* (Sepsidae), *Sphaerocera curvipes* (Sphaeroceridae) and *Drosophila funebris* (Drosophilidae) have the supporting role for forensic entomology. They are usually attracted by the decaying material and excrements [20, 23].

3.2 Identified species of Coleoptera

In total 22 species of the order Coleoptera were identified (table 2) in localities \mathbf{A} and \mathbf{B} where 10 of them were identical for both localities.

Tab. 2 List of identified Coleoptera species in both	ı
localities	5

1	Litovel +	Necrobia rufipes	(De Geer, 1775)
2	Zabcice	Saprinus semistriatus	(L.G. Scriba, 1790)
3		Hister unicolor	(Linnaeus, 1758)
4		Gauropterus fulgidus	(Fabricius, 1787)
5		Philonthus politus	(Linnaeus, 1758)
6		Dermestes murinus	(Linnaeus, 1758)
7		Dermestes frischi	(Kugelann, 1792)
8		Nicrophorus vespilloides	(Herbst, 1784)
9		Necrodes littoralis	(Linnaeus, 1758)
10		Thanatophilus rugosus	(Linnaeus, 1758)
11	Litovel	Thanatophilus sinuatus	(Fabricius, 1775)
12		Oiceoptoma thoracicum	(Linnaeus, 1758)
13		Nicrophorus interruptus	(Stephens, 1830)
14		Nicrophorus vespillo	(Linnaeus, 1758)
15		Dermestes lardarius	(Linnaeus, 1758)
16		Dermestes haemorrhoidalis	(Küster, 1852)
17		Anoplotrupes stercorosus	(Hartmann in L.G. Scriba, 1791)
18		Nitidula bipunctata	(Linnaeus, 1758)
19		Necrobia violacea	(Linnaeus, 1758)
20	Zabcice	Ocypus macrocephalus	(Gravenhorst, 1802)
21		Creophilus maxillosus	(Linnaeus, 1758)
22		Ontholestes tessellatus	(Geoffroy, 1785)

Coleoptera species belonging to 7 families were reported: Dermestidae, Cleridae, Silphidae, Staphylinidae, Histeridae, Geotrupidae and Nitidulidae. The richest families are considered Dermestidae, Cleridae and Histeridae. Highest predator role has the family Staphylinidae where both feeding stages are predacious and feed on maggots and other larvae present on carcasses [24]. The species with the highest potential for forensic entomology is *C. maxillosus* [25].

The most promising as indicators of PMI are *Necrodes* and *Thanatophilus* species [25, 26]. *Necrobia littoralis, Thanatophilus sinuatus* and *Thanatophilus rugosus* regularly and abundantly visit and breed in pig carcasses [25]. A few taxa from family Cleridae and Dermestidae are recognised as useful for forensic purposes as *Necrobia* and *Dermestes* species [27]. *Necrobia rufipes, N. violacea,* and *Dermestes frischii* regularly and abundantly visit and breed in pig carcasses [28].

Adventitious and omnivorous species such as wasps, ants, springtails and spiders use the corpse as an extension of their environment and were not included to the study. According to the literature results show *N. littoralis*, *N. rufipes*, *C. maxillosus*, *P. politus* and *Saprinus semistriatus* are highly useful for estimation of PMI. All these species are probably regularly breed in carcasses; they are abundant and easy to collect. The research group of Matuszewski were studying also the estimation of pre-appearance

interval (PAI) and concluded that there are firm premises for estimating PAI from temperature in these species [28].

3.3 Indices of similarity

Faunistic similarity indices are used to obtain more objective information about the conformity or nonconformity of two and more compared biocoenosis. The Jaccard's index of similarity and Sørensen diversity index were applied (table 3).

Tab. 3 Number of species in both localities

	Diptera	Coleoptera	D + C
Litovel	12	19	31
Zabcice	8	13	21
Conformity	8	10	18
Species in total	12	22	-

Jaccard's index in Diptera species is 66.7 %, Coleoptera species 45.5 % and whole coenosis of necrophagous species together is 52.9 %.

Sørensen index in Diptera species is 80.0 %, Coleoptera species 62.5 % and whole coenosis of necrophagous species together is 69.2 %.

Species similarity of the localities **A** and **B** was 69.2 %. In the locality **A** 31 species were monitored, in the locality **B** 21 species were monitored where 18 species were identical.

3.4 Influence of climatic conditions

In the locality **A** first colonization of the pig corpse was observed immediately when the experiment started in July 2014. Colonisation was highly suppressed during storms occurred a few times mainly in case of Diptera imago species which prefer sunny and dry weather.

The first colonization was observed in the second locality in the beginning of experiment as well. The colonization was also limited due to the rainfall activity. The high rainfall activity indicates lower occurrence of necrophagous fauna. Vice versa higher day average temperature and larger amount of sunny days during a month increase occurrence of necrophagous species. Localities **A** and **B** belong to a lowland zone (up to 300 meters above sea level=MASL) [23]. In this study the altitude didn't show obvious diferrences in between observed localities.

4. Conclusions

Insect colonization of pig cadaver was observed in two localities in the Czech Republic with similar elevation but different climate conditions. Sampling was carried out during July, August and September 2014. Necrophagous species were collected manually and stored in denatured alcohol prepared to further identification or preparation for entomological collections. The air temperature, humidity, number of sunny days and rainfalls were observed.

Diptera species in 7 families were identified: Calliphoridae, Sarcophagidae, Muscidae, Piophilidae, Sepsidae, Sphaeroceridae and Drosophilidae. Coleoptera species were classified into 7 families as follows: Dermestidae, Cleridae, Silphidae, Staphylinidae, Histeridae, Geotrupidae, Nitidulidae.

Colonization of necrophagous fauna is decreasing and dead body decay is changing because of high rainfalls. Rainfalls influence mainly presence of Diptera species. Their quantity is suppressed which is essential in the first days of colonization. On the other hand higher number of sunny days and higher air temperature make the decomposition by the insect faster and flesh matter is rapidly consumed by larvae. Localities were both in lowland zone which probably led to the similar species diversity. Next observations of various localities (residential areas, forests, meadows, etc.) are needed to carry out to gain more objective results. Next evaluations in different conditions and in a different elevation could significantly vary.

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References

[1] Sulakova H., Specialni biologie: vyuziti hmyzu pri stanoveni post mortem intervalu, *Kriminalisticky sbornik*, pp. 36-37, 2006

[2] Gennard D., *Forensic Entomology*, Chichester, England, Wiley & Sons, 2007, 224 p.

[3] Benecke M., A Brief History of Forensic Entomology, *Forensic science international*, 120, pp. 2-14, 2001

[4] Amendt J., Campobasso C. P., Goff M. L., Grassberger M., *Current Concepts in Forensic Entomology*, Springer, Dordrecht, Heidelberg, London, New York, 2010, 376 p.

[5] Nelson L. A., Lambkin C. L., Batterham P., Wallman J. F., Dowton M., Whiting M. F., Yeates D. K., Cameron S. L., Beyond barcoding: A mitochondrial genomics approach to molecular phylogenetics and diagnostics of blowflies (Diptera: Calliphoridae), *Gene*, 511, 2, pp. 131-142, 2012

[6] Benecke M., (eds.). Forensic Entomology Special Issue, Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology, 5, pp. 1-59, 2004

[7] Amendt J., Richards C. S., Campobasso C. P., Zehner R., Hall M. J., Forensic entomology: applications and limitations, *Forensic Sci Med Pathol.*, 7, 4, pp. 379-92, 2011

[8] CHMU–Czech Hydrometorological Institute, online [cit. 2014-17-10], 2014, url: http://portal.chmi.cz/

[9] Hall M. J. R., Turner B. D., *Forensic Enotomology -An Introduction and Summary of Collecting Techniques*, Natural History Museum, online [cit. 2011-10-18], 2011, url: http://www.nhm.ac.uk/

[10] Lastuvka Z., Krejcova P., *Ekologie*, 1st ed. Brno, Konvoj, 2000, 184 p.

[11] Byrd J. H., Castner J. L., *Forensic Entomology: The Utility of Arthropods in Legal Investigations*, Boca Raton, CRC Press, 2001, 418 p.

[12] Laupy M. Post mortem interval a nekrofilni mouchy. *Kriminalistika*, 2, pp. 121-135, 1994

- [13] Povolny D., Hmyz v kriminologii, Vesmir, pp. 205-208, 1978
- [14] Povolny D., Nektera hlediska praktickeho vyuziti hmyzu v kriminalistice, *Kriminalisticky sbornik*, pp. 620-632, 1979

[15] Hall M. J. R., *On Maggots and Murders - Forensic Entomology*, Natural History Museum, online [cit. 2012-04-08], 2000, url: http://www.nhm.ac.uk/

[16] Oosterbroek P., *The european families of the diptera*. *Identification, diagnosis, biology*, Utrecht, KNNV Publishing, 2006, 205 p.

[17] Amendt J., Krettek R., Zehner R., Forensic entomology, *Naturwissenschaften*, 91, 2, pp 51-65, 2004

[18] Gunn A., *Essential Forensic Biology*, Chichester, England, Wiley & Sons, 2009, 436 p.

[19] Joseph I., Mathew D. G., Sathyan P., Vargheese G.,

The use of insects in forensic investigations: An overview on the scope of forensic entomology, *J Forensic Dent Sci.*, 3 (2), pp. 89-91, 2011

[20] Byrd J. H., Castner J. L., *Forensic Entomology: The Utility of Arthropods in Legal Investigations*, 2nd ed. Boca Raton, CRC Press, 2010, 681 p.

[21] Povolny D., Nekolik uvah o osudech mrtvol obratlovcu v prirode, *Ziva*, p. 24-28, 1982

[22] Kelly J., Van Der Linde T., Anderson G., The Influence of Clothing and Wrapping on Carcass Decomposition and Arthropod Succession During the Warmer Seasons in Central South Africa, *Journal of forensic sciences*, 54 (5), pp. 1105-1112, 2009

[23] Danek L., Moznost vyuziti entomologie v kriminalistice, Praha, Kriminalisticky ustav, 1990, 142 p.
[24] Byrd J. H., Castner J. L., Insects of forensic importance, in: Byrd J. H., Castner J. L., (Eds.), Forensic Entomology. The Utility of Arthropods in Legal Investigations, CRC Press, Boca Raton, pp. 39-126, 2009

[25] Matuszewski S., Bajerlein D., Konwerski S., Szpila K., Insect succession and carrion decomposition in selected forests of Central Europe. Part 2: composition and residency patterns of carrion fauna, *Forensic Sci. Int.* 195, pp. 42-51, 2010

[26] Midgley J. M., Villet M. H., Development of Thanatophilus micans (Fabricius 1794) (Coleoptera: Silphidae) at constant temperatures, *Int. J. Legal Med.*, 123, pp. 285-292, 2008

[27] Midgley J. M., Richards C. S., Villet M. H., *The utility of Coleoptera in forensic investigations*, in: J. Amendt, C.P. Campobasso, M.L. Goff, M. Grassberger (Eds.), *Current Concepts in Forensic Entomology*, Springer, Dordrecht, pp. 57-68, 2010

[28] Matuszewski S., Szafałowicz M., Temperaturedependent appearance of forensically useful beetles on carcasses, *Forensic science international*, 229 (1), pp. 92-99, 2013

FEASIBILITY OF USING A SALT TRACER DILUTION METHOD TO ESTIMATE STREAM FLOW IN SMALL MOUNTAINOUS CATCHMENTS IN THE SUMAVA MOUNTAINS

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Abstract: Streamflow monitoring is very important in hydrological studies, especially, determining the relationship between the water stage, which is captured by a monitoring station, and discharge is still a challenge. Therefore, selecting the method to measure the discharge is vital for analyzing the above-mentioned relationship, i.e. rating curves. In small mountainous streams, an effective and equivalently-accurate alternative to the conventional velocity-area method for developing rating curves involves the injection of a chemical tracer. Salt dilution uses the changes in concentration caused by salt injection to estimate the streamflow. Due to the electrical conductivity of the solution, it is more feasible and easier to measure in the field than stream concentration itself. These two factors are linearly related, and recording the change of electrical conductivity offers a possibility to track streamflow. This pilot study attempts to compare the velocity-area method as a benchmark with a tracer method: salt dilution in four mountainous streams in the Sumava Mountains, where problems with discharge measurement are often confronted. This paper provides a theoretical background of these two methods and a detailed experimental setting for application. The results of the comparison show a great potential for the salt dilution method as an alternative to measure discharge when the conventional method is not suitable. Overall, this study provides a basis for future work concerning establishment of a rating curve, constructing a constant injection station, and evaluating the uncertainties from both methods under different flow regimes.

Keywords: streamflow, salt dilution, electricity conductivity, discharge

1. Introduction

Streamflow is one of the most important variables in the hydrological cycle, and it is still a challenge to continuously measure it directly in an inexpensive and simple way [1] [2]. Therefore, the streamflow (i.e. discharge, Q) is converted from the measured water stage (h) at a cross-section by an empirical stage-discharge relation, known as the rating curve [2] [3]. Once the rating curve has been established, Q can be derived from records of the water stage at the gauging station [3].

One of the challenges in current hydrology research is how to establish rating curves over the entire range of stages for different types of stream channels [4]. Practically, in small mountain streams, the conventional velocity-area method [5] (e.g. using current meter) may be violated by turbulent flow regime, irregular bed geometry, and other factors, introducing significant uncertainties [6] [7]. Additionally, small streams, especially during low-flow conditions, are inconvenient to conduct measurement [8]. In such streams, an effective and equivalently-accurate alternative for developing a rating curve involves artificially injecting a chemical tracer (e.g. salt) [9] [10] [11] [12].

The objective of the study is to conduct a pilot study in testing the feasibility of salt dilution (i.e. a mass-balance method) for estimating streamflow in four mountainous catchments of the Sumava Mountains. The results of Q derived from a velocity-area method as a benchmark with a salt dilution method will be compared to discuss the potentials, limitations and future work of this alternative method.

2. Study site

The hydro-metrological monitoring network of our research area in the Sumava Mountains consists of 10 small catchments, occupying 2-5 km², each with different physiographic conditions. Each catchment's stream outlet is equipped an automatic ultrasonic water stage gauge (device M4016-G by Fiedler-Magr [14]), which captures water stage at 10-minute interval, transmits the recorded data to a data center with on-line access [14].



Figure 1: Four experimental catchment streams: CIK, CER, BRE, PTA.

Four representative streams (Fig.1) were selected for this study. Specifically, these four stream channels, which are in a natural status with multiple factors: relatively high turbulent flow, considerable gradients of stream slope, large variability of water stages (especially at a low level), and experience ice blockages in winters. These factors increase the difficulties in gaining various streamflow regimes of discharge measurements. Therefore, there are uncertainties on the establishment of rating curves.

3. Methodology and experiments3.1 Conceptual basis and theoretical background

Conventional velocity-area method: Q is calculated from the sum of *n* measurements of mean velocity $(\overline{V_n})$ and area (A_n) at different vertical locations along one stream crosssection (Eq.1, Fig.2) [5].

$$Q = \overline{V}_1 A_1 + \overline{V}_2 A_2 + \dots + \overline{V}_n A_n \tag{1}$$



Figure 2: Conceptual model of the velocity-area method.

Salt dilution - mass balance method: Q is estimated from the observed changes in the concentration of injected salt in stream water at the downstream measurement point, where the mass is fully mixed with the streamflow (Eq.2, Fig.3) [11] [13].

$$Q = \frac{M}{\sum C_M \times \Delta t} \tag{2}$$

Where M [mg] is the quantity of salt injected into the stream at the injection point. Then, at the measurement point at every Δt time interval, the concentration of injected salt, C_M changes. There are four stages of lateral mixing and longitudinal dispersion of the salt cloud, which explains the importance of the length of time for allowing the clod to completely disperse in the stream and also determine the measurement points [7] [13] [15] (Fig.3). The optimal mixing length is the ideal distance from the injection point to the downstream measurement point, which ensures an optimal and even degree of salt dilution in the stream throughout the cross-section of the watercourse [7] [13].



Figure 3: Simplified conceptual model of the salt dilution method.

The salt concentration is often represented by the measurements of the electrical conductivity (EC) in the stream based on a calibrated relationship between C_M and EC_M [6] (Elder et al., 1990):

$$C_M(t) = (EC_M(t) - EC_B) \times k \tag{3}$$

where EC_B [uS/cm] is the natural in-stream EC, $EC_M(t)$ [uS/cm] is the EC at time *t* corresponding to the salt solution concentration $C_M(t)$ in the stream, and *k* [(mg/l)/(uS/cm)], is a proportionality factor, indicating a near-linear relation between EC and salt concentration [13]. Therefore, the practical equation for calculating Q can be expressed as:

$$Q = \frac{M}{k \times \triangle t \times (\sum (EC_M(t) - EC_B))}$$
(4)

3.2 Methodological procedures of on-site experiments - There were five field campaigns conducted in four selected streams respectively in 7/2013, 8/2013, 9/2013, 10/2013, and 11/2013. Each campaign applied both the velocity-area method and salt dilution method in the same streamflow condition, which ensured the comparison of the estimated Q. The water stage records were collected from the data loggers at each station and were compared with on-site measurements.

The velocity-area method is achieved by using the FlowTracker and mean section discharge equation [17].

The salt dilution method consists of three main procedures:

(1) k-factor calibration

This procedure is to determine the k (in Eq. 3) by altering the concentration of the stream water to examine the responses of EC. Concentration increments in the sampled stream water from each studied stream are achieved by adding same amount of the prepared salt solution several times, then recording the EC values corresponding to the changes in concentration of the stream water after each injection. A detailed parameter setting is listed in Table 1. In order to reduce errors, this procedure was conducted in a laboratory environment. EC is measured by using a conductivity meter produced by YSI [17].

Additionally, the sterility of the equipment involved in the experiment during each step affects the accuracy of calibration, and therefore requires deep cleaning to avoid contamination from site to site [8] [13].

(2) Setting-up the experiment on-site

The experiment was conducted only on the weather without rainfall, which ensures the background EC is stable with the influence of the storm water [15].

The salt injection into the streamflow ranging from 0-2 m³/s should ensure an accuracy of $\pm 1\%$ /kgaccording to the weighing criteria listed in [13]. Therefore, preweighing the injected salt in a laboratory scale with 2 digits of precision (i.e. ± 0.01 g) and keeping the salt sample in a separated zip-lock freezer bags is required to reduce error in this step [13]. The amount of salt injection and its resulting concentration change varies due to the diversity of channel morphologies and discharges encountered in different streams in other studies [6] [9] [10] [11] [13]. Table 1 shows the injection dose used in this study under different streamflow condition.

Studies have proven that there is no systematic difference between the salt waves or calculated discharges in using dry salt or using a solution [6] [8]. Thus, the salt was predissolved in a bucket in all the experiments to ensure that the salt was fully dissolved in the water, even if the streams had low flow or limited turbulence.

Since the rate of lateral mixing and longitudinal dispersion of the salt cloud depends on several local factors, each site should have a characteristic optimum mixing length [13]. Methods of determining the optimal mixing length have been widely studied and developed [6] [8] [11] [12] [13], and the empirical equations that are needed to formulize are based on many on-site experiments with different mixing lengths under both low flow and high flow conditions at each particular site. This study considered six different mixing lengths in each experiment to determine the optimal mixing length, L_{opt} . Practically, the mixing length, L, was attempted starting from 25 times the mean stream width, \overline{W} , up to 75 times the \overline{W} [11] [12].

(3) Measuring EC and calculating Q

The conductivity probe is placed within the main line of the flow and not in an eddy or other backflow condition, where the fastest velocity is expected. The probe needs to be firmly placed, immobile, and continuously in the water during measurement [8].

Once the injection has been performed, the EC meter begins recording from the baseline EC until the cloud reaches the probe, along with the length of time, and recording ends when the EC returns to its baseline. The EC meter can record the timeline in various defined time intervals according to the needs of the experiment [6] [15]. Table 1 shows the time interval was chosen for the experiments in this study. Such measurements are repeated to ensure quality of measurements and also benefit the estimation of errors for future analysis.

Table 1 Description of the three main steps for the salt dilution method in terms of their detailed parameter settings.

Step	Parameters and units	Value	Condition
(1)	Concentration of salt solution [g/l] Stream water amount [l] Injected dose [ml] Injected times [-]	3 0.5 1 10	- - -
(2)	Injection dose [kg]	1 2 3	Q<0.1m ³ /s 0.1 <q<1m<sup>3 /s Q>1m³/s</q<1m<sup>
(3)	Recording time interval [s]	5	-

4. Results & Discussion

4.1 k-factor calibration

Fig.4a shows a near-linear relation between EC and salt concentration by using the stream water from each studied site in experiment No. 2 performed in a laboratory. Other experiments in both laboratory and on-site measurements illustrate the same relation. Fig.4b summarizes the mean and standard deviation of the k-factor in four studied streams based on five experiments, calibrated in both laboratory and on-site measurements. Calibrations in laboratory show smaller variations than in the field in all the experiments.

Overall, k is around $0.5\pm5\%$ [(mg/l) (uS/cm)] in all the streams. In the case of flooding or special circumstances, k can be determined as 0.5 when calibration is unable to be performed, ensuring the same equipment and the same quantity of salt are used as before.



Figure 4: a) Calibrating k for each studied stream in experiment No.2 in a laboratory environment; b) Mean and standard deviation of k in each studied stream from five experiments in laboratory and on-site.

4.2 Mixing length calibration

The passage of the salt cloud causes EC to increase from its baseline value to a peak value, corresponding to the passage of the core of the cloud (i.e. high salt concentration), followed by a decline to the baseline. At different mixing lengths, the dispersion patterns of EC over time act differently, as shown in Fig.5a, an example of salt wave in PTA with six different patterns. The longer the mixing length, the flatter the salt wave.



Figure 5: Results of the salt dilution method used for PTA in experiment No.2. a) Salt wave recorded by the EC meter with different mixing lengths; b) calculated Q based on the EC measurements from each mixing length, together with the FlowTracker measured Q with \pm 6% of uncertainty used as a benchmark for comparison.

Six salt waves resulting from different mixing lengths in Fig.5a are converted to discharge Q, and Fig.5b shows the $55 \times \overline{W}$ is the optimal mixing length for a low flow situation (Q<0.1m³/s) in PTA stream.

Table 2 summarizes the mixing length calibration gained in five experiments under two different flow regimes, and the optimal mixing length for each stream requires more experiments to optimize it.
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Table 2 Summary of the optimal mixing length in four studied streams based on five experiments: 3 experiments with relatively low flow ($Q < 0.1m^3/s$), and 2 experiments with relatively high flow ($Q > 0.1m^3/s$).

L _{opt} [m] 'situation	PTA	BRE	CIK	CER
Flow (Q<0.1m ³ /s)	$45 \times \overline{W}$	$45 \times \overline{W}$	$30 \times \overline{W}$	$35 \times \overline{W}$
Flow (Q>0.1 m ³ /s)	$65 \times \overline{W}$	$45 \times \overline{W}$	$50 \times \overline{W}$	$35 \times \overline{W}$

4.3 Comparison of Q derived from two methods

By comparing Q estimated from both methods in Fig.6, in low flow conditions (when Q<0.1m³/s), the differences are minor. When the flow is over than $0.1\text{m}^3/\text{s}$, the differences begin to be significant. However, according to the uncertainty of the FlowTracker, the discharge values with larger uncertainties may bring errors in comparison. The salt dilution method provides a great potential to improve the discharge measurement in both an extremely low water stage, when the FlowTracker is not usable, and during high streamflow, when the conventional method also introduces large errors.



Figure 6: In five experiments in each stream, the discharges measured by the velocity-area method (Qa) and the discharge estimated by the salt dilution with their optimal mixing lengths (Qb) are comparisons, and Qa show their measurement uncertainties with error bars.

5. Conclusion

The comparison of these two discharge measurement methods shows a great potential of the salt dilution methods as an alternative measurement for mountainous streams with turbulent flow and irregular bed geometry. This paper examines the salt tracer discharge measurement in the streams of Sumava Mountain is feasible, and defines the salt dilution method as a complementary when other methods are not suitable in the specific flow conditions, but not a replacement. Moreover, this pilot study provides a basis for the future work on the rating curve establishment, installation of constant injection station for floods, and analysis of uncertainties in measurements.

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References

[1] Nathanson, M., Kean, J. W., Grabs, T. J., Seibert, J., Laudon, H. and Lyon, S. W., Modelling rating curves using remotely sensed LiDAR data, *Hydrological Processes*, Vol. 26, pp. 1427-1434, 2012

[2] Weijs, S. V., R. Mutzner, and M. B. Parlange, Could electrical conductivity replace water level in rating curves for alpine streams?, *Water Resource Research*, Vol. 49 No.1, pp. 343-351, 2013

[3] Herschy, R., The stage-discharge relation, *Flow Measurement and Instrumentation*, Vol. 4, No. 1, pp. 11-16, 1993

[4] Westerberg, I. K., J.-L. Guerrero, P. M. Younger, K. J. Beven, J. Seibert, S. Halldin, J. E. Freer, and C.Y. Xu, Calibration of hydrological models using flow-duration curves, *Hydrology and Earth System Science*, Vol. 15, pp. 2205-2227, 2011

[5] Herschy, R., The velocity-area method, *Flow Measurement and Instrumentation*, Vol. 4, No. 1, pp. 7-10, 1993

[6] Elder, K., R. Kattelmann, and R. Ferguson, Refinements in dilution gauging for mountain streams, *International Association for Hydrological Science*, 193, Lausanne, IAHS Publication, 1990, 247–254.

[7] Benischke, R. and T. Harum, Determination of discharge rates in turbulent streams by salt tracer dilution applying a microcomputer system, Comparison with current meter measurements, *International Association of Hydrological Sciences Publication*, 193, Lausanne, IAHS Publication, 1990, 215-221.

[8] Moore, R.D., Introduction to salt dilution gauging for streamflow measurement: Part 1, *Streamline watershed Management Bulletin*, Vol.7, No.4, pp. 20-23, 2004

[9] Østrem, G., A method of measuring water discharge in turbulent streams, *Geographical Bulletin*, Vol. 21, pp. 21-43, 1964

[10] Church, M. and R. Kellerhals., Stream gauging techniques for remote areas using portable equipment, *Technical Bulletin*, Vol. 25, pp. 89, Ottawa, 1970

[11] Day, T.J., Field procedures and evaluation of a slug dilution gauging method in mountain streams. *Journal of Hydrology (New Zealand)*, Vol. 16, pp. 113–133, 1977.

[12] Kite, G.W., Computerized streamflow measurement using slug injection, *Hydrological Processes*, Vol. 7, pp. 227-233, 1993

[13] Hudson, R. and J. Fraser, Introduction to salt dilution gauging for streamflow measurement Part IV: The mass balance (or dry injection) method, *Streamline Watershed Management Bulletin*, Vol. 9, No. 1, pp. 6–12, 2005

[14] https://stanice.fiedler-magr.cz/index.php

[15] Comina, C., M. Lasagna, D. A. De Luca, and L. Sambuelli, Discharge measurement with salt dilution method in irrigation canals: direct sampling and geophysical controls, *Hydrology and Earth System Science Discussion*, Vol. 10, pp. 10035– 10060, 2013.

[16] http://www.sontek.com/productsdetail.php?FlowTracker-Handheld-ADV-1

[17] http://www.ysi.com/productsdetail.php?Professional-Plus-18

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CHAMBER RESTRICTED ENVIRONMENTAL STIMULATION AND HEART RATE VARIABILITY

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Abstract: The aim of the study is to answer the research question whether environment with restricted environmental stimulation (REST) influences the functioning of the autonomic nervous system (ANS). This method has two forms, depending on the environment in which it is implemented; flotation REST and chamber REST. The criterion of the effect on ANS is measuring the heart rate variability (HRV). A pilot research of chamber REST (a variant on the Dark Therapy; DT): in co-operation with dr. Andrew Urbiš from Beskydy Rehabilitation Centre in Čeladná (BRC) we commenced measuring HRV with the help of an emWave2 device in clients prior to and after a week of chamber REST (DT). From the data obtained from the measurements we can tentatively make the preliminary conclusion that HRV tends to increase after a week of DT. The details are shown in the article below. Thanks to the findings from this stage of measurement, we are preparing a more elaborated experimental study of a greater extent that will begin at the end of 2014.

Keywords: restricted environmental stimulation; REST; chamber REST; dark therapy; heart rate variability

1. Introduction

The paper includes a short theoretical introduction in the REST techniques and heart rate variability. In the research section we are describing the pilot experimental study of a small extent. It was based on the measuring of HRV in six individuals undergoing the procedure of flotation REST and consisted in measuring the HRV in thirteen individuals undergoing a week of dark therapy in BRC. The measuring was carried out in the morning before the procedures started and a week later, in the morning, after the end of the procedure. Apart from the experimental group, we created a control group without any intervention.

We research REST, in particular the specific variant called dark therapy, based on continuously increasing supply and demand for the therapy not only in the Czech Republic, but also Slovakia. This increased interest, as well as our own experience, has been the impulse for us to research the effects of the techniques in greater detail. The study is our first attempt at investigating the effects of DT on human physiology, in particular on HRV. We measured HRV with an emWave2 device.

Even though the emWave2 has not been used in research often, we consider publishing the data as meaningful. Mainly for their inspirational information value - the pilot data presented below may provide guidance for further, more specific and more extensive research. We consider that as the main benefit of the paper, i.e. presenting a modest basis as a basis for further research.

2. Theoretical basis

2.1. Restricted environmental stimulation (REST)

The REST techniques are based on previous experiments with sensory deprivation (SD). The experiments investigated the effect of variability and reduction of environmental stimulation to a minimum extent. This includes social stimulation, i.e. social isolation is a part of that. These experiments were terminated because they were connected with touchless torture and interrogation practices (Zubek, 1969). *Technika omezené zevní stimulace* is a term introduced in the Czech environment as the equivalent for the current English term Restricted Environmental Stimulation Technique (REST) instead of the outdated term of sensory deprivation (Kupka, et al. 2012).

Restricted environmental stimulation thus includes the above-mentioned reduction of environmental stimuli to the minimum, in particular any visual and auditory stimuli, the decreased diversity applies to all other sensory modalities as well as social contact - depending on the selected type of restricted environmental stimulation (we will use the acronym REST as the equivalent in its general meaning) and its particular form. There are three basic forms: flotation REST, chamber REST and immersion REST (Lilly, 1977; Suedfeld, 1980; Zubek, 1969).

The research of REST shifted (compared to the predominant focus of previous experiments with SD) to revealing the medical and therapeutic possibilities of the methods, in particular in reducing the level of stress and its negative impacts on human organism (Suedfeld, 1983, 1999). And that is the area of our research focus where we are mapping the specific phenomenon in chamber REST - the DT variant, in our conditions. The reason for that is an increasing interest in these methods both among general and professional public in recent years.

For the purposes of this paper we will discuss only the variant of chamber REST (in the above-mentioned Czech modification called dark therapy; Malůš, et al., 2013).

2.1.1. Dark therapy (chamber REST)

Environment with restricted environmental stimulation darkness, quiet and solitude - is known to our general public as *dark therapy*. It was PhDr. Andrew Urbiš (2012) who established this term in the Czech Republic. He works in the Beskydy Rehabilitation Centre (BRC) as a therapist. The principle of DT, as implemented in the Czech Republic, is a stay of an individual in absolute darkness, quiet and solitude for a period of at least a week (or multiples thereof). Most often it is performed in simply, however functionally furnished room. There is a bed, a comfortable armchair, a shelf or a side table. There is also a toilet, a washbasin and a shower in the room. Sufficient quantity of food and drink is provided once a day. The person stays in this space continuously usually for seven days. Shorter stays are possible, however, it is recommended to stay for seven days which is a certain basic cycle in which we normally live. In BRC Čeladná this facility includes also an Orbitrek elliptical trainer, a sophisticated recuperation unit for continuous and silent ventilation and a one-way communication device. By this telephone the client may reach three places 24/7 - his guide (caretaker, therapist), the nurses and doctors at the rehabilitation centre. If needed, the client can end his stay at any time - he can unlock the door and leave the room.

The difference compared to the original research of REST techniques consists in several factors. The most important one is the context, because in our place the individualsclients seek and undergo the DT service voluntarily, for a payment, as they consider it meaningful. Another factor is the length of time mentioned above, basically one week and more. In the original experiments the research context was such that the individuals underwent one to three-day stays, they were hired as volunteers and were paid for the stay (Suedfeld, 1999). We must not neglect the person and personality of the guide - a therapist who helps the clients process whatever is important and topical for them that emerges during the stay. We also need to mention the spiritual dimension spread by Holger Kalweit (2006) in Europe (introducing DT in the 1990s in Germany under the name of die Dunkeltherapie) which influenced many people interested in DT.

2.2. Heart rate variability (HRV)

Even though the heart function may be influenced by a number of physiological factors, the most important one is the autonomic nervous system (ANS), especially the sympathetic and the parasympathetic part (Čihák, 1997).

Heart is an organ abundantly innervated with sympathetic and parasympathetic fibres. ANS is responsible for fast regulation of rhythm and the transmission system during the day when the organism is exposed to a great number of exogenous stimuli - e.g. physical and mental stress or during the changes of body posture.

Heart rate (HR) oscillates in the course of time. These physiological oscillations are influenced by many factors (psyche, thermoregulation, acid-base balance, blood gases, blood pressure, hormone concentration, breathing, immune system dysfunction etc.) (Čihák, 1997).

The value of average HR applied traditionally only reflects the final effect of a number of regulatory influences on the cardiovascular system and is characteristic of certain feature of a completed homeostatic chain (Baevsky et al., 2004). The simplest way of demonstrating the effect of autonomous modulation is monitoring the HRV. Thus it may be stated that HRV is used as an autonomous tonus marker (Stejskal & Salinger, 1996).

The diagnostics of heart rate variability is one of the methods of analysing ANS. Heart rate variability shows the changes in the beat to beat interval. Autonomic nervous system consists of two branches - sympathetic and parasympathetic, that usually work in an opposing way. While the sympathetic system is present in processes requiring fast reaction (keeping the organism alert), the parasympathetic system is present in processes taking place in resting state. On the whole, the parasympathetic system participates in the protection and restoration of homeostasis, the protection and replenishing of energy reserves (Placheta, 2001).

2.2.1. The difference between high and low HRV

Heart rate variability thus shows the condition of our organism. From the results recorded by the device, individual components of HRV may be analysed. The components are obtained by translating the RR intervals between subsequent contractions of the heart, numerically expressed in milliseconds into a spectral image of 0 to 0.5 Hz rate range (Placheta, 2001, Stejskal & Salinger, 1996). High HRV indicates high adaptive capacity and is a sign that the individual is healthy, having well-functioning autonomic control mechanisms. It is related with a rather good state of health and recuperation after an illness. On the contrary, low HRV is often an indicator of an abnormal or insufficient adaptability of the ANS. It is an indicator of low parasympathetic activation (Pumprla et al., 2002).

2.2.2. emWave2

The device measures HRV expressed by the term of coherence (low, medium and high). It is a term used to describe internal psycho-physiological coherence (Murata et al., 2004). It describes the level of harmony or disharmony both in our psychological (mental and emotional) and physiological (bodily) processes. The higher the value of coherence, the higher the level of psycho-physiological coherence, therefore the optimum functioning of ANS. The research shows that when we reach such a state, our physiological systems function in a more effective way, there is greater emotional stability and the cognitive functions improve (Tiler et al., 1996; Bradley, et al., 2007).

The term of psycho-physiological coherence is closely related to ANS balance and the device translates it in three levels: Low, Medium and High. The proportion of the three levels of coherence is shown in percentages. The more high coherence and the less low coherence, the higher the HRV is and vice versa. Low coherence is characterized by lower ANS balance, as opposed to high coherence which corresponds with a more balanced and optimal functioning of the heart as well as ANS (McCraty, 2001).

3. Description of the experimental and control group **3.1** Experimental group

The basic group consists of individuals who underwent the intervention by dark therapy at BRC Čeladná from

September, 2013 to the end of April, 2014. The individuals were the clients of a service called dark therapy which they decided and paid for on their own.

The selective group consists of individuals from the basic group described above who underwent a week's stay and gave their consent to HRV measuring with the help of an emWawe2 device. The basic group consisted of 13 individuals of the average age of 46 years, 7 men and 6 women.

3.2 Control group

Apart from the selective group undergoing the intervention with DT, we created a control group without any intervention of the same number of 13 individuals (the average age was 49 years, 6 men and 7 women). The group consisted of academic workers of Palacký University and other individuals gathered by the snowball method who volunteered and gave their consent to HRV measuring with an emWave2 device.

4. Methodology

4.1 Experimental group

In the experimental group we share data obtained by PhDr. Andrew Urbiš on his own initiative. He started to implement test-retest measuring of the clients with an emWave2 device during the admission interview prior to commencing the week's DT and during the final interview after the stay. The measuring was always done in resting state, in sitting position, for five minutes. Even though it is not a standardized ortoclinostatic test lying - standing lying, we decided to use the data as they showed significant shifts. We carried out a statistical analysis of the data.

4.2 Control group

As we could not influence the process of obtaining the data from the experimental group, we created a control group (without any intervention) where we measured HRV with the help of an emWave2 device with the same lapse of time and in the same manner (i.e. a five-minute measuring in resting state in sitting position with a week's time lapse) in individuals in the group of the same number and the closest composition possible (from the point of view of average age and sex). The control group was created in order to establish whether there is, even without intervention, any statistically significant shift between the first and the second measurement.

Even though the emWave2 device is primarily a training and therapeutic tool, we used it in a diagnostic way. We neither instructed the subjects concerning the modification of breathing nor showed to them the values achieved during the measurement (i.e. we did not use the biofeedback features of the device). The individuals received feedback concerning the values measured only after the second measurement in order to reduce the possibility of the second measurement being influenced by their inner expectations.





Figure 1: Confidence intervals for low coherence, comparison of the experimental and the control group; Difference in the level of improvement is not significant: t(24) = -1.65; p = 0.31; d = -0.65.

5.2 Results for the differences in "high coherence"



Figure 2: Confidence intervals for high coherence, comparison of the experimental and the control group; Experimental group improved significantly more than control group: t(24)=3.20; p < 0.01; d = 1.26.

5.3 Results for the differences in "high coherence - low coherence"



Figure 3: Confidence intervals of the percentage difference between high-low coherence, comparison of the experimental and the control group; The experimental group improved significantly more than the control group: t(24) = 2.70; p < 0.05; d = 1.06. 60



5.4 Results for the differences in heart rate

Pretest

experimental and the control group; Average HRs of both groups showed significant differences during the second measurement, however, the difference in the change of the HRs between the groups is not statistically significant.

Figure 4: Confidence intervals of HR, comparison of the

Posttest

5.5 Results - summary table with statistically calculated values measured with the emWave2 device

Table 1: Summary table for all tested values

Sagla	Mean S. de		S. dev	viation		t-test		Effect
scule	Exp.	Con.	Exp.	Con.	t	df	р	size
Low	-18.69	15	35.64	19.23	-1.65	24	0.11	-0.65
Med	-5.77	2.46	35.41	12.91	-0.79	24	0.44	-0.31
High	24.46	-2.31	24.44	17.61	3.20	24	< 0.01	1.26
High -Low	43.15	-2.15	49.81	34.54	2.70	24	< 0.05	1.06
HR	5.69	3.38	11.61	5.71	0.64	24	0.53	0.25

Note to Table 1: Exp. = experimental group; Con. = control group; Significant values are in bold type. Significant differences are the group differences in the scales "coherence high" and "coherence high-low.

6. Conclusion and discussion

The results of our study proved that in individuals subjected to the conditions of the chamber REST (dark therapy variant), compared to the control group, there was a significant increase in "high coherence" and a decrease in "low coherence" in their heart action.

We consider the results of the study as inspiring and worthy of further investigation, however, we are also aware of the limits of the study, which were several. Firstly, from the point of view of the methodology of measurement, standardized ortoclinostatic test was not applied; it will be a part of the follow-up study. Secondly, the emWave2 device is designated primarily for training, therapeutic practice or personal use. It is not originally intended for diagnostics, therefore it may not be easy to use the terms it operates with and translate them to the usual medical terms. Despite these drawbacks, the statistical analysis (despite the small size of the group) suggests that even the emWave2 device may provide meaningful data. The emWave2 device measures hear action and its variability (which is influenced by ANS) which statistically significantly increases after a week's stay in dark therapy, compared to the control group (which shows no change). Even though the device works primarily with the specific terms of low, medium and high coherence, we know that low coherence corresponds with low variability and high coherence corresponds with high variability.

It remains the task of further studies to provide a more precise terminological clarification. Thus we plan, as a part of a follow-up study, to compare the data from emWave2 with tested devices for monitoring HRV.

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References

[1] Bradley, R. T., McCraty, R., Atkinson, M., et al. (2007). Reducing Test Anxiety and Improving Test Performance in America's Schools. Boulder Creek: Institute of HeartMath.

[2] Čihák, R. (1997). Anatomie 3. Praha: Grada Publishing[3] Kalweit, H. (2004) Dunkeltherapie. Die Vision des inneren Lichts. Bercker: Koha.

[4] Kupka, M., Malůš, M., Kavková, V., Řehan V. (2012). Limited outer stimulation technique. Československá psychologie, 56(5), 488-499.

[5] Lilly, J. C. (1977). The Deep Self. New York: Simon & Schuster.

[6] Malůš, M., Kupka, M., Kavková, V. (2013). Technika omezené zevní stimulace (REST): výpovědi ze tmy. In A. Neusar (Ed.), Kvalitativní přístup a metody ve vědách o člověku XII: Hranice normality, 322-330. Olomouc: Univerzita Palackého.

[7] McCraty, R. (2001). Science of the heart. Boulder Creek: Institute of HeartMath.

[8] Murata, T., Takahashi, T., Hamada, T., Omori, M., Kosaka, H., Yoshida, H., & Wada, Y. (2004). Individual trait anxiety levels characterizing the properties of Zen meditation. Neuropsychobiology, 50(2), 189-194.

[9] Placheta, Z., Siegelová, J., Svačinová, H., Štejfa, M., Jančík, J., Homolka, P., & Dobšák, P. (2001). Zátěžové vyšetření a pohybová léčba ve vnitřním lékařství. Brno: Masarykova univerzita.

[10] Pumprla, J., Howorka, K.,Groves, D. Chester, M.,Nolan, J. (2002). Functional assessment of heart rate variability: physiological basis and practical applications. International Journal of Cardiology, 84(1).

[11] Stejskal, P., Salinger, J. (1996) Spektrální analýza variability srdeční frekvence. Med Sport Bohem & Slovaca, 5(2).

[12] Suedfeld, P. (1980). Restricted Environmental Stimulation: Research and Clinical Applications. New York: John Wiley and Sons.

[13] Suedfeld, P., Ballard, E., Murphy, M. (1983). Water immersion and flotation: From stress experiment to stress treatment. Journal of Environmental Psychology, 3, 17-25.
[14] Suedfeld, P. (1999). Health and therapeutic applications of chamber and flotation restricted

environmental stimulation therapy (REST). The International Journal of the Addictions, 14, 861–888.

[15] Urbiš, A. (2012). Terapie tmou: návrat k harmonii a

[16] Cross, A. (2012). Forapic unout naviat a nav Crofts.

CONCEPTUAL SPORTS METAPHORS MONDAY QUARTERBACK FOR OTHER DISCOURSES

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Abstract: Generally understood as the linguistic/semantic structures represented in the written and spoken medium, discourses represent the sociolinguistic phenomena, whose analysis merits scientific importance; they are closely linked to the means by which a society is governed and managed. Other life discourses, in this particular case, political one, cannot do without sports language. This cohabitance of linguistics units is the scope and aim of this paper. The identification of metaphor clusters or bursts requires the analyst to decide which increases in use are sufficiently distinct from the immediately previous discourse to warrant labelling as clusters. The extra information about Vehicle domains available in the visual display showed cluster boundaries more clearly than in a cumulative frequency graph. Media commentators have long bemoaned a style of campaign coverage known as "horse-race journalism," in which the contest becomes everything. Soon this interminably long race will be over - it is a marathon not a sprint - and there will follow another of the great rituals of campaign coverage. Correspondents will identify the single moment the election was won or lost, or the strategy or move that led to defeat. Needless to say, the Americans have a name for this kind of post-match analysis: Monday morning quarterbacking. In a word, it seems no sphere of life can do without sports language, so the sooner we realize the better for us all. The sooner we educate our students to use the wealth of sports language in other domain discourses the better life rank awaits them.

Keywords: discourse, power, politics, language, communication

1. Introduction

The focus of research shifts from the structure of language on its functions and specific practices related to the particular context. Based on these shifts, poststructuralist and constructionalist comprehensions of a discourse go a step further in the direction of functionalism with the process of identifying discourse signification, the creation of meaning. The concept of discourse gains thus specific meanings, irreducible to the existing linguistic and vocabulary definitions. The discourse is seen as a kind of a linguistic structure, which social use represents a specific exertion of power. By linking the notion of discourse with the concept of power in his research, Michel Foucault gave the main impetus to these studies. Foucault sees a discourse as a power that should be won. Thus, the power is a discursive category, the vacant position that can be occupied by individuals and institutions.

Metaphor, whether conceptual or linguistic, from the discourse dynamics perspective becomes processual, emergent, and open to change. Rather than seeing metaphor as a 'tool' or some other kind of object that is put to use, a processual view attends to metaphor activity. Through self-organization and emergence, metaphors and systems of metaphors can stabilize out of use. That stability too though is dynamic, open to further change, and accompanied by flexibility. The flexibility or variability around stabilized phenomena allows the possibility of further change in the continuing flow of discourse. Linguistic metaphors, or rather 'metaphoremes' (Cameron & Deignan, 2006), stabilize as idiomatic or preferred forms and associated pragmatic and semantic features that emerge from interaction. Depending on communicative activity, they may continue to change or they may remain in the stabilized form for a long period of time.

1.1 Methods – Corpus sample

The topic of a linguistic metaphor is the real world referent of the vehicle word or phrase in spoken interaction. There is often no explicit topic verbalized. The extra information is itself not very specific: there is no evidence to warrant a more specific interpretation. Given also that we were dealing with more than 1000 linguistic metaphors in each transcript, it became impractical to work out and agree specific topics for each vehicle. Our solution was to streamline topic coding by constructing and using a limited set of key discourse topics relevant to our research topic and research questions. Thus, "system" was allocated to the key topic: responses to terrorism (coded as 3) and one of its two sub-topics, responses to terrorism by the authorities (coded as 3a) (the other being, responses to terrorism that affect minorities (3m)). The three other key discourse topics were: politics (elections) and terrorism (including acts of, risk of, causes of, perpetrators (coded 1)); communication about politics and terrorism (coded 2) (with sub-topics: communication about politics and terrorism by the media (2n) and communication about terrorism and the politics by the authorities (2a)); society and social groups (coded 4) (with a sub-topic: minorities in society (4m).

1.2 Political language segmenting and sports metaphors The language of politics is abundant in sports metaphors. When analyzing the current political situation one often hears: True, we have not quite reached **the bottom of the ninth** (the final, often dramatic, inning of a baseball game). In the election period we could also encounter the following: It is probably too early for the **frontrunner** (Barrack Obama) to start **running down the clock** (cautious tactics used by the team ahead in the final minutes of a basketball match designed to protect its lead). When talking about the running candidates as the opponents the newspapers report something like this: Three presidential debates still lie ahead, where Mitt Romney will doubtless be looking for a **knock-out punch** (one of the few analogies that requires no translation outside the US). Even after the debates, there may still be time to hurl a **Hail Mary pass** (a desperate long pass thrown by the quarterback in the dying minutes of an American football game in the hope of getting a touchdown). Certainly, he needs a **game-changer** (some dramatic "play" that will upend the contest).

Across the political Anglo-sphere, the language of sport often doubles as the language of politics. At Westminster, cricketing metaphors are not uncommon. The sticky wicket, the straight bat, the hit-for-six. When the former Conservative Chancellor Geoffrey Howe delivered his dramatic resignation speech attacking Margaret Thatcher, he likened her handling of negotiations with Europe to "sending your opening batsmen to the crease only for them to find the moment the first balls are bowled, their bats have been broken before the game by the team captain." In Australia, the preferred national metaphor is a sporting one: the country punches above it weight. In the daily rough and tumble of Canberra life, politicians also often accuse each other of playing the man not the ball. In Canada, ice hockey naturally provides the analogies. Politicians are sometimes described as pylons (hopeless defenders that attackers can skate round at will). Occasionally they have to stickhandle an issue (which means to retain possession of the puck with some artful individual stick play).

Still, it is in US presidential politics that sports-speak is most prevalent. During the convention season, the test of a speech is whether it is **hit out of the park** or remains within the confines of the auditorium - which, fittingly, now tends to be a sports arena. At the Democratic convention in Charlotte, for instance, Bill Clinton was deemed to have **hit a home run** for Obama. The previous night, the First Lady Michelle Obama had also **swung for the fences** and connected. It is often more than necessary to introduce the lay public into the language of sports metaphors. Here are some of these metaphors:

Front-runner: An athlete or horse that leads the race, Punching above one's weight: When a boxer fights someone in a heavier weight category, To hit a home run: To hit the baseball far enough to give time to circuit bases and score a run, Swing for the fences: Swing the bat as hard as possible, aiming for the stadium perimeter, Step up to the plate: Take your turn at the batting plate in baseball, Knock-out punch: A hard punch that floors the opponent.

In the coming days, as we approach the televised debates, boxing will supply the metaphors. The talk will be of **knock-out punches**, even though relatively few debates have finished with much blood on the canvas. In the classic Kennedy-Nixon debates in 1960, the first in US

political history, it was not the then Vice-president's glass jaw that was the problem but rather his sweaty upper lip. Go back and study the tapes: from Kennedy, you will not find a **smack-down** blow. Success in the debates often upon the winning candidate **the** bestows Big Mo (unstoppable momentum); a phrase that has become such an integral part of the political vocabulary that it is easy to forget that it comes from 1960s gridiron football. Earlier this month, as the college football season got under way, Mitt Romney urged voters to hire a new coach because "it's time for America to see a winning season again." Obama responded in kind with a string of sporting analogies: with an economic play-book so badly flawed, he said, Romney would produce a losing season. Rick Perry optimistically compared himself to quarterback

1.3 Statistical data processing

The identification of metaphor clusters or bursts requires the analyst to decide which increases in use are sufficiently sudden or distinct from the immediately previous discourse to warrant labelling as clusters. By plotting the cumulative frequencies on a graph, increases in use appear as sudden rises in the curve, i.e., they become visually identifiable. However, reliability and validity in visual identification are affected by the unit chosen to divide the discourse. The visual displays created using the VisDis software proved to be as accurate as the statistical method in identifying metaphor clusters, and for many research purposes will be 'reliable enough'. The extra information about Vehicle domains available in the visual display showed cluster boundaries more clearly than in a cumulative frequency graph.

2. Results

Tim Tebow.

BASEBALL METAPHORS

1. (throw) a curve (ball) - "unexpected, surprising, even deceptive event"

As the Oscars roll towards us, the Berlin film festival has thrown the world a curveball by picking as best film the most thoroughly anti-Hollywood offering you can imagine. [The Guardian (London), Feb 20, 2009]

2. step up to the plate - "take on or accept a challenge or responsibility"

Some of our senators and representatives say the Iraqis should step up to the plate and reconcile their differences; others say we made the mess and we should stay in Iraq until there is a return to stability. [New York Times (USA), Apr 10, 2008]

3. be off base - "be completely wrong"

But, unfortunately, the party's assessment of its own strength is way off base. [Hindustan Times (India), Feb 8, 2009]

4. out P left field - within: "a state or position far from the mainstream"; "not knowing what's happening"; with of/from: "a source of the unexpected or illogical"

Kerry Keady, a solicitor representing three leaseholders, said the revoking of leases "came completely out of left field". [Sydney Morning Herald (Australia), Feb 15, 2008]

5. have two/three strikes against - "condition or situation that makes it extremely difficult to be successful"

When Jesus Montero, 28, immigrated from Peru six years ago to join his mother and begin a new life in New York, he had three strikes against him. Mr. Montero is deaf, he cannot speak, and he reads only "a little Spanish and less English," he said last month through a sign-language interpreter. [New York Times (USA), July 8, 2007]

CRICKET METAPHORS

1. a sticky wicket - "difficult or tricky situation"

The Assam Government is on a sticky wicket by not holding Panchayat elections within five years of its constitution as provided under Article 243(E)(3) of the Constitution of India. [Hindustan Times (India), Mar 17, 2007]

2. (just) not cricket - "unfair or unjust"

Gentlemen's agreements ought to be sacrosanct and the behavior of the Russian leader was just not cricket. [The Observer (UK), July 22, 2007]

3. V a straight bat - "offer a noncommittal or evasive answer to a question"

On immigration, Ms Smith has played a very straight bat - acknowledging concerns about east European migration but stressing the benefits it has brought. [The Guardian (UK), June 29, 2007]

4. have a good innings - "having spent a long time doing smth., having had a long, successful life"

None of my immediate family has died early and my grandparents all had reasonably good innings, except for my paternal grandfather who died of a heart attack in his 60s. [The Guardian (UK), Dec 9, 2008]

5. hit for six - "score a big success", "being astonished or amazed by smth.", "being devastated"

The corporate regulator has had its landmark lawsuit against the world's biggest bank hit for six after it failed to prove the very basis of its case. [Sydney Morning Herald (Australia), June 29, 2007]

FOOTBALL/SOCCER METAPHORS

1. play it safe - "act carefully, avoid risks"

Michael Davison, super policy adviser at CPA Australia, says that in the past advisers would tell their clients to play it safe by limiting their investment to equity warrants and installments. [Sydney Morning Herald (Australia), Dec 12, 2007]

2. V an own goal - "creating a problem by achieving the opposite effect from what was intended". The Liberal Democrat's home affairs spokesman, Chris Huhne, said: "It beggars belief that the government could have scored such a devastating own goal on the very day that it was pushing draconian counter-terrorism laws through parliament.". [The Guardian (UK), June 12, 2008]

3. V the back of the net - "be successful". As Lev's Irish landlord Christy says, with some prescience: 'Life's a feckin' football match to the Brits now. They didn't used to be like this, but now they are. If you can't get your ball in the back of the net, you're no one.' [The Observer, (UK), June 10th, 2007]

4. V the ball rolling - "start smth. happening"

In 2001, King Jigme Singhye Wangchuck set the ball rolling for Bhutan's transformation from an absolute monarchy to a parliamentary democracy, which led to a new draft constitution. [Hindustan Times (India), Jan 1, 2008]

5. V the goalposts – "change the rules, limits etc for something while someone is trying to do something, making it more difficult for them". As they try to play the game in a situation of constantly shifting goal posts, South Africa's mining companies are about to take some tough strategic decisions. [Sunday Times (South Africa), Feb 03, 2008].

3. Discussion

Use of metaphorical expressions across sport types

a) American Michael Phelps got the ball rolling, smashing Ian Thorpe's 200m freestyle record to claim gold. (Sydney Morning Herald, Mar 28, 2007)

b) Yet, it wasn't all William's work. Safina scored some own goals, starting with three double faults in her first service game. (Sun Herald, Feb 1, 2009)

c) In order to advance from a heat, many surfers take what waves they can catch and play it safe for sure points. (NYT, Nov 27, 2007)

d) After the week Craig Pickering has had - winning his second major 100metres senior international meet in Ostrava following victory at the European Cup last weekend - the 20-year-old Bath sprinter says the goalposts keep changing as he prepares for his next race, the IAAF Grand Prix in Athens, tomorrow evening. (The Observer, July 1, 2007)

e) Understandably, McClaren played a straight bat, and would only repeat that he had picked a team to beat Estonia in next week's qualifier. (The Guardian, May 28, 2007)

f) Football: Championship: Wolves' promotion hopes hit for six but omens may provide comfort (The Guardian, Apr 2, 2007)

g) The sport's leaders will be hoping that Jamaica's Asafa Powell or America's Tyson Gay can step up to the plate in the 100m to help bring these championships alive. (The Observer, Aug 26, 2007)

h) The first was the decision, made not in haste before the Wellington Test but in the immediate aftermath of New Zealand's first-innings 470 in Hamilton, to drop not just Steve Harmison but, straight out of left field, Matthew Hoggard as well. (The Guardian, Mar 27, 2008)

6. Conclusions

Linguistically speaking, one question is always posed: should sport and politics mix? Media commentators have long bemoaned a style of campaign coverage known as "horse-race journalism," in which the contest becomes everything - although a better description might be "playby-play journalism. "Strategies and tactics subsume policies and ideas. Politicians tend to be judged as players in the political game, rather than as potential leaders. Soon this interminably long race will be over - it is a **marathon**, remember, not a **sprint** - and there will follow another of the great rituals of campaign coverage. Correspondents will identify the single moment the election was won or lost, or the strategy or move that led to defeat - which will seem obvious now, even if it wasn't at the time. Needless to say, the Americans have a name for this kind of postmatch analysis: **Monday morning quarterbacking**. To conclude: it seems no sphere of life can do without sports language, so the sooner we realize this fact the better for us all.

References

[1] Fairclough, N. (1996). Critical Analysis of Media Discourse, *Media Studies: A Reader* (eds. P. Marris – S. Thorntam). "Edinburgh University Press": Edinburgh.

[2] Grimshaw, A. (2003). Discourse and Sociology: Sociology and Discourse. *The Handbook of Discourse Analysis*. Schiffrin, Deborah, Deborah Tannen and Heidi E. Hamilton (Eds.), Blackwell Publishing.

[3] Dijk, T. A. Van. (2010). *Text and context: Explorations in semantics and pragmatics of discourse*. New York: Longman.

[4] Pirsl, D. (2010). English in Physical Education and Sport. Faculty of Sport and Physical Education. University of Nis.

[5] Pirsl, D. (2011). Rhetorical structures of sports discourse. Unpublished doctoral dissertation. University of Novi Pazar.

[6] Van Dijk, T. A. (2003). Critical Discourse Analysis. The Handbook of Discourse Analysis. Schiffrin, D., Tannen, D and Heidi E. Hamilton (Eds). Blackwell Publishing.

[7] Willa, D. (2002). Postmodernism and the Public Sphere. *The American Political Science Review*. Vol. 86, no 3. pp. 712-721.

HEAD TEACHERS' PROFESSIONAL DEVELOPMENT AT SCHOOLS PROVIDING COMPULSORY EDUCATION

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Abstract: Head teachers play vital roles in the development of individuals such as teachers and students, as well as the development of the schools as organisations. Meanwhile, their own professional development is also important. This demand of head teachers' professional development comes not only from different national standards set for compulsory school education, but also from head teachers' working responsibilities. This paper presents results of the analysis of existing research concerning the head teachers' professional development, which indicate that supporting the development of others is an effective way to facilitate their professional development.

Key words: head teacher, professional development, compulsory education.

1. Introduction

The access to education for 5-14 year olds is universal in all OECD and most partner countries [1]. However, the role of head teachers who have an overall responsibility for the management, leadership and governance of the schools, their staff, pupils and quality of the education have been rediscovered in recent years. "Never in the history of our educational enterprise has the school leader been faced with such complex responsibilities and so many change forces, both internal and external" [2]. Guskey also stated "Never before in the history of education has greater importance been attached to the professional development of educators. Every proposal for educational reform and every plan for school improvement emphasizes the need for high-quality professional development" [3]. However, "not only few would dispute the fact that 21 century school leaders are finding it difficult to keep up with the pressures brought to bear on their profession" [4]. Therefore, this paper pays attention to head teachers' own professional development, to be more precise to characterise this concept from two different perspective: from the findings of the existing research and from the perspective of educational policies in particular countries.

2. Compulsory education

The length of compulsory education varies across countries. The difference exists in many aspects, such as entrance age, enrolment rate and the length of compulsory education. For instance, in Czech Republic school attendance is compulsory for 9 years, usually from the age 6 to 15 [5], mostly at basic schools (základní škola); The length of compulsory education is also 9 years in China, usually from 6 to 15 years old, but in some areas, the age of entry could be postponed to 7 years old[6]. The compulsory education in most of them partner countries, and upper secondary education in most of them partner countries, and the enrolment rates among 5-14 year-olds are higher than 90% [7], that means for all OECD and most of the partner countries, there existed universal basic education and

therefore an universal issue of quality professional development of head teachers' of schools providing compulsory school education. Their professional development is crucial not only because of their key role in schools but also due to the fundamental status of compulsory education in the current society and the essential functions that these schools fulfil.

3. Head teachers' professional development

The professionalization tackles the professional development of both individuals and the "twofold occupation/profession". The logic premise is to admit that head teachers profession combines the teachers' profession managers'/leaders' profession. However, an and occupation which can be called profession needs to meet professional standards. In this paper, two questions are what is head teachers' professional addressed: development? How is this issue vied from the perspective of educational policies?

Professional development can be defined as "the processes and activities designed to enhance the professional knowledge, skill, and attitudes of educators so that they might, in turn, improve the learning of students, in some cases, it also involves learning how to redesign educational structures and cultures" [8]. At the same time, professional development "includes opportunities for continuous skill and knowledge acquisition with the effort to create effective learning opportunities for teachers and students" [9]. The head teachers' professional development undoubtedly includes "the creation of the effective learning opportunities for teachers and students" [10].

In 1977, Huge put forward three ways for school leaders to assist the growth of staff. "Each principal knows each staff member very well. He/she knows their strengths, their weaknesses, and organizes the school around these factors; all of these principal invest considerable time in assisting teachers in setting job targets not only in relation to the goals of the school but in areas of individual strengths; these principal also recognize that change is not an easy process and that each human being has a different rate of change" [11]. In this respect, Hord outlined the role of principals as teacher educators and supporters. Nevertheless, it's interesting that many scholars and researchers within this field pay great attention to describing the head teachers' role as one of directing, overseeing and participating in teachers' professional development or described the importance of head teachers' active involvement in teachers' development in professional practice schools [12]. It is a distinction that can be argued as having deflected teacher educators' attention away from specifically delineating the principal's (head teacher) role and in supporting teachers' development. Till 1992, Liethwood described teacher development as "the most central function of educational leadership". He went on to explain the difficulties what principals (head teachers) faced in fulfilling this function, "Even principals who acknowledge their saving: responsibility to foster teacher development often claim that is not a function they feel capable of performing well" [13].

Nonetheless, many educational administration scholars recognized the principal's role in teachers' development and link it to the popular notion that principals are supporters and instructional leaders [14]. "We no longer believe that one administrator can serve as the instructional leader for an entire school without the substantial participation of other educators" [15]. Other researcher also stated that "the role of the principal as an instructional leader includes attention to and support of teachers' professional development [16]. This trend is even strengthened by replacing the concept of "principal/headmasters" by "head teachers" in the recent years.

Apparently, to support of teachers' and students' development is one of the most important components of head teachers' professional development. This includes "to create effective learning opportunities for teachers and students" [17].

As to the supporting role of the head teachers, the study by Blase and Blase [18] need to be further illustrated. They presents data from an extensive qualitative study of what teachers identify as principals characteristics of those who had a positive effect on teachers' classroom instruction. These researchers also identify the strategies that use to effectively support teachers' principals development: "having positive perceptions of teachers' capabilities; balancing the delicate interaction between support and pressure by letting go of traditional role expectations and also by encouraging teachers to take on new roles; developing shared vision and values; supporting shared decision making; promoting continuous learning; engaging all teachers and administrators in collaborative reflection, inquiry, problem solving, learning, and teaching; and providing regular opportunities to learn and grow"[19]. Besides, individual recognition, demonstration lessons, provide specific details and examples of teaching techniques [20].

From the above mentioned research findings, in this study, the head teacher's professional development is perceived as the developing process of their professional knowledge, professional behaviour, and professional attitude which have positive influence on the development of the school, its staff, its pupils and quality of the education provided.

3.1 The concept of head teacher from the perspective of educational policy in particular countries

Different countries apply different strategies and priorities to ensure head teachers' development. The United States is the first country that set standards for school leaders. In 1996, Interstate School Leaders Licensure Consortium (ISLLC) issued "Standards for School Leadership" which was used to deal with the development of school leaders in 20th century. This standard was revised in 2007, and the new version was published in 2008 and named "Educational Leadership Policy Standards: ISLLC 2008". The British government issued "Teachers: meeting the challenge of change [21]" in 1998. The green paper pointed out that: "Good heads are crucial to the success of schools. The best heads are a match for the best leaders anywhere. We need to develop strong leaders, reward them well and give them freedom to manage, without losing accountability". Under these circumstances, "National Standards for Head teachers" was enacted at the same year, and its revised edition was issued in 2004. In May 2014, the British government called for evidence of head teacher standards at their website, and the second vision standards will be issued in the near future.

New Zealand began to implement Performance management systems for principals and teachers in all state and integrated schools since 1997. In 1998, the Ministry of Education of New Zealand issued "Interim Professional Standards: Primary School Deputy/assistant Principals, Primary School Teachers" [22] in the form of consulting report. This report has became one of the most important appraising standards of head teacher since 1999.

The "Australian Professional Standard for Principals [23]" was endorsed by Ministers at the Ministerial Council for Education, Early Childhood Development and Youth Affairs (MCEECDYA) on 8 July 2011. The Standard is a public statement in Australian that sets out what standards principals are expected to know, understand and achieve in their work.

The Chinese Ministry of Education issued "Chinese head teachers Professional Standard in Compulsory Education" [24]. In this standard, the head teacher was expected to assume six professional responsibilities during their working. In the Czech Republic, these standards are still in the process of preparation.

Through content analysis of the above-mentioned national standards, the summary of national standards for headteachers has been presented in Table 1. It indicates that three roles of head teachers are highly expected: the role of a leader, an educator and an administrator. Those different roles mean that head teachers not only need to improve their own knowledge and skills but also need to adequately play several other roles to support the development of the school, teachers and students.

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	Leader	Educator	Administrator
USA	Understanding, responding to, and influencing the political, social, legal, and cultural context; Acting with integrity, fairness, and in an ethical manner;	Developing a school culture and instructional program conducive to student learning and staff professional growth; Setting a widely shared vision for learning;	Ensuring effective management of the organization, operation, and resources for a safe, efficient, and effective learning environment; Collaborating with faculty and community members,responding to diverse community interests and needs, and mobilizing community resources
UK	Shaping the Future; Developing Self and Working with Others; Securing Accountability;	Leading Learning and Teaching;	Managing the Organization; Strengthening Community;
NZD	Policy and Programme Management;	Professional Leadership;	Staff Management; Relationship Management; Financial and Asset Management
Аи	Leading improvement, innovation and change; Developing self and others;	Leading teaching and learning;	Leading the management of the school; Engaging and working with the community;
CN	Set the development planning of school; Construct the education culture;	Leading teaching and learning; Leading the professional growth of staff;	Optimize the internal management; Adjustment of the external environment.

Table 1 National Standards for Headteachers

4. Conclusion

As to the head teachers' professional development, their roles are moving from leading themselves and others towards quality care. The reflection of strategies of educational policy in different countries has shown a wide range of approaches sharing the same milestones. This paper has also brough about several issues that are going to be dealt in the dissertation thesis, such as:

- What kind of professional support does the head teacher provide to the development of the teachers?
- What strategies have the head teacher used to support the development of the teachers?
- What's the characteristic of the head teachers' supporting mode?
- Are there any factors will influence the supporting mode of head teacher?

References

[1] OECD, *Education at a Glance 2014: OECD Indicators*, OECD Publishing, 2014, 306. http://dx.doi.org/10.1787/e ag-2014-en

[2] Creighton, T. *Leading from below the surface: a non-tr aditional approach to school leadership*, Thousand Oaks, CA: Corwin Press, 2005.

[3] Guskey, T. R. *Evaluating Professional Development*, T housand Oaks, Calif. Corwin Press, 2000, 6, 13.

[4] Leonard, J.C. *Finding the time for instructional leaders hip: management strategies for strengthening the academi c program*, Lanham, MD: Rowman & Littlefield, 2010.

[5] Eurydice, Czech-Republic: Overview, 2014. https://we bgate.ec.europa.eu/fpfis/mwikis/eurydice/index.php/Czech -Republic:Overview.

[6] Compulsory Education Law of the People's Republic of China, 1986. http://www.lawinfochina.com/display.aspx?l ib=law&id=1166&CGid=.

[7] OECD, *Education at a Glance 2014: OECD Indicators*, OECD Publishing, 2014, 308. http://dx.doi.org/10.1787/e ag-2014-en.

[8] Guskey, T. R. *Evaluating Professional Development*, T housand Oaks, Calif. Corwin Press, 2000, 6, 13.

[9] Rhoton, J., and P. Bowers. *Issues in science education: Professional development planning and design*, Arlington, VA: NSTA Press, 2001.

[10] Rhoton, J., and P. Bowers. *Issues in science education* : *Professional development planning and design*, Arlingto n, VA: NSTA Press, 2001.

[11] Huge, J. The principle as staff development leader, Ed ucation leadership, 1977, 385-386.

[12] Morine Dershimer, G. Editorial introduction, *Teachin g and Teacher Education*, 2002.18(7), 759-61.

[13] Liethwood, K. The principal's role in teacher develop ment. In M. Fullan and A. Hargreaves (Eds.) *Teacher Dev elopment and Educational Change*. London: Falmer Press, 1992.

[14] Glanz, J. What every principal should know about inst ructional leadership. Thousand Oaks, CA: Corwin Press, 2 005.

[15] Elmore, R. *Building a new structure for school leader ship*. Washington, DC: The Albert Shanker Institute, 2000. www.shankerinstitute.org/Dwnloads/building.pdf.

[16] Payne, D., and Wolfson, T. Teacher professional deve lopment: The principal's critical role. *NASSP Bulletin*, 200 0, 84(618), 13-21; Lambert, L., Walker, D. and Zimmerma n, D. and Cooper, J. and Lambert, M. and Fordslack, P.J. *T he constructivist leader*. New York: Teachers College Pres s, 1995.

[17] Jack, R. and Patricia, B. and Patricia, S. *Professional Development: Planning and Design*, NSTA Press, 2001.

[18] Blase.J and Blase. J. Principals' instructional leadersh ip and teacher development: Teachers' Perspectives, *Educ ational Administration Quarterly*, 1999, 35(3), 349-378.

[19] Blase.J and Blase. J. *Handbook of instructional leader ship: how really good principals promote teaching and lea rning*, Thousand Oaks, CA: Corwin, 2004.

[20] Holland, Patricia, E. The Principal's Role in Teacher Development. *SRATE Journal*, 2009, 16-24.

[21] *Teachers meeting the challenge of change*, 1998. http: //www.educationengland.org.uk/documents/gp1998/teache rs-change.html.

[22] Introduction of Interim Professional Standards for Pr imary School Teachers and Primary School Deputy and As *sistant Principals*, 1998. http://www.edgazette.govt.nz/Art icles/Article.aspx?ArticleId=5111.

[23] Ministers at the Ministerial Council for Education, *Au* stralian Professional Standard for Principals,2011. http://www.aitsl.edu.au/australian-professional-standard-for-prin cipals.

[24] Ministry of Education of the People's Republic of Ch ina, *Chinese head teachers Professional Standard in Comp ulsory Education*, 2013. http://www.moe.gov.cn/publicfile s/business/htmlfiles/moe/s6197/201212/146003.html.

THE ISSUE OF SELECTIVE PROCEDURE INTERPRETING FOR PEOPLE WITH HEARING DISABILITY

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Abstract: This contribution deals with the issue of selective procedure interpreting within the context of people with hearing disability and it is an output of a research. Twenty-eight respondents took part in this research. Professional interpreters for people with hearing disability within the area of the Czech Republic were addressed. The research method of a questionnaire was used for the research. A part of the contribution deals with a choice from the area of interpreting for people with hearing disability and with the notion selective procedure. The analysis of chosen results of the research follows together with conclusion.

Keywords: person with hearing disability, selective procedure, interpreting, Czech sign language.

1. Introduction

The aim of this contribution is to study the issue of interpreting for people with hearing disability regarding the situation of a selective procedure, which is in some way specific and imposes certain requirements to all the parties involved. The research is to provide an insight into this issue. Whether people with hearing disability use interpreting and which way of communication they choose.

1.1 Interpreting for people with hearing disability

The sense of hearing is an important instrument for the input of information. The consequence of its absence is a certain handicap [1].

The means of communication of the majority of society, intact people and possibly also some people with hearing disability is the national language, in this case it is Czech language, which is produced in a written and oral form. On the other hand, a mother tongue and natural language of most people with hearing disability is the national sign language, in this case it is Czech sign language. A different language leads to certain social, interpersonal and cultural differences of some people with hearing disability [2].

The way a person with hearing disability will communicate depends on many factors, not only the hearing impairment itself. All the people with hearing loss are referred to as people with hearing disability regardless of its level, type or origin [3].

The Act n. 384/2008 Sb., on communication systems of people with hearing disability and people with hearing and sight disability, enables communication using appropriate means of communication to the people with hearing disability within the area of the Czech Republic as well as the right to the interpreter during communication. The Act n. 108/2008 Sb., on social services, enables people with hearing disability to draw some interpreting services free of charge. Regarding the fact that organizations providing interpreting services are dependent on the amount of subsidies from the state, it sometimes happens that provision of interpreting services is limited to some areas only.

People with hearing disability communicating primarily by Czech sign language meet a communication barrier. As a result, they use interpreting services. There are several organizations providing interpreting for people with hearing disability within the area of the Czech Republic. The biggest provider of interpreting services is Centrum zprostředkování tlumočení pro neslyšící (The Centre for Mediating Interpreting for People with Hearing Disability). This centre provides its clients with Czech sign language, interpreting into signed Czech, visualisation of spoken Czech (articulated interpreting) and interpreting for clients with hearing and sight disability within the area of the Czech Republic. The centre also defines people the interpreting is intended for:

- Deaf people and people with hearing impairment who prefer Czech sign language or signed Czech when communicating with hearing surroundings,
- Deafened people and people with hearing impairment communicating by speaking, lip reading and in a written form,
- People with hearing and sight disability communicating by specific interpreting using Czech sign language and Lorm's alphabet,
- Hearing people in need to communicate with deaf people, people with hearing impairment, deafened people and people with hearing and sight disability, interpreters of Czech sign language, interpreters of signed Czech, people visualising spoken Czech (former articulation interpreters),
- Interpreters for people with hearing and sight disability and relay interpreters (who are generally referred to as interpreters).

People with hearing disability may order an interpreter and there is also a database of interpreters within the Czech Republic they can choose from [4].

1.2 Selective procedure

A choice of employees is a decisive process when an acceptance or rejection of an applicant for a working position or a function within an organization takes place [5].

An organization creates its own image and appropriate public relations using advertising, reciprocal correspondence and personal contacts. An organization may invite the applicant in several ways. The way the selective procedure is organized creates an image of the organization. It is essential so that the selective procedure is based on principles for the choice of employees. Some of the principles follow: Assess the future employee not only from the point of view "what he can do and what he cannot do", but also what his qualities for particular tasks, which he will carry out, are. It is necessary to choose from a wide range of applicants. Discuss the applicant with people who worked with him previously. In case of acceptance, proceed from the easiest task to more difficult tasks so that an unsuccessful adaptation does not occur. In case that the applicant is not successful, it is not just to blame him. The person to choose the employee is to blame. The choice of employees is based on the following concept: First of all, there is a preliminary choice. This phase includes assessment of written applications (CVs and other documents which the employer required). The choice itself follows when the applicants who were chosen within the preliminary choice are chosen for example on the basis of interview, tests or Assessment Centre [6].

2. Methodology

The primary aim of the research was to establish whether people with hearing disability use interpreting services during a selective procedure and what type of interpreting they most often use. The secondary aim was to establish whether interpreters experienced interpreting of the first day at work of a person with hearing disability and whether clients with hearing disability followingly require interpreting of important meetings or courses within the employment. The base was a quantitative research. The research method of questionnaire was used from the empirical methods for this contribution. Professional interpreters from the whole Czech Republic were addressed. Gender, age, education or the type of interpreting, which they provide, was not taken into consideration. The significant point of the choice was a professional interpreting occupation based on legislative terms. The respondents were addressed via electronic mail and social networking service. They were chosen on the basis of the database of interpreters or on the basis of a personal meeting. The total number of twenty-eight respondents took part in the research. Their average age was thirty-three, 85.71% were of a feminine gender and 89.29% stated university degree as the highest achieved educational level.

3. Analysis of Chosen Results of the Research

1. Have you ever interpreted a situation of a selective procedure for clients with hearing disability?



Figure 1: 78.57% of the respondents answered that they have interpreted a selective procedure for clients with hearing disability. 21.43% of the respondents have never experienced such a situation.

2. If you have experienced interpreting of a selective procedure, what type of interpreting was the most common?



Visualisation of spoken Czech

Interpreting for clients with hearing and sight disabilityOther

Figure 2: 76% of the respondents stated that the most common type of interpreting during a selective procedure was Czech sign language. 3% of the respondents interpreted into signed Czech. 21% stated another option as they have not experienced interpreting of a selective procedure for people with hearing disability so they do not know which type of interpreting is the most common in this situation.

3. Have you ever experienced interpreting of the first day at work for a client with hearing disability?



Figure 3: 64.29% of the respondents answered that they had experienced interpreting of the first day at work for people with hearing disability. 35.71% of the respondents have never experienced interpreting in such a situation.

4. Have you ever experienced interpreting of important meetings or courses (for example Health and Safety) for a client with hearing disability at work?



Figure 4: 85.71% of the respondents answered that they had experienced interpreting of important meetings and courses for clients with hearing disability. 14.29% of the respondents stated that they had never experienced interpreting in such a situation.

4. Conclusion

The result is the conclusion that people with hearing disability use interpreters during a selective procedure, which is proved by the fact that 78.58% of the respondents answered that they had experienced interpreting in such a situation. Simultaneously, it follows that interpreters for people with hearing disability are ordered by clients preferring Czech sign language. It means that these clients with hearing disability do not usually know the national language of the country and as a consequence they have a problem with written communication as well. As a result, there are different not only language but also cultural and social aspects playing a significant part during a selective procedure. These clients with hearing disability are mostly dependent on interpreting due to language barrier; this does not have to limit the quality of their work. We could only recommend informing the applicants on the issue of people with hearing disability and the possibility of interpreting for people with hearing disability in advance.

Interpreting of the first day at work is less common than interpreting a selective procedure. It follows that some people with hearing disability who were accepted for the given position, found a way to communicate with their employer without using services of an interpreter. On the other hand, interpreting important meetings and courses is more frequent, surprisingly even more that the request to have an interpreter during a selective procedure. We can conclude that people with hearing disability view these situations as important as they are worried more that they would not understand. It is also possible that the employer itself finds it more important to have an interpreter present in these situations.

References

[1] Beliková, V., Zelená, H., Babulicová, Z., *Špecifiká integrácie študentov so špecifickýmie edukačními potrebami na vysokej škole* In. Grant Journal: peerreviewed scientific journal., Roč. 1, č. 2, s. 7., 2012 ISSN 1805-062X.

[2] Langer, J., *Komunikace osob se sluchovým postižením*, Olomouc, UPOL, 2013, s. 8. ISBN 978-80-244-3674-6.

[3] Langer, J., Speciální pedagogika osob se sluchovým postižením In. Valenta, M., Přehled speciální pedagogiky, rámcové kompendium oboru, Praha, Portál, 2014, s. 66. ISBN 978-80-262-0602-6.

[4]http://www.cztn.cz/index.php?option=com_content&vi ew=article&id=101&Itemid=75

[5] Tomšík, P., Duda, J. *Řízení lidských zdrojů*, Brno, Mendelova Univerzita v Brně, 2011, s. 85. ISBN 978-80-7375-556-0.

[6] Hroník, F., *Jak se nespálit podruhé. Strategie a praxe výběrového řízení*, Brno, MotivPress, 2007, s. 104. ISBN 978-80-254-0698-4.

SPONTANEOUS ARTISTIC EXPRESSION AS A UNIQUE WAY OF SELF-EXPRESSION

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Abstract: The thesis is focused on drawing peculiarities of individuals from Youth Detention Centres (YDC). The individual's spontaneous drawing expression has become the centre of attention. Spontaneous art expression is considered to be another possible natural way of human expression. The author of this text would like to show that there exists a connection between drawn symbols of juvenile delinquents (JDs) and sketches and drawings of known artists of the 20th century. The author intentionally selected artifacts of JDs to compare those with the sketches of famous artists. Further she examines the artistic expression that accompanies the spontaneous individual's expression. The meaning of spontaneous expression is about the present moment, which is being experienced by the creator. Therefore the author seeks the answer to the question, what the JD is experiencing during the process of his artistic formation.

Keywords: symbols, drawing symbols, drawn expression, art of the 20th century, delinquency

1. Spontaneous artistic expression of delinquents and artists of the 20th century

This chapter focuses on spontaneous artistic expression of the delinquents. By 'spontaneous artistic expression' we mean a creative activity that is not directly or intentionally encouraged or stimulated by another person. It is about an impulse which arises from the internal needs of a person who decides to creatively and artisticaly respond to external and internal stimulus. According to Roesell [1] a spontaneous expression is related to the artist's relationship to reality and that is why this artistic form does not require a true presentation nor to respect proportions nor precision regarding details, it is about expressing the artist's essence. This is also about being able to reach one's deep feelings and experiences. At this moment, the artist authentically devotes himself into his own perceptions and the art form. A spontaneous creation is about the artist focusing primarily on capturing his current mental state, impressions, feelings and moods, thoughts or his attitudes. The artist is mainly focused on what he is experiencing while drawing his creation. This is an experience which expresses his current state of mind. I can declare that a spontaneous artistic expression allows his creators to further develop his personality. Through this authentic expression the creator reveals himself, opens up to the world and most of all gets to know himself. This unique creative process even enables the artist to express his symbolism.

1.1 Drawings of juvenilie delinquents from Younth Detention Centres and of artists of the 20th century

Many artists who I am going to mention tried to express individualy and freely by sketching or painting on canvas their visions, desires, thinking and emotions. They were also inspired by primitive art, some even imitated creations of children or of the mentally ill. Modernists understood this creative process as being really distinctive, impudent and that this revealed the unconscious. The artists's works did not correspond to reality. However, the formation corresponded to what had been happening inside the artists's minds. The artists let themseves be intentionally influenced by the spontaneous expressions of children, primitives, retarded individuals, lunatics and prisoners. The artists saw these people as being creative who were unrestrained by civilization. Paul Klee and Jean Dubuffet were modernists who were most devoted to the artistic expressions of the mentally ill. JDs from YDCs are not mentally ill, however are different from ordinary young children. According to one detention officer JDs are "emotionally handicapped". They experience internal conflicts, conflicts with their loved ones or with their surrounding. They are rebellious, they feel under pressure and are frustrated. Many of them already at their age have gone through so many experiences and have so much life experience, that an adult could be astonished by this. In my opinion their experiences then express their distinctive and impulsive incentives in their self-expression, thus it is helpful to them to express their personality through art activities. The drawings of troubled individuals show features of Art brut, abstract expressionism yet also decorative Art Nouveau.

1.2 Communication through drawing of juvenile delinquents and their artistic handwriting

A drawing process inherently belongs to the activity that shows the perception of the world and the person himself. Studying these drawings we can find out what kind of a life the artist lives and what kind of an inner life he has. Some artists show their talent in capturing details while drawing, they also captured rhythm, repeated lines and used principles of the method called Zentagle (Zentagle, also called "the complexities of lines" is a specific way of drawing based on the automatic creation of the artist. Basically it is about doodling, sketching of shapes and searching for new shapes. Zentagle reflects symbols, different patterns, structures and mainly the artist's attitude to the drawing. The method is a simple way to relax. This method applies meditation which causes soothing effects on the artist). I chose a sample drawing of a JD where I can see the sameness to a sketch by Gustav

Klimt (1862-1918). The boy drew ornamental tree bark in the same way as Klimt caught the decorativeness of kimonos (see Fig. 1).



Figure 1: Details of the kimono sketch by G. Klimt ("Standing woman in kimono", 1917, 50.2cm x 32.4 cm, MoMA) in comparison with tree bark detail of the boy's drawing

I can also find this similarity in a sketch by Pablo Picasso (1881-1973). In this quick sketch he tried to capture farm environment. This picture intrigues me by its simplicity in expression which is similar to the following drawing. A JD tried to create in a rapid pace his ideal house, the surrounding and the atmosphere (see Fig. 2).



Figure 2: Details of Picasso's sketch ("Harvesters", 1910, 31cm x 49cm, MoMA) and details of the JD's drawing

A remarkable drawing for me is a drawing from a juvenile who showed through this process his considerable embarrassment and sadness due to his break-up. He drew his unfortunate love. The portrait of his former girlfriend gives one a feeling of a depressive impression and it is almost frightening. I found similar drawings by the artists Joseph Beuys (1921-1986) and Alberto Giacometti (1901-1966). In their drawings both artists placed emphasis on a portrait and expressively accentuated their emotional states. Beuys blackened his portrait by lines, and this similar drawing process can be seen by the JD. The juvenile did not blacken the portrait of his girlfriend, however smeared black lines around the girl's head, as if by this the juvenile tried to portray isolation and inaccessibility. Whereas Beuys's sketched portrait was also "framed" as the juvenile's, Giacometti's portrait was smeared all over (see Fig. 3). Another similar symbol in Beuys's portrait and the juvenile's portrait are the eyes. Not

one artist drew pupils in the eyes. Three sketches then proof that the artists while drawing had to be absorbed in their negative feelings, maybe even rage, anger and depression.



Figure 3: Beuys's drawing ("Untitled", 1974, 21.6 cm x 13.7 cm, MoMA), Giacometti's drawing ("Untitled", 1951, 65.4 cm x 3 cm, MoMA) and the detail of the drawing depicting the breakup with a girl

Klee (1879-1940) created fanciful systems, where the forms of writing and drawings were combined. In his work, as well as the JDs, Klee made the eyes much bigger and the heads of the figures as well or he introduced other elements into the ornamental designs. In his works, I found a certain type of graphic design process - drypoint etching. In this graphic design by using the linear technique he illustrated the systematic nature of buildings in a city and experimented with perspectives. To this graphic design, I deliberately chose a drawing that is not drawn in the right proportions however is identical to the artist's simple presentation (see Fig. 4).



Figure 4: Detail of Klee's grafic ("View of Ancient City", 1927, 43.5 cm x 63.2cm, MoMA) and a detail of the JD's drawing called "My Garage"

Most drawings that were created by JD, an individual with behavioural disorder or a person prone to aggression, show the signs of Art brut. It is no wonder that these individuals express themselves through this artistic style since Art brut expresses coarseness and brutality as opposed to cultivation. At the exhibition Compagnie de Brut l'art in Paris yr., 1948, which was made up of 2,000 art works from 63 artists of various disabilities, Dubuffet (1901-

1985) wrote his best known text on the subject: "Art brut is preferred above to cultural art ", where brut the artist is put into the role of radical version of the romantic genius freed from all conventions [2]. By this statement he meant the works of people who are not affected by the art culture. Dubuffet admired these artists, especially their unbinding creative process and the indomitable strength of the resulting artifacts. According to him, these artists were not influenced and did not follow the concept of classical or modern art. While looking at their works, the viewer becomes a witness of absolute work of art where he may discover through the artist's inner motivation some kind of a unique and original artistic expression. Dubuffet himself was influenced by a harsh, uninhibited style and his works show farcical, satirical and absurd expressions [3]. A drawing from Dubuffet's sketchbook shows fairy-tail stylized character similar to the fantasy drawing of the JD. In his drawing the character potrays a witch as being one of the detention officers (see Fig. 5).



Figure 5: Drawing from Dubuffet's sketchbook ("El Golea II.", 1948, 30 cm x 12.7 cm, MoMA) and the detail of a fairy-tale character portrayed by the JD

In one of the JD's drawings of the Sun I found how he interestingly captures female lips. These lips remind me of a sketch by William de Kooning (1904-1997). In his sketches Kooning depicts a naked woman, her emphasised lips are the same as the lips in the JD's drawing (see Fig. 6).



Figure 6: Detail of Kooning's sketch ("Untitled", 1966, 25.4cm x 3cm, MoMA) and detail of drawing of the revived Sun by the JD

Spontaneous drawing expressions are evident by the artist Cy Twombly (1928-2011). The principles of his creative process are the complexity of lines, lines themselves, scribbles and composition of letters. His theme usually and deliberately expresses something inexplicable, unclear and confusing. Most JDs express themselves in a drawn form by using this style (see Fig. 7). Doodling evoked calming effects and this became a form of relaxation for them.



Figure 7: Cy Twombly ("Untitled", 1955, 62cm x 91.7cm, MoMA) and detail of an expressive artwork of a tree from a JD from a YDC

Joseph Beuys (1921-1986) and Jean Michel Basquiat's (1960-1988) animated style appeared in most of the JDs' drawings. A game or mere deformation of geometric shapes in Beuys's sketch recalls a representation of a puzzle. Shapes were distorted in a similar way by the JDs while drawing a fence. The strokes are sharp and pointed (see Fig. 8).



Figure 8: Beuys's sketch ("Untitled", 1956, 14.6cm x 10.2cm, MoMA) and details of fences drawn by the boys from a YDC

Another spontaneous drawing by Beuys shows just doodling around on the surface of a sheet of paper. I found conformity of strokes in one of the boy's drawings, who also doodled around on a sheet of paper (see Fig. 9).



Figure 9: Spontaneous drawing by Beuys ("Untitled", 1957, 17.4cm x 27cm, MoMA) and detail of the boy's drawing

Basquiat's works of art are the closest ones to which the problematic individuals are able to identify with . His works include scenes from the hip-hop culture, his bohemian lifestyle and the city environment. He often incorporated script, different codes and symbols in his works. He came to terms with reality through his unique artistic expression. Boys from YDCs refused to draw a figure because of their fear of being diagnosed, therefore some drew characters in a simple short-cut way. This simple and quick way to draw was used by Basquiat (see Fig. 10).



Figure 10: Detail of a figure by Basquiat ("Untitled", 1981, 101.6cm x 152.4cm, MoMA) and detail of characters from the JDs

The last sample drawing by Basquita simply shows symbols which he described verbally in a written form. One JD drew most important things from his life and was also able to portray his wishes. Then, in a similar way as Basquit, the boy wrote down what the symbols mean (see Fig. 11).



Figure 11: A drawing by Basquiat ("Untitled", 1982, 41cm x 35cm, private collection) and detail of the drawing by the JD

2. Conclusions

Each person has a unique and distinctive "handwriting". A common pencil and paper were the agents used for research due to the fact that these agents offer many opportunities to capture the artist's mood. Symbolic images in the drawings show us some kind of communication, the artist talks to us through these. It depends on us how we "read" these symbolic or graphic images. The thesis points out the characteristic features of the JDs' drawings and of some selected artists. At first glance, we can be amazed by the rendition of the drawings that use unusual shapes, grasping the essence and mental state of the artist and the way of using his leading lines. The artist identifies himself with his drawing and this then becomes very personal to him. The examples clearly express the artists by a specific way of drawing. Their ways are enriched with different peculiarities and originalities. The drawings of the JDs and the drawings of the artists have in common the fact that their drawings reflect their unconscious tendencies and life experiences. I evaluate their drawn expression as being the result of the internal and external forces and motives. If we want to understand the artist's creative expression, we must empathize with his work. Within the drawing process of the JDs, tendency to decorativness and regularity appeared, but also their fear to draw the human figure. The drawings reflect deformations of elements, sharp strokes, shading yet also the dynamic and joy from the drawing process. The drawings of the JDs feature Art brut, abstract expressionism and elements of Art Nouveau, as the artists, as well as the JDs, all tried to capture their current state of mind. By means of drawing they responded to their wishes, thoughts and the current situation in which they find themselves. JDs' drawings included fantasy symbols, writing, letters and ornaments. Most artistic styles used by the young were from Joseph Beuys and Jean Michel Basquiat, probably becaise this art style is idiosyncratic, unique, playful and simply the easiest one for the juveniles.

References

[1] Roesell, Vera, *Didactics of Art Education*, Charles Univerzity, Prague, 2003, p. 200.

[2] Foster, Hal, Art since 1900, Slovart Press, Prague, 2007, p. 704.

[3] Dempsey, Amy, *Styles, Schools and Movements: The Essential Encyclopaedic Guide to Modern Art*, Slovart Press, Prague, 2002, p. 304.

INFORMATION TECHNOLOGY IN THE EDUCATION OF MEDICAL DISCIPLINES

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Abstract: The article focuses on new ICT trends and their usage in the education of medical disciplines as a tool useful for more efficient education process and as a complement of contact teaching. Within this topic it focuses on use of the e-learning and digital teaching materials potential as complex tools, which bring dynamics and efficiency to the high school, higher professional school and university education system.

Keywords: ICT, e-learning, online education, digital teaching material, Moodle

1. Introduction

For the majority target of ICT existence can be considered creation of information, information retrieval, processing, keeping, sorting and transfer. Contemporary society is characterized as multimedia society. This is so regarding the fact that with the further technology portfolio development and in relation to the development of the knowledge economy in the context of a globalized society (in its physical or virtual form) more than one media is increasingly used for information transfer. Multimedia bring dynamic to a number of areas from business activities, individual or career development to formal education process.

Nowadays education model based on teacher's interpretation and explanation is overcome, at least there are combinations of contact learning and practical demonstrations, formal and non-formal education linking or combination of managed education in the form of lecture and its electronic support. Traditional model of so-called "memory learning" has been suppressed and technologies are becoming one of the basic pedagogical pillar.

2 Importance of ICT in education

Formal education system consists of three different forms of learning: daily study (student is present in class), combined study (student is present in class according schedule, which is prepared in advance) and distance study (principles of study are self-study and preparation at home). As a part of combined and distance study elearning and digital education materials started to be used and effective tools, which eliminate or reduce physical distance between a teacher and a student. Multimedia use a wide range of an available communication tools, which help to present a subject matter. Sometimes the term "distributed learning" is used in this case. Computers and multimedia are generally used more often in daily study scheme as well. The main argument is that they support visual learning style, retention of information, studies in real time, testing in real time and individualization of student's time schedule as well as individualization of student's learning strategy. (1)

The rapid development of information and communication technologies is the development driving force in all areas including medical disciplines. It is increasingly aimed to streamline provision of health services and to increase quality of health care. In Europe it is discussed about eHealth, which is set of tools and services using ICT to reach an improvement of prevention, diagnosis, treatment, monitoring and management in healthcare. eHealth allows better public access to healthcare, its higher quality and higher efficiency. Among others it involves the possibility of information sharing between patients (as recipients of health care) and providers of healthcare (such as hospitals, medical staff). eHealth integrates health information networks, electronic medical records, telemedicine services, portable devices for monitoring patients, schedules creating software etc. (2) Information technologies are an integral part of everyday working life of medical staff. It has been found as effective to use ICT tools as a part of medical students' preparation for their future job as well. It brings not just studies effectiveness, but its individualization as well. Students will make themselves ready for future everyday practice of ICT usage as a part of their future job.

It is possible to expect future ICT role will be still significant. There are three main EU targets in eHealth field: health of citizens, the quality of health care improving and effectiveness of e-health tools, user comfort and usage. At the same time, the European Union also seeks to make eHealth an integral part of policy area in terms of connected coordination of political, financial a technical strategies by all EU members. For activities such as planning, development and process realization in order to achieve effectiveness of e-health tools and their usage, medical staff and patients as recipients of healthcare will be involved as well. (2)

2.1. E-learning method in the education of medical disciplines

One of the possible uses of information technology in the education of medical disciplines is e-learning. It is not easy to find one general definition of e-learning, because it can be considered from different point of views. E-learning is on the one hand considered as a system, on the other hand as a process, tool or information source. According Elliott Masie, who is considered as a founder of American elearning industry, e-learning can be defined as a tool using network technology to create, distribute, select, administrate and update education materials. (3) From another point of view e-learning can be seen as an education based on electronic media using elements of interactivity. Is can be said e-learning is a combination of education services and ICT, which brings valuable and motivating learning environment to students and it is available when it is needed. (2)

In practice e-learning is quite often combined with traditional contact education, because student learning takes place during lessons at school, but outside school (it does not matter if it is at home or other place such as library) as well. This combination is called as blended learning considered as a sort of hybrid mixed education. The aim is to exploit the potential synergy of resources used as a part of traditional education and potential of electronic resources and tools. (4)

Online education is not bound to a particular profession or field of study and it is not possible to define universally valid positive and negative aspects of e-learning. These aspects should be considered within context (suitability for the study course or learning goals). It might appear elearning is not suitable tool in the education of medical disciplines, because contact with teacher is missing. But teacher is in this case substituted by tutor, whose role is very important. Tutor is not a teacher in methodological guidance of teaching terms. While the teacher lectures, in e-learning environment student studies separately according his/her needs and time options. Tutor is the subject, who helps to student, gives advices, leads and motivates and finally grades student. The great advantage of this method of education is a flexibility not only for a student, who is able to better schedule learning activities in accordance with the basic principles of time management, but for teachers as well, because they are able to operatively update the course information. At least basic experience with information technology is always needed from the site of students, who are planning to study online. In the Czech Republic the education in medical disciplines is now not a new. For example National Center for Nursing and Non-medical Health Disciplines in Brno implemented project "E-learning in lifelong education of health professions" in 2010 - 2013. The main goal was to improve and expand the range of further education for non-medical workers. Another project was implemented by Chamber of Emergency Medical Services in the Czech Republic called "E-learning for paramedics".

As the main advantages of using e-learning in education can be considered possibility to study with regard to the individual needs of the student, decrease in travel costs (reduction of need to travel to college) and possibility to choose education material, which matches with students' level of knowledge and student' interest. Students can study at their own pace, they are flexible without dependence on time, they can discuss with tutor, develop knowledge and skills in connection with the use of the Internet and work with ICT in the context of development of competencies necessary for future career. But there are some disadvantages of online learning as well. The regular structure is missing in online learning and it can lead to sense of isolation from the tutor and students. Problem can be possible tutor unavailability, frustration in case of slow internet connection when is student connecting to learning materials or there can be inefficiency in case student has the lack of basic computer skills.

It is evident that while the benefits of e-learning in education can be considered as universally applicable aspects, disadvantages are mainly very individual and seen as possible risks or threats.(3)

2.2 Case study

In the University of West Bohemia in Pilsen e-learning course for "Specialization in Medical Disciplines" study program was prepared and verified on the level of pilot operation. Prepared e-learning course focuses on study course "Paramedic". E-learning course reflect the selected curriculum processed within theoretical modules. Emphasis was put on learning the basic concepts and nursing procedures. Regarding study course specifics the course did not contain exercises, because there is a reasonable assumption of practical examples and exercises need as a part of traditional contact education. Practical education is usually held at workplaces of medical and emergency care, inpatient health care facilities and other workplaces of integrated rescue system. And there is an argument why e-learning should be used as a complement of practical education, because practical experience gained at above mentioned workplaces cannot be mediated by online learning.

Created study texts contain both static and dynamic elements, main part was static elements with possibility to communicate with tutor. This communication is needed regarding specific field of study, because in many cases it is necessary to consult the issue regarding terminological framework and verification of text correct understanding. And it is the possibility to communicate with tutor and send him/her questions online, which eliminates the main e-learning shortcomings for which it is criticized in terms of an interpretation inadequacy in comparison with contact teaching.

Moodle (Modular Object-Oriented Dynamic Learning Environment), which allows to reflect educational content from the side of student was chosen as a system for elearning course preparation. The advantage of this system is seen in the aim to modify the role of teacher as presenter, who become moderator in e-learning course. This moderator uses discussion and deliberate choice of appropriate activities for student activation and regulation of their activities and is able to lead students by chosen activities to reach of educational goals. (5)

After testing e-learning course as a part of education in winter semester in academic year 2013/2014 a survey among students was realized. This survey has stressed the fact students prefer using e-learning as a complement of contact learning much more than its usage as a complete substitute of contact learning. Students cannot imagine full substitution of a contact learning by an e-learning method, but they find e-learning support as very good complement within which students can sufficiently prepare on a theoretical level for practical exercises to which they are physically present. In total 85 % of students find e-learning very beneficial as a complement of standard education.

Figure 1: Usage of e-learning as a complement od contact learning



Next output of survey has shown that usage of e-learning has in addition to the pedagogical impact economic impact as well. Economic impact is discussed in the context of cost savings on the part of students (primary) and increase of their disposable income (secondary) in relation to the distribution of additional study materials through e-learning support and elimination or minimization of necessity to purchase required textbooks and its financing from own resources (in case of students quite limited resources). Students were asked what effect has the implementation of e-learning modules on their disposable income. In total 46 % of students answered their costs were rather decreased, 39 % answered their costs did not change and 15 % realized significant cost reduction. Anyone realized the creation of additional income.

Figure 2: The impact of e-learning to the costs reduction



3. Conclusion

During the last years of Czech education system go through the process of digitization of teaching. It brings implementation of a number of new, interactive and innovative methods and approaches. Information and communication technologies are a significant contribution of improving the efficiency of teaching at schools (it does not matter if it is basic school, secondary school of the university). Across all fields of education (including education in medical disciplines) information and communication technologies bring enormous potential for the development of professional competencies of students. With the expected further development of ICT and their ever more intensive infiltration into normal school practice it is desirable to focus on didactic and methodological aspects of these new approaches. In this way it will be possible to adapt teaching for relevant competency roles across a wide range of specialization.

References

 VANĚK, J. E-learning, jedna z cest k moderním formám vzdělávání. Karviná: Slezská univerzita v Opavě, 2008, 96 s. Studia Oeconomica. ISBN 978-807-2484-713.
 Elektronické zdravotnictví. In: Veřejné zdraví [online]. Evropská komise [cit. 2014-10-03]. Dostupné z: http://ec.europa.eu/health/ehealth/policy/index_cs.htm
 PEJSAR, Zdeněk. Elektronické vzdělávání. Vyd. 1. Ústí nad Labem: Univerzita J.E. Purkyně, 2007, 108 s. ISBN 978-80-7044-968-4.
 ZOUNEK, J., SUDICKÝ, P. E-learning: učení (se) s

[4] ZOUNEK, J., SUDICKY, P. E-learning: uceni (se) s online technologiemi. 1. vyd. Praha: Wolters Kluwer Česká republika, 2012, 226 s. ISBN 978-80-7357-903-6.

[5] DRLÍK, Martin. Moodle: kompletní průvodce tvorbou a správou elektronických kurzů. 1. vyd. Brno: Computer Press, 2013, 344 s. Studia Oeconomica. ISBN 978-80-251-3759-8.

CONTENT ANALYSIS OF LYING

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Abstract: The work is intended to identify the most frequent contents of lying and summarize the motives that led the interviewed to lying. Study participants were 270 students from the University of Zilina. For the purpose of our research, we modified the questionnaire based on the work of DePaulo [2]. The questionnaire was designed for two groups of respondents - the targets of lying and the actual liars. The contents of lying and the motives for lying were identified from written descriptions of participating students. Based on the results, we classified ten different contents of lying and four respective motives that led people to lying. The analysis of the results along with suggestions for future research are summarized in the conclusion.

Keywords: lying, content of lies, motives of lies

1. Introduction

The work of Vrij et. al [9], Kashy, and DePaulo [2] confirms everyday use of lies, at which people often feel guilty and potentially jeopardize their relationships and good repute. During the research, efforts were made to identify the motives for lying. This research is based on the comprehensive analysis of the motives for lying -Diary Studies of Lying [1]. Her main goal was to map, through the diaries kept by students, frequency of lying and the motives for lying within their day-to-day interactions (lasting at least 10 min.). The results show two lies a day on average, whereas 34% of the interviewed told at least one lie a day. 18% of such lies were detected. Lying most often occurred in partnerships of couples in non-marital relationships. According to the author, this might be caused by people's concerns about losing their partner due to insufficient attractiveness as a potential reason. Therefore, they use lying as a means of "embellishing themselves" [1].

The second most common lie was directed to the parents of students (nearly half of interactions) with the main areas of deception related to smoking and alcohol use (students deliberately lied in order to save their parents from worries).

In regard to motives, the most frequent lies were motivated mainly by gaining personal advantage followed by lying due to psychological reasons [1]. In the professional environment, Sim identified the motive of gain, which was more frequently used by American employees than Israeli employees [8]. It is interesting that it is the socially oriented lying that is more acceptable than the sole liaroriented lying regardless of cultural background. However, it must be stressed that perception of lying and its motive is also influenced by a situation in which lying occurs. Robinson, Shepherd, and Heywood [10] confirm this statement in their work, in which they had interviewed university students and identified how they behave in job interviews. 83% of the students would lie in order to become employed. They claimed that it is guite unpleasant to lie to a friend, however, they are not reluctant to deceive

the potential employer. The participants are convinced that employers themselves do not present fair information regarding employee requirements and often exaggerate to improve the reputation of the company. This example depicts the motive of self-gain.

2. Basic motives of serious lies

Inspired by DePaulo [1], Vrij [9] attempted to identify in detail the set of lying motives based on the so-far performed studies. In the monograph [11], he presents the results of Rowatt Cunningham's study, in which 90% of the interviewed students were willing to lie on their first date [7]. Vrij attempted to summarize the main reasons of lying in the following categories:

1. Effort to make a positive impression on others and avoid embarrassment and disapproval (a woman claims to her boyfriend that another man admires her to emphasize her attractiveness);

2. Effort oriented at self-gain (people deliberately exaggerate their previous salary during a job interview in order to ensure a higher salary in a new job);

3. Effort to avoid punishment (a child lies about who ate the chocolate to avoid punished);

4. Effort oriented at the gain of other people (a pupil apologizes his/her school mate claiming that s/he is sick although s/he plays truant) [9].

Another group of motives mentioned by Vrij are "social lies". In principle, people lie for the purpose of maintaining their social relationships. Interpersonal relationships could seem rude and even socially unacceptable without the so-called "white" lies. To ensure a good work environment, it is more appropriate to excuse yourself from lunch due to work duties as oppose to openly admit to your colleagues that they are annoying you. Social lies represent gain for the liar as well as the target. For example, a liar may be pleased that s/he comforted another person or that s/he, through lying, avoided an unpleasant discussion [9]. DePaulo [2] continued with her attempt to identify motives of the so-called serious lies. Through the analysis of answers, DePaulo identified seven basic motives of serious lies:

- Entitlement (the liar feels entitled to behave in certain manners although it is not accepted by public; so s/he lies);
- Avoidance of punishment or blame;
- Instrumental lying (lying for self-gain or personal advantage);
- Identity and self presentation (lying to make a false impression of identity, experience);
- Protection of self (protecting due to psychological reasons, to avoid confrontation, embarrassment, and conflict);
- Hurting others (lying to intentionally hurt other people);
- Protecting others (protect others from being hurt or from stressful information).

Seiter, Bruschke, and Bai point out many types of motives for lying without a generally accepted typology [5]. In the recent publications [6], [3], [4], dealing with relation between personal characteristics and lying motives, the authors draw from McLeod's and Genereux's typology of motives [5]:

- 1. Altruistic lies (to help or protect others);
- 2. Conflict avoidance lies;

3. Social acceptance lies (to fit in or to be liked by others, give compliments);

4. Self-gain lies;

Certain similarities with the above-mentioned motives can be observed in Vrij's [9] and DePaulo's [2] typology. They all describe altruistic lies (protecting others - [2]; effort oriented at the gain of others - [9]. However, the psychological motive protection from of e.g. embarrassment, which is also described by DePaulo [2]. does not occur in this typology. In our opinion, Vrij's motive [9] "punishment avoidance lies" can be classified as "self-gain lies" [5] - a person avoids punishment and gains something. In our work, we attempted to identify the most frequent contents of lies and classify the motives that led the respondents to deception. We also focused on emotions experienced after the detection of deception.

3. Methods

Study participants were 270 students from the University of Zilina. 150 of the participants were asked to describe a lie told to them (the target's perspective), and 120 students were asked to describe a lie that they have told (the liar's perspective). From the first group of students, 108 participants provided complete and valid answers/stories (8 men, 100 women); from the second group of students, 87 participants provided complete and valid answers/stories (6 men, 81 women). The average age of participants was $22 \pm 1,5$ (SD) between 18-35 years.

4. Procedure – questionnaires

Some sections of the questionnaire were based on the work of DePaulo [2]. We focused on several areas of lying (the motives, content, and emotional reactions to lying). The reactions of targets to lying were formed based on five basic emotions (fear, anger, enjoyment, sadness, disgust). Ratings of emotional reactions were obtained from a 9point scale ranging from 1 (not at all) to 9 (very much). On the same scale, liars indicated the degree of experienced emotions. Moreover, the participants described the characteristics of people to whom they told the lie or who told the lie to them, including gender and the type of a relationship (three categories of closeness: 1. casual – strangers and acquaintances; 2. semi-close - friends other than best friends; 3. close – parents, romantic partners). The motives and the content of lies were identified from handwritten stories.

The content of lies and the motives for lying were identified based on written descriptions of the participants. Definitions and examples are shown in Table 1. For the purpose of impartiality, the results were evaluated by two researches. Reliabilities (kappas) were, 94 – contents, 83 – motives.

5.Results

First, we analyzed the content of lies based on the target's perspective and the liar's perspective. The participants described lies involving personal facts, identity, deathillness, addiction, misdeeds, forbidden socializing, affairs, damage to the property, money, school environment and location (Table 1).

 Table 1 Definitions and examples of the content of lying

 (targets, liars)

Content	Examples
Personal facts, Feelings	My close friend lied to me about his singlehood. In fact, he had a girlfriend and even a child.
Identity	One man lied to me about his life and identity. He pretended to be someone else.
Death, Illness, Injury	My mother did not tell me everything about my father's illness. His condition was much more serious than what she was claiming. She did not want me to be concerned too much about my father.
Addiction	My sister lied to me about her alcohol addiction. She might have been afraid of my negative reaction.
Misdeeds	Recently, I bought a mobile phone in a second-hand shop. After 2 days, the mobile phone started acting up. It seemed to have a software virus. I suspected that it might had been stolen. However, when I returned back, the store was no longer there. I had neither money nor a functioning phone.
Forbidden socializing	My partner lied to me saying that he had not been out with his friends. After chatting with our common friends, I found out that my partner had been at a party with our friends.
Affairs and other romantic cheating	My boyfriend lied to me about cheating on me. He kept telling me different stories. He finally told me the truth half a year after our break up. We made up and stayed friends.
Damage to the property	My mother had accidently broken a pot with my flower, but she did not admit it to me. When I became upset about the incident, she eventually admitted her guilt.
Money, Job	I lied about the practices of the company that

	employed me (part-time job).
School environment	I lied to my classmate about the test results.
Location	When I was junger, I lied to my parents about where I stayed overnight. I claimed that I stayed at my classmate's house, but actually I stayed at my boyfriend's.

The contents of the lies were different for liars and targets $\chi^2(11, N=195)=53,58$; p<0,05.This interaction was significant for the liars and for the targets of lying. The most commonly used lie, 25% (27 out of 108) for the targets of the lies, represented personal facts and feelings. 18,5% (20 out of 108) of the lies involved school environment. Lying about location was not described by any participant.

In case of liars, the most frequently described lies involved school environmnet - 19,14% (22 out of 87) - and money - 16,1% (14 out of 87). Lies about identity and misdeeds have not occurred (Table 2).

 Table 2 Frequencies of content category target perspective

 - the liar's perspective

	Targets	Liars
Content category	Frequency	Frequency
1. Personal facts,	27 (25)*	12 (13,8)
feelings		
2. Identity	4 (3,7)	0
3.Death, Illness,	4 (3,7)	5 (5,7)
Injury		
4.Addiction	11 (10,2)	4 (4,6)
5.Misdeeds	8 (7,4)	0
6.Forbidden	13 (12)	13(14,9)
socializing		
7.Affairs and other	11 (10,2)	3 (3,4)
romantic cheating		
8.Damage to the	2 (1,9)	2 (2,3)
property		
9.Money, Job	8 (7,4)	14 (16,1)
10.School	20 (18,5)	22 (19,14)
environment		
11.Location	0	12 (13,8)
Total	108 (100)	87 (100)

* Percentages are marked in parentheses

In our work, we have identified four motives for deception: avoidance of punishment or blame, instrumental lying, protecting others (Table 3). These are consistent with the findings of DePaulo [2]. As a new motive appeared experimental motive - using deception out of curiosity. This type of motive occurred in 7 cases out of 87.

Table 3 Identified motives

Motives	Frequency
Avoidance of punishment	20
Instrumental lying	49
Protecting others	11
Experimental lying	7
Total	87

In our study, we also explored the emotional reactions after detecting lies. The results have shown that targets

reacted most frequently with anger M=6,16 (mean) but also with sadness M=5,21 (Table 4).

Table 4 Experienced emotions

Emotions - Mean	Liars	Targets
fear	5	0
anger	2,11	2,19
enjoyment	1,89	1,43
sadness	4,68	5,21
disgust	2,05	4,69

6. Conclusions

The results of our study confirm the findings of previous work [2], [5], and indicate that the content of lying in everyday life does not differ on a large scale. DePaulo [2] identified seven contents of lying. In our work, we have identified new contents related to school environment, location, damage to the property, and addiction. In regard to motives for deception, we have identified a new motive - experimental lying - respondents told the lie out of curiosity. Considering high reliability of the questionnaire and the results of our work, we would recommend exploring the results in a more extensive and heterogeneous research. For the subsequent work, we suggest to address the areas of emotions experienced during the unveiling of lies since the exprienced emotions are closely related to a better understanding of lying.

References

[1] DEPAULO, B.M, KASHY, D.A. Everyday lies in close and casual relationships. Journal of Personality and Social Psychology, 74, pp. 63-79, 1998

[2] DEPAULO, B.M, ANSFIELD, M.E., KIRKENDOL, S.E., BODEN, J., M. Seious Lies. In basic and applied social psychology, 26 (23), pp. 147 – 167, 2004

[3]GIAMMARCO, E.A., ATKINSON, B., BAUGHMAN, H.M., VESELKA, L., VERDON P.A The relation between antisocial personality and the perceived ability to deceive. In Personality nad individual Differences 54, pp. 246-250, 2013

[4] KONEČNÝ, Š. Lying on the Internet. Thesis, Masaryk

University, 2010

[5] MCLEOD, B.A, GENEREUX, R.L. Predicting the acceptability and likelihooh of lying: The interaction of personalty with typ of lie. Personalty and individual differences 45, pp.591-596, 2008

[6] PHILLIPS,M.C.,S.W. MEEK, VENDEMIA,M.C. Understanding the underlying structure of deceptive behaviors. In Personality and individula Differences 50, pp.783-789, 2011

[7] ROWATT, W. C., CUNNINGHAM, M. R., & DRUEN, P. B. Lying to get a date: The effect of facial physical attractiveness on the willingness to deceive prospective dating partners. Journal of Social and Personal Relationships, 16(2), pp. 209-223, 1999

[8] Sim, R.L. Support for the use of deception within the work environment: A comparison of Israeli and United Stated employee attitudes. Journal of Business Ethics, 35, pp. 27-34, 2002

[9] VRIJ, A. Detecting Lies and Deceit. The Psychology of Lying and the Implications for Proffesional Practice. Chichester England: John Wiley & Sons Ltd, 2000. Pp.254 [10] VICIANOVÁ, M. Meaning of the word lie : Verification of Coleman and Kay study, In Conference: Social processes and personality 2012

[11] VRIJ, A., GOZNA,L.,F., BULL, R. The impact of individual differences on perceptions of lying in everyday life and in a hig stake situation. Personality and individual differences 31, pp. 1203 – 1216, 2001

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SYMBOLISM OF BEADWORK IN TRADITIONAL FOLK DRESS

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Abstract. Beadwork was a part of folk dress decoration in the many regions of Europe. It had been developed in many forms on the territories of Central Europe. Beads embroidery had been appeared among rural areas in the 19th century and disappeared together with folk culture and folk dress. As a young type of decoration it absorbed elder traditions and introduces new influences. This research is devoted to one of the interesting phenomenon of beadwork in folk dress, namely to its symbols and functions. The article describes symbols and functions of beadwork in the last period of development of traditional culture.

Key words: beads, beadwork, folk dress, traditional culture.

1. Introduction

This study is based on the artifacts of traditional dress from ethnological collections of the largest museums in Czech Republic, Slovakia and Ukraine. Territorial borders of the investigation were selected due to the present material base. The unique forms of handicraft, which appeared in folk culture of these regions, give a rich material for research of beadwork as an example of folk decorative art.

1.2. Time boundaries

The period of the highest development of beads decoration in the national clothes of Central Europe is from second half of the 19th to first half of the 20th centuries. According the artifacts from museum collections it was a time when beads take a wide spreading among the rural areas. Some researchers suppose that beads can be present in folk dress during earlier periods [1, 2]. However, today we have no material or documental evidences for support of this hypothesis.

This time was a period of flowering of beadwork in the national traditional clothes of many regions of Czech Republic, Slovakia and Ukraine. On the other hand it is a period of decay of folk cultures before its disappearance. Nevertheless, many ancient folk cultural beliefs and superstitions were reflected in beadwork and were maintained across centuries to this period.

2. Symbols and function of beadwork

2.1. Symbols of colors

Beads had been a popular decorative material during 19th and first half of 20th centuries among the rural population as well as the middle class and the nobilities. However, relation to ancient sacral senses and decorative artistic function of beadwork remained almost completely in traditional folk dress.

We can distinguish two levels of beads symbols. It is symbols of colors and symbols of ornaments. At the same time we can talk about the representative function of beads, the esthetic decorative function, the safeguarding function and the healing function. Functional and symbolic roles of beads were closely interconnected in folk dress. Beadwork was a part of festive representative clothes primarily and beadwork in dress demonstrated in this situation social status and richness of family, its position in the society. Despite the decline in prices of beads, it remained expensive material for the majority regions. It is one of the reasons for the spread of color beads in the crowns bride and wedding dresses on the large territories of Central Europe.

Symbolism of colors of beads had ancient roots. One of the most popular girls and young women jewelries in the folk areas were necklaces made from red beads with one or more levels (Figure 1). These necklaces were ones of the most desirable accessories. Besides esthetical function the red color was considered as a magic amulet, which protects against evil forces and able to cure different diseases. Interesting fact, that these beliefs were mostly connected with diseases of the eyes [3].



Figure 1: Necklace from red glass beads. Ukraine, 1890. Ethnological department of the National Museum in Prague, H4-PR3309

Not only red beads had a magic protective function. Some researchers noted that as amulets were also used necklaces with blue and even black beads [4]. These variants appeared for example in some regions of Slovakia and Ukraine, however they obviously was not widespread. A safeguarding function of beads is brightly demonstrated by child christening bonnets (Figure 2). Many exemplars of these bonnets from second part of 19th to beginning of 20th centuries are demonstrated in museum collections. The child christening bonnets from Chodsko (the Czech Republic) present this belief very characteristically. The bonnets from red cloth were decorated by glass beads, bugles, pailettes. The main material of decoration was a red bead, which imitates Czech garnets. Red garnets in the folk beliefs were magic amulets, which protect the owners from misfortune and gives success [5]. However, transparent beads can be also found on the red canvas of bonnets. This visual imitation of beads color might be used for strengthening of their magic function. Nevertheless, the red color was a main sacral element of this part of child's costume.



Figure 2: Christening bonnet with false garnets, Chodsko. Private museum in Postřekov

Red beads as an imitation of Czech garnet were presented in the folk costumes of some regions as a general material of decoration. These are traditional Chodsko's festive woman vests where whole surface of vest was decorated by false garnets. It had not a symbolic value in strong senses, but it is a demonstration of representative function of beadwork (Figure 3).



Figure 3: Women's festive vest, Chodsko. Museum of Chodsko in Domažlice, E 2. 546.

In some regions beadwork decorated often belts or headwear only. There were sacral parts of clothes on the one hand; on the other hand these elements were mostly important in dress ensemble. Its decoration demonstrated a social status and richness of owner and his family. That's why beads, as a precious material, often appeared on these parts of costume. Furthermore, belts and headwear in the women's costumes especially were amulets in the meaning of people. Beadwork on these parts of costume had protective function also.

Beads had similar value in the bridal crowns. It was the most common part of festive costume which was decorated by glass beads, imitation of pearls, garnets and corral. Tradition of this decoration was spread in the majority regions of Europe and had the same magic sense. Representative and sacral function co-existed in this tradition and complemented each other. A bride is a central person in the wedding ceremony. She is strongly subjected to evil forces according to folk beliefs and needs for protection during ceremonial. All parts of ceremonial dress and rituals are directed to this protection. Bridal crown as the most important symbolic elements of the ceremony had a more function than decoration. Here, beadwork combines esthetical, ritual, protective and representative functions.

Figure 4 shows a bridal crown from Southern Moravia. This is bright example of use of beads in the ceremonial dress. As we can see imitation of pearls with red and blue beads were a basis of decoration. Natural pearls were more precious for folk areas and transparent glass beads were filled with wax or white opaque beads were substituted its. Folk beliefs related with beads had been alive at the 19 and the beginning of 20 centuries in some regions, as Chodsko. In contrast, these superstitions had been forgotten and disappeared in the other locations. However, the beadwork remained the popular form of decoration. Thereby, the beliefs, related with its existed only as rudiments.



Figure 4: Bridal crown, Southern Moravia. Ethnological department of the National Museum in Prague, H4-93822

2.2. Symbols of ornaments

Interesting situation we can see in Blata, other traditional location of Czech. Blata's shawls demonstrate a unique example of reach beadwork. However, colorful beadwork had not symbols of colors, but presented symbolism of ornaments (Figure 5). The South Czech Blata was one of the richest and conservative regions. Most favorable conditions existed here for appearance and development of a new tendency in a folk material culture. On the other hand, Blata was a region with conservative traditions. Beadwork appeared in the Blata costume as a new kind of decoration. However, it accepted old traditions, typical dress forms, compositions, ornaments and symbols.

Traditional folk Blata's ornaments were influenced by Renascence, Baroque and Classicism style. Christian symbols had been combined with more ancient pre-Christian symbolic. Central part of a majority of compositions is a floral baroque bunch. Some variants of this bunch can be also considered as a transformation of the image of the tree of life. This is a popular motive in the folk art. This element of ornamental décor was interpreted in the context of folk tradition as world tree, i.e. old symbol. It is interpreted as an ancient sacral symbol of protection. Images of rose had been often depicted on the Blata's veils and were spread in the folk ornaments related to Solar symbolic. Ornaments with rose garlands and wreathes are also considered in this context. It is related to protection symbols as well. These ornaments had not appeared with beads in the folk dress, but their popularity and adaptation to the new material were high.



Figure 5: Women's shawl, Southern Blata. Hussite Museum in Tábor (Sobeslav), 198 N

3. Conclusions

Beads in the folk costume combined sacral, representative and esthetical functions. The beads were a new material for traditional culture. However, ancient symbolic and beliefs about symbols of color and ornaments had been reflected in the folk beadwork of second half of the 19th to the beginning of 20th centuries. Protective function of these elements had been saved as rudiments of folk beliefs and superstitions in the later period of folk culture development.

The combination of ornaments from different epochs and styles are typical for decoration of folk costumes. Beadwork as a younger type of decoration absorbed traditional ornaments and was adapted to the specificity of ornamental forms, symbols and materials.

The development of beadwork was not uniform in the folk costumes of different locations of the Eastern and Central Europe. Beadwork assimilated older local traditions in these places where folk society was conservative.

Different forms of beadwork decoration were created on the basis of old traditions in the territories with weak interdependence between city and rural culture. In contrast, a new type of beadwork decoration arises in the symbiosis of urban fashion and traditional culture in those locations, where correlations between rural and urban areas were strong. However, symbolic meaning of beads ornaments had been saved.

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References

[1] Федорчук, Олена, Українські прикраси з бісеру, Львів, Свічадо, 2007, С. 17 (Fedorchuk, Olena, Ukrainian beads jewelry, Lviv, Svichado, 2007, Р. 17).

[2] Johnová, Helena, *Šperk*, Bratislava, Tatran, 1986, S. 16-17. (Johnova, Helena, *Jewelry*, Bratislava, Tatran, P. 16-17).

[3] Johnová, Helena, *Ľudové šperky na Slovensku*, Bratislava, Vydav. Sloven. akad. vied, 1972, S. 15. (Jonova, Helena, *Folk Jewelry in Slovakia*, Bratislava, Slovak academy of science, 1972, P. 15)

[4] Johnová, Helena, *Ľudové šperky na Slovensku*, Bratislava, Vydav. Sloven. akad. vied, 1972, S. 15. (Jonova, Helena, *Folk Jewelry in Slovakia*, Bratislava, Slovak academy of science, 1972, P. 72).

[5] Tauberová, Monika, Lidový šperk z Čech, Moravy a Slezska ze sbírek Národního muzea, Praha, Národní muzeum, 2012, S. 58 (Tauberova, Monika, Folk Jewelry from Czech, Moravia and Silesia at the Collection of the National Museum, Prague, National Museum, P. 58).

FIRST INTERNATIONAL ORAVA CONGRESS AND ITS SOCIO-CULTURAL CONSEQUENCES

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Abstract: The article dwells upon the First International Orava Congress which took place between 19-22 July 2012 in Poland. The organizational process of the event started two years before the planned date and plenty of people were involved in the project. The congress as such last four days and was full of social, cultural, music and sport activities. Around 300 Orava highlanders from over twenty countries from all over the world gathered to unit for the first time in history. Various folk dance teams and music bands came from Poland, Slovakia, Hungary and the USA. Youngsters, from the second generation of Orava immigrants, met their peers and since then they have established transatlantic relations. It is believed to be the most important happening in the history of Orava nowadays.

Keywords: migration, Polish Orava, the USA, folklore, regionalism

1. The region of highlanders - Orava

Orava is the region located in the south of Poland and also in the north of Slovakia. The Polish part is inhabited by ca. 28,000 people residing in fourteen small villages [1]. The biggest and the most important villages are: Jabłonka and Lipnica Wielka. In the Orava area the first settlements are dated from the second half of the 16th century. It was thanks to the copper route which started in the 15th century from Banská Bystrica (today in Slovakia) to Mogiła (Poland near Cracow). It contributed to the creation of new villages which were under the Thurzo family jurisdiction – the Hungarian magnates [2].

The Slovak part is bigger compared to the Polish one and is inhabited by ca. 54,000 people. In addition, Orava in Slovakia is called White Orava (the northern part of the region) and the Polish area is named Black Orava. It is because of the names of rivers which have their beginnings in Poland (the Black Orava River) and in Slovakia (the White Orava River).

In the past Orava was the region of interfusion of different religions mainly: Catholicism and Lutheranism but also there were many Jewish people. It resulted in conflicts (especially Catholics vs. Lutherans) but also in the cultural development of the region and the awareness of religious tolerance among locals.

It needs to be pointed out that Orava is the countryside of highlanders – Orava highlanders. There are different groups of highlanders in Poland including Podhale, Spisz, Pieniny, Żywiec highalnders etc. The Orava ones, however not the biggest of all highlander regions, is very interesting to examine. As Motyka points out the region is distinctive in terms of culture, music, clothing as well as the architecture of wooden houses [3].

2. Aims of the First International Orava Congress

There were several aims that the First International Orava Congress was established. The idea of having an event which would gather all Orava people from different parts of the world started two years before the opening date of the Congress. The main organizer was the mayor of the Jabłonka village (it is the biggest Orava commune consisting of villages like: Jabłonka, Orawka, Podwilk, Lipnica Mała, Chyżne, Zubrzyca Dolna and Zubrzyca Górna). The event was co-organized together with mayors of neighbouring villages: Lipnca Wielka (consisting of Orava villages: Kiczory and Lipnica Wielka) Czarny Dunajec (Piekielnik and Podszkle) and Raba Wyżna (Harkabuz, Bukowina Osiedle, Podsarnie). In addition, there were also partners from Slovakia (the mayor of Trstná town) and the USA (the Babia Góra Club affiliated at the Polish Highlanders Alliance of North America). There were seven basic aims thanks to which it was possible to organize such an event:

1. Integration of Oravians those living in Orava and the ones dispersed around the world.

Entrenchment of Orava identity based on deep catholic faith, tradition and allegiance to Orava habits.
 Promotion of Orava as a land of rich tradition, culture and history.

4. Belief that Orava can connect and not disconnect.5. Creation an image of Orava as an interesting, beautiful and attractive for tourists place.

6. Attracting emigrational societies to Orava. 7. Showing Orava as a borderland where there was an amalgamation of different ethnic groups, a tolerant region, open to others as it is signed in the motto of the European Union "Unity in Diversity" [4].

3. The proceedings of the First International Orava Congress

The Congress last four days. The opening was held at 3.20 o'clock on Thursday, the 19th July 2012. Next to the district (village) office in Jabłonka the colourful parade set off in the direction to the local church. In the procession there were flags of twenty countries from which migrants arrived in Orava. The highlanders came from the following countries: Australia, Austria, Brazil, Canada, Czech Republic, Denmark, England, Germany, Hungary, Ireland, Italy, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, the United States of America.

There were also all Orava educational institutions including primary school and secondary school as well as associations which are based in the region of Orava. Most people were wearing their traditional and highlander clothes. The interesting fact was that many adolescents put on woollen trousers and cotton blouses. It can be said that the regional tradition is still vivid and young people are not ashamed that they come from this region of Poland.

At 4 o'clock the mass started in the Transfiguration of Jesus Church in Jabłonka. It was celebrated by the bishop Jan Szkodoń – the first and the only one Orava bishop. During the mass Andrzej Łuka, who is a distinguished worldwide organist and comes from Orava, ennobled the whole celebration.

Having finished the praying in the church all the participants marched to the new Orava Health Centre (*Orawskie Centrum Zdrowia*) in which the mayor of Jabłonka, Antoni Karlak, officially opened the centre.

The most important moment of the day was the opening of the First International Orava Congress at 7 o'clock. The mayor of Jabłonka together with officials from sistertowns of Jabłonka: Trstná (Slovakia), Tvrdošín (Slovakia), Wolbórz (Poland), and Nagymánok (Hungary) as well as the neighbouring villages uncovered an obelisk which was dedicated to the First International Orava Congress. The block stands in front of the village office in Jabłonka. Placing the objects in the very special place, in the hearth of Orava, it can be considered as very memorable and the event as such was of the great importance for Orava officials and inhabitants.

The event was supported by brass bands from the sistertowns and also instrumental groups from Lipnica Wielka and Jabłonka. What is more, the opening words of the mayor of Jabłonka were significant and will stay long in the participants memory. Antoni Karlak started in these way,

"Dear Participants! Orava has had a difficult and complicated history. This rocky land wanted us – Oravians – self-denial, persistence and solidarity. This obelisk is a symbol of Orava effort, hard work, but also it is a symbol of unity, strength and solidarity which our Orava Land has been taught us for generations. My Dear Oravians living here on the Orava land and those who had to leave the land from various reasons (...). I invite all of you to a common celebration, to our Orava table. I consider the First International Orava Congress as the open one" [8].

The invitation of guests and all Orava inhabitants took place at 8 p.m. in the Orava Cultural Centre (*Orawskie Centrum Kultury*) in Jabłonka. It last for two hours and then there was a music show entitled "What makes me stay with you Orava?" in which all folk music bands from Polish Orava and the USA joined and together were singing and playing traditional Orava melodies and short folk songs.

It can be argued that it was the most touching moment of the FIOC as well as in the history of Orava. There were over three hundred immigrants who joined the event. Some of them came to Poland after several years or even longer. There were moments of thousands tears and unforgettable emotions. Migrants met their peers, colleagues or families in one place at one time. The biggest diaspora group that came to the congress was a representation from the USA. Almost one hundred Orava descendants from Chicago and other parts of the USA graced the region with their presence [5].

It is believed that the greatest number of Orava people exists in the USA nowadays. Oravians in the USA gather in the Polish Highlanders Alliance of North America (ZPPA – Związek Podhalan w Północnej Ameryce). The Alliance consists of 86 units to which all Polish highlander groups can belong. People who came to the First International Orava Congress are associated with the Babia Góra Club – it is the 48^{th} unit of the Polish Highlanders of North America (Babia Góra is the highest mountain in the Beskids region which is a part of the Carpathians). It is said that in the Babia Góra Club there are affiliated around one hundred and fifty members. But in the Chicago conurbation there can be even three thousand Oravians [6] and some claim that the number of people of Orava origins can oscillate between three thousand and five thousand people [7].

3.1. Social and cultural proceedings of the First International Orava Congress

It can be said that the congress not only aimed at rejoicing because of meetings with Orava immigrants after many years, however, it was also very important for the organizers. The second day of the proceedings started in the Orava regional ethnographic museum in Zubrzyca Góra (one of villages in Orava) - Muzem-Orawski Park *Etnograficzny*. There was a workshop on the production of bread and linen which Orava in the past was famous for. Children from partner-towns and locals could have the opportunity to prepare their own loafs of bread and then to consume and share them with other participants. It resulted in making friendship with whom local villagers very often compete in everyday life (mainly during school sport or educational contests). In the past there was a tendency not to keep in touch with neighbouring villages. These days the reality has changed and young generations are acquainted with neighbours and well as with the history and culture of the region which they live in.

In addition, there was a workshop in the Orava Public Library in Jabłonka during which the locals and visitors could have an open access to the archives and materials which the library possess. They also worked on the Orava Dialect Dictionary with its author, Józef Kaś, a distinguished linguist who comes from the region. During the day there was an opening of the First Folk Art Sale in Orava (Pierwszy Kiermasz Sztuki Ludowej na Orawie). There were local products which everyone could taste or admire and then buy. One of the local folk products were oscypek (cheese made from cow and sheep milk) and zawijaniec (a type of sweet roll with cow cheese). The rest of objects were connected with the regional Orava art. Pottery bells were produced by Marian Smereczak and Magdalena Kostrzewa-Smreczak. Wooden toys and wooden sculptures were made by Marcin Lichosyt, Jerzy Fugiel, Aleksander Wegrzyn. Emilia Jasiura, Aniela Dyrda, and Jadwiga Wieciosek are famous for making

from blotting paper flowers. Wooden horn instruments have been made since decades by the Haniaczyk family. Also, there were paintings and drawings of Stanisław Wyrtel (a famous Orava draftsman) Teodor Smutek, Małgorzata Malczewska-Medwecka, Karolina and Antoni Antolak. Making regional jewellery is everything for Elżbieta Kolwlczyk and Maria Spyrka. Partners from the Czech republic presented their works made from metal and pottery. Those from Wolbórz (a sister-town of Jabłonka) specialized at knitting and embroidery of table cloths. Delegates from Slovakia presented their wooden religious figures or saints and angels. While visitors of the First Orava Art Sale were mingling between regional stalls, there were folk dance performances on the stage nearby. The brass instruments band from Wolbórz was playing their local melodies. The most important guest of the event was a folk dance tream "Orawa" from Chicago. They presented original Orava dances and short folk songs. It was a great occasion to see the American youth on the stage who were singing in the Orava dialect. It needs to be stated that most of them were born in the USA and their first language is neither the Orava dialect nor the Polish language but English. In spite of this fact, the children were singing in a very good highlander dialect and did not have problems with the lyrics of songs. Most of the team belongs to the second generation of Orava descendants. Having been acquainted with Orava folk dances and melodies, it can be argued that the performance of Chicago Orava team was of a highly quality. They used all elements in singing and dances which are distinctive for the Orava area. This fact can prove that the culture do not need to be only cultivated in the place of origin (in Orava). It can be performed also in the USA and by children who have not experienced the tradition in Poland, but thanks to their parents and folk dance directors (the folk art director - Elżbieta Kucek, the vice director - Maria Jazowski-Liszka) all Orava indigenous forms are preserved.

The second day was devoted to the cultural history of the Orava region. There was organized a conference "Orava close to the world - the world close to Orava" during which prominent people had a speech on migrations from Orava. Stefan Lopinsky was talking about Polish migrants in Germany, Jan Łaciak, the president of the Babia Góra Club, devoted his speech to problems of the Polish Orava diaspora in Chicago, Andrzej Madeja reconstructed migrations from Orava through centuries, Andrzej Woszczek presented changes in Orava, Antoni Wontorczyk was dwelling upon the process of acculturation, and Krzysztof Staszkiewicz transferred the audience into the media world and was talking about "Wiadomości spod Babiej Góry" ["News from Babia Góra"] the radio programme which is being broadcast since 1998 once a month on the first Sunday of the month at 1.30 to 3.30 the local time. Not only was it important for visiting guests, but also for locals who had a possibility to get to know lots of information about their region.

After the conference there was a meeting called "Time of Reminiscence" in which Oravians who immigrated to different countries shared their memories of the area they had lived before and their neighbours. It was also a moving moment during the whole congress. Some people have not seen each other for years but have had good relations before immigrating abroad. The day ended with the concert of Orava musicians who played the organs (Andrzej Łuka), the clarinet and the piano (Marek and Stefan Nemtusiak), the piano (Anita Steckiewicz) together with the singer (Anna Bugajska), the piano and singing (Mateusz Ziółko, Anna Dudek and Dominika Grzybacz). Also, there was a concert of the Orava folk music band "Arva" who were performing songs with lyrics of one of the greatest Orava poets – Emil Kowlaczyk.

The next day was initiated by the meeting with the American Polish diaspora in the Orava Public Library in Jabłonka together with the Orava bishop - Jan Szkodoń. Later there was a sport contest in which four teams competed. The winner was the Slovak team from Trstná. The afternoon and evening was divided among two communes: Jabłonka and Lipnica Wielka - the Orava villages. In Jabłonka, which is considered to be the capital of Polish Orava [9], there was a concert of a worldwide known Orava singer - Andrzej Dziubek. And at the same time there was a show on the stage outdoor in which bands and regional musicians from Orava, Gorzów Wielkopolski (Poland) and Chicago performed together. Having finished official performances, the *watra* (a highlander bonfire) during which all present people could consume local products, sing regional songs and have fun together. It was important from the strengthening-relations point of view. New friendships were made and adolescents had a chance to talk to their peers and exchange their life stories.

The last day of the First International Orava Congress started from the mass celebration in the oldest Roman Catholic church in Orawka (one of the villages in Orava). In the afternoon there were proceedings of the "Orava Summer" festival in which folk bands were performing and many competitions were held especially dedicated to visitors who had an opportunity to have a glimpse of the Orava culture. There were competitions connected to making butter in a traditional way, cutting the grass by a scythe. One of the most significant moments of the day was the "Shepard Horn" decoration – the prize of the mayor of Jabłonka to a person whose work contributed to the perseverance of the Orava culture. The award unanimously was given to Jan Łaciak – the president of the Babia Góra Club in Chicago.

Furthermore, there was performance of a folk band from Nižna (Slovakia) and a music orchestra from Nagymánok (Hungary). The congress was finished with the concert of Eleni, the famous Polish singer of a Greek origin, who was famous when the last generation of Orava people immigrated to the USA – 1980s and 1990s.

4. Outcomes of the FIOC

The congress finished two years ago but the memory of it still are in mind of organizers, local Orava autochthons and visiting guests and the Orava immigrants. Within the following year of 2013 two books were published on the First International Orava Congress. The first one entilted "*I Światowy Zjazd Orawian na fotografii*"I ["the First International Orava Congress on photographs"] presents a
collection of photos on 192 pages [10]. It illustrates all the events which took place within four days of the congress. It is divided into four parts and the photographs are encrusted with descriptions and comments.

The second publication was *I Światowy Zjazd Orawian*. *Jabłonka, 19-22 lipca 2012 r. Wydarzenia i wspomnienia* ["the First International Orava Congress. Jabłonka, 19-22 July 2012. Happenings and Memories"]. It was published by the mayor of Jabłonka – Antoni Karlak.

The publication is divided into several parts. The first four chapters present and summarize each of four days of the congress. It can be argued that the book is atypical. There are texts of conference papers which were produced during the second day of the event. So it can be treated as a postconference volume. But the work also contains memories and reflections of Oravians living in the USA. There is also a part devoted to Orava highlanders who live in Europe, outside Orava and recollections of sister-town visitors. Moreover, there is the whole correspondence included from the very beginning of the organization of the congress and the list of people who contributed to the proper functioning of the events during the FIOC.

5. Conclusions

The First International Orava Congress brought many changes into various areas. The event was organized for the first time in the history of Orava so that people from the whole world (over twenty countries) gathered in one place at the time. Having spent many years abroad, some of immigrants returned to Orava and met their families, acuaintances, teachers, and peers. It resulted in intensification and strenghtening family ties.

Moreover, young generation from Poland and the USA established new relationships. Some of the second generation children visited Orava for the first time in their life. They were cultivating the Orava culture in America but have never experiened the tradion of their parents or ancestors. It made them more interesting in the Orava highalnders habits.

The happening last only four days, however the preparation started two years before, but the impact is also visible in the local area. The new building, Orava Health Centre, was finished and the there were bulit many allies, sidewalks and roads. It can be said that infrastructure of Orava villages has improved a lot.

Furthermore, folk band teams from Polish Orava started a collaboration with teams from Slovakia, Hungary, but first and foremost the USA. There is a visible transcontinental link. The folk bands keep in touch and it is not out of the question that the teams will rejoin in some festivals either in the USA or Poland.

Also, promoting Orava history and tradition worldwide is another merit of the FIOC. Not only were local regional musicians invited to the congress, but also the ones from different regions of Poland and also from Slovakia and Hungary.

In addition, the two books on the congress are a great means of promoting Orava in an academic world. Also, it can focus the attention on people who deal with migrations, regionalism, transcultural studies or folklore. Without any doubt it can be stated that the FIOC was one of the most important events in Orava since ever. There are plans to organize such events minimum once in five years.

Abbreviations and acronyms

FIOC – First International Orava Congress ZPPA – Związek Podhalan w Północnej Ameryce (Polish Highlanders Alliance of North America).

References

[1] Liszka, Marek, "*Co mnie tak dzier-zy przi tobie Orawo?*" Życie kulturalne Polonii orawskiej w Chicago, Kraków, Jagiellonian University Press, 2013, p. 21.

[2] Trajdos, Taduesz, Pieńkowska, Halina, Kościół w Orawce, Kraków, Secesja, 1999, p. 11.

[3] Motyka, Władysław, *Śpiewnik górali polskich*, Milówka, Beskidzkie Towarzystwo Oświatowe, p. 136.

[4] http://www.zjazdorawian.pl/

[5] Liszka, Marek, *Orava w centrum świata, świat w centrum Orawy*, "Polonia" 2012, vol. 10, nr 10-11, pp. 46-48.

[6] The number of Orava people in Chicago presented Bronisław Janociak in the radio programme "Wiadomości spod Babiej Góry" ["News from Babia Góra], the radio programme nr 33, 03.06.2001.

[7] Liszka, Marek, "Co mnie tak dzier-zy przi tobie Orawo?"..., p. 27.

[8] Liszka, Marek, Orawa w centrum świata..., p. 46.

[9] Jabłonka – stolica polskiej Orawy, eds. Kolwaczyk Robert, Zgama Barbara, Nowy Targ, Zakład Poligraficzny "MK", 2012.

[10] *I Światowy Zjazd Orawian na fotografii*, eds. Karlak Grażyna, Kowalczyk Robert, Zgama Barbara, Jabłonka, Tlačiaren Kubík Námestovo, 2013.

[11] I Światowy Zjazd Orawian. Jabłonka, 19-22 lipca 2012 r. Wydarzenia i wspomnienia, ed. Mlekodaj Anna, Jabłonka, Wydawnictwo "Zachylina", 2013.

CRITICAL ANTHROPOMORPHISM AS A RESEARCH TOOL OF LITERARY STUDIES (PREFATORY NOTE)

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Abstract: The article presents critical anthropomorphism as a potential literary studies critical tool founded on the ground of two turns in the humanities: the ethical turn and the animal turn. The critical version of anthropomorphism negates anthropocentrism and directs attention to critical empathy, thanks to which a traumatic experience of disinheritance from bestiality can be overcome and reinterpreted.

Keywords: critical anthropomorphism, critical empathy, literary studies, animal studies

1. Introduction

The posthuman animal theorist Kari Weil, while analysing the complexity and multithreading of animal studies, pointed at three landmark moments in the literary and critical theory which considerably problematized the animal question. These are, as follows: the language turn, the affective turn and the ethical turn. The latter, which took place in the 1990s, brought interest in anthropomorphization as a critical tool that is able to broaden the knowledge about human and non-human animals [7].

2. Critical empathy

On the grounds of animalistic studies, anthropomorphism is connected with critical empathy which, according to the trauma studies theoretician Jill Bennett, is a

"conjunction of affect and critical awareness [that] may be understood to constitute the basis of an empathy grounded not in affinity ('feeling for another' insofar as we can imagine being that other) but on a 'feeling for another' that entails an encounter with something irreducible and different, often inaccessible" [1].

From this definition it follows that a meeting, encountering, openness to touching and being touched [7], constitutes an indispensable element of ethical cognition. The cognition that is never closed but that is rather a process, an attempt to understand otherness. Nicos Papastergiadis defines it as vigilant surrounding, approaching the other, in order to finally draw aside the line of division and make the perceptive transformation [1]. Therefore, we are dealing with ethics which withdraws from the position of dichotomic judging and celebrating the alone "self" (Foucault). This is the perspective of the other, the perspective of the non-human other, which makes the point of reference and view. Therefore one can say that the appropriate critical anthropomorphism is based on continuously renewed focalization which enables - to use Timberlake's concept - stepping into somebody's shoes and taking a stroll in them [2].

2. Critical anthropomorphism

The mere concept of critical anthropomorphism was introduced by the ethologist and cognitive psychologist

Gordon M. Burghardt who - following the thought of Ronald Griffin about opening to the diversity of forms of thinking and communicating of living beings - regarded this procedure as productive and protective against the primary, reflectionless anthropomorphization connected with a temptation of anthropocentric narcissism. In his essay Cognitive ethology and critical anthropomorphism. A snake with two heads and hognose snakes that play dead the author notices that this is an "heuristic method which could significantly affect the process of understanding animal and human behaviours" [3]. Marc Bekoff thought in a similar vein, proposing biocentric anthropomosphism, as well as Frans de Waal, who focused his attention on zoocentric anthropomorphisation. Burghardt's project assumes the existence of individual, subjective experiences of non-human animals, which in the species (and extraspecies) dimension create their own history. Also human animals that should become aware of evolutionary link with other species and consequently negate hierarchizing speciesism (Ryder) are a part of this history. Thus this is not about parallelism of forms, but being receptive to the affects and abilities of the other, to their causative character and significance. An important aspect is also to dynamize and go through the difference as indispensable and therefore often traumatizing.

3. Critical tool

What is the importance of critical anthropomorphism for literary studies, especially in their historical dimensions? First of all it allows for a new recognition of humananimal relations in texts excerpted from the definite time interval. It allows for their setting in the context of discourses and narrations functioning at the time. Examining a text and meta-text one can see a number of factors determining the author and their environment, forming the ways of thinking and constructing the reality. It is noteworthy that non-human animals as boundary carriers of otherness appear in the presence of human otherness, most often excluded or pacified. Animals, as the great absent, silenced and enslaved, stand in one line with "domesticated" women, colonized strangers or angrogynic others. Thus recognizing the relation between the human and the non-human may indicate not only direct bonds of beings from different species, but also transferred by them social, political, ideological or economic areas which in the definite time require discursive and extra-discursive redefinition.

In the textual space of animal narrations and empathic observations three potentials meet: those of the researcher, author and animal. These potentials are blurred, since their boundaries stretch and cross in the process of reading experience and the experience which motivated the writing act (author/animal) and interpretative act (researcher). According to Ryszard Nycz: "We can understand what the text is about as long as we experience it; we can experience it as long as it reactivates in us and changes the adopted structures of understanding" [6]. Therefore anthropomorphising devices can have inclusive character, enabling understanding of the non-human and human life through the text.

4. Human-non-human literature

Human and non-human areas condition each other through specific feedback which may within the text may reveal on the level of an author's revision. This is the case of one of Polish socrealistic poets, Stanisław Piętak (1909-1964) who, responding to accusations of the critics for the excessive "animalization", both in terms of brutality and animal characters, of his poems, used to constantly edit them. Referring to the species taxonomy by Donna Haraway, this author created a "lyrical communion" with companion animals (dog, cat), as well as with those working (cow, horse), wild (birds), alien (insects) and also - wider - with associated species (plants) [4]. This poetic communion however is not a non-referential one - animals are tangible in it, they are experienced and they experience, they penetrate the reality as indispensable and causative subjects. Similar is the case of the Polish feminist and darwinian writer Zofia Nałkowska (1884-1954), who in the animalhuman relation tests inter-species bonds and their libidinal determinants. And also in the case of another Polish interwar period's feminist Irena Krzywicka (1899-1994), for whom the observed human and non-human animals together are subjected to the machine of culture constraint. Her emancipation project, however, mixes with constantly renewed trauma of strangeness, which turns into sense of guilt towards other species. The experience of the problem of captivity is - as it seems - the main determinant of the author's writing. Its trace can be noticed in the short story Stosunki w kurniku (Relations in the henhouse) from the autobiographic volume Mieszane towarzystwo. Opowiadania dla dorosłych o zwierzętach (Mixed company. Short stories for adults about animals), where she describes, among other things, the behaviour of one of the raised speckled hens. The hen, wishing to prevent people from stealing her eggs, escaped to a nearby garden to hatch her young. Only when the miracle of birth occurred she let her children out of the hiding place. She won the author's recognition for this action:

"One must also stress the strength of her character: as everybody knows, the hen after laying egg bursts into hysterical scream, announcing this spectacular news to the world. The speckled hen, however, did not shout, did not sob, did not bawl, because she would have been uncovered. She suppressed her joy and triumph, (...) she already showed the final, impressive achievement. She was also able to choose free life, beyond the frames of the henhouse (...)" [5].

The author, emphasizing the animal agency, gave her emancipation character, at the same time pointing at the over-species need of self-realization.

5. Prefatory conclusion

voice Giving to non-human animals through anthropomorphizing narration is risky, but - as it seems inevitable. It happens because man (human animals), just as other species, is set in the own self, in the own species sensorium, which from the biological point of view should be understood as the sum of sensory and cognitive determinants of the given organism. The richness of communication network sensoria creates which. positioning inter-species relations, never exhausts its performative potential. Thus a textual attempt to personate a non-human animal create the opportunity to ask questions which would not be revealed without assuming the non-human perspective. Thus entering the position, situation of the other is not only aestheticization, but a critical cognitive tool. However, the author, but also the author's researcher, deciding on such a procedure, must realize that responsible personification, which in this case means emphatic (not sentimental), involves the necessity of improving the knowledge on the given species. Different approach would be an expression of anthropocentric ignorance. Learning the animal order requires sensitivity and openness, as well as crossing scientific and extra-scientific inertia.

References

[1] Bennett J., *Empathic Vision. Affect, Trauma, and Contemporary Art*, Stanford University Press, Redwood 2005, p. 10

[2] Burghardt G. M., *Critical Anthropomorphism*, *Uncritical Anthropocentrism*, *and Naïve Nominalism*, "Comparative Cognition & Behavior Reviews", Vol. 2, 2007, pp 136-138

[3] Burghardt G. M., Cognitive ethology and critical anthropomorphism. A snake with two heads and hognose snakes that play dead, in: C. A. Ristau, Cognityve ethology. The minds of other animals. Essays of honor of Donald R. Griffin, New York 1991, pp. 53-90

[4] Haraway D., *The Companion Species Manifesto. Dogs*, *People, and Significant Otherness*, Prickly Paradigm Press, Chicago 2003

[5] Krzywicka I., Mieszane towarzystwo. Opowiadania dla dorosłych o zwierzętach (Mixed company. Short stories for adults about animals), Czytelnik, Warszawa 1997, pp. 76-77
[6] Nycz R., Textual Experiences, "Second Texts", Vol. 1-2, 2010, pp. 6-12

[7] Weil K., *A Report on the Animal Turn*, "Journal of Feminist Cultural Studies", Vol. 21, No. 2, 2010, pp. 1-22

DEVELOPMENT OF PERSONALITY IN HISTORICAL AND SOCIAL CONDITIONS IN THE WORK OF LAJOS GRENDEL

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Abstract: Sense of the the duration of the past in the present, for nonrupturable link and tensions between them, of which the sense of comparison - in the light of the past, this confrontational gesture Grendel throughout the formation of leave. Hence the great sensitivity to injustice, trauma and guilt of the past, especially those where a person not cleansed, it remained "unexplained absences" catharsis nevykúpené and distorting the individual, society and time. Grendel's uniqueness lies mainly in understanding the world, philosophy of life, psychological and social aspects, the specific rendering of the human being, happiness and time as a significant part of his fictional works. The author's penetrating synthesis of the thought processes of the individual essence of human understanding.

Keywords: Lajos Grendel, novels, history, society

1. Aspects of the creation of Lajos Grendel

His birth town is Levice. In case of Lajos Grendel we emphasize it because we often meet in his novellas and novels with his birth place, a small town inhabited by Hungarians, the previous and the present society, "puppets", moral norms, with everything what life is and life was. Lajos Grendel depicted in his novels everything what had to reach the surface in a man, everything that was necessary to overcome and what influence history has on thinking and on acting of his characters. This revelation of things, characteristics and feelings in a man not only at the background of historical changes but also directly in them evoked many dimensions of a new stage of humanity and a new view on home which was artistically enriched by historicism, penetrating to human, national and historical reasons. The author in his works of some synchronous composition puts one human destiny next to the other, to the third and to the fourth. In this way he creates a mosaic of life of families and individuals living at the border area. And what's more every single destiny is itself dramatic and step by step as we go deeper into the net of the destinies and human relationships "exotic" characters are becoming typical characters. Grendel, however, in those next to each other standing and overlapping destinies always uses the diachronic aspect as well. The town as a sovereign being with its own past and the present. The novel about destinies of common people in which a human desire for happiness is being reflected. The author in his works shows diversity of urban society and identities that are surviving in the town. Finally, he does not place them into an opposition, but on the contrary he prefers coexistence of ethnic Ethnicities in which individual destinies share one space. The town itself is placed into the main role as well with its nature and specificity. The town that accepted everyone who wanted to live his story in it, the town that formulates people, and the people who formulate the town. This fellowship of cohabitation created one big mass moving ahead. By moving ahead the

town tried to absorb every new thing, every man or information. By this the epic outline is being developed, based on floating as a part of the environment which is dominant at Grendel while an individual story of the characters is secondary. The author is not focused on setting gaps between the individual Ethnicities but he tries to understand them as the whole developing in a microspace. After the high school graduation Grendel studied for one year Maths and Physics at the Comenius University, then he left for the Philosophical Faculty where in 1973 he finished his studies as a Hungarian -English pedagogue. As a Levice born author he connects his spiritual beginnings with the beginnings at the University. Bratislava student times opened to Lajos Grendel all the possibilities of spiritual orientation. His works "geographical" – and considering living conditions – and value structures set the change of place from a small town to a metropolis and vice versa. In Grendel's works a village and a small town provincialism gets strong criticism, its reduction of freedom, insignificant interpersonal relations [15]

The author depicts the environment that is close and familiar to him very persuasively. To depict the environment he uses a frequent description of characters typical for this region. Description of the environment effects on the percipient by the effect of authenticity. Till 1987 Lajos Grendel worked as an editor in Madách publishing house, then for two years he was a deputy of editor-in-chief. In 1999 he became an editor-in-chief of Irodalmi Szemle, later an editor-in-chief of a literaryartistic magazine Kalligram where he enlarged the border of Hungarian literature in Slovakia and the values of this literature were ascended to the level of European culture. When we look at his age theoretically he would suit to the generation of Egyszeműéjszak and Fekete szél, his debut work was published in IrodalmiSzemle in 1970. In 1979 was published his collection of novellas named Hütlenek (Neverní), where he writes about confusing of personality,

about autonomy and about the right for freedom. The themes of his strongly social novellas are rebelling against repulsive, opportunistic characters. Already here it is possible to observe a certain artistic feeling that extended Hungarian prose to new areas. And thanks to this fact he came to the forefront of Czech-Slovak Hungarian literary prose. Gyula Duba in critique Valóság ési rodalmiság states that the world in Grendel's novellas indicates a strong sense of form and systematic stylistic. He finds dramatic possibilities and situations in real western Slovak environment and in the picture of reality that lead to the ethical conflict [3] About the author of the novel Ostrá strel'ba (Éleslövészet) (Live Fire), that was published in 1981, - not to quote Slovak and even many Hungarian reactions - Transylvanian Gustav Láng writes: "according to him the chosen form at first prohibits that agreement about which the reader knows that he is reading fiction but at the same time he acts as if he were experiencing a real story. He emphasizes Grendel's impressive knowledge of traditions." [3] To this we add the most important virtue of every writer, observation and analysis skills and intelligible language. Besides this he knows well Slovak -Hungarian reality, effort of Slovak - Hungarian intellectuals, their fight with windmills, ethical fight, fights of this social level, obsessed, national - ethnic missions of Members of Parliament, problems influencing their biological (sexual) life. He knows several characters of people such as coward, careerist, opportunist, dreamer and a sincere man. This fact has been reflected in the novel Ostrá streľba (Éleslövészet) (Live Fire), that makes the trilogy with Odkundesi (Galeri) and Odvodeniny (Áttételek). Doubts put into the possibility of writing a novel he combined into the form of a novel. In the novel Ostrá streľba (Éleslövészet) (Live Fire) he describes the situation of a historical failure but despite the sadness Grendel created those thematic areas that he will rely on in his later works. He acquires the reality, in other words he aesthetizes it, antrophomorphization of a man left at the mercy of history. Grendel's narrator again and again experiences history according to his own inner rules and givennesses. His aim is never some practical target but building own personality, spiritual formation. This intensive recalling, ontic activity of consciousness is evidently presented in every part of the trilogy, but as an element of novel reflections is presented only in Live Fire. In here, the ability of narration, aesthetizing the past and outer plots occurs from the beginning as a problem [19] According to Zoltán Németh: "Grendel's novel attracted attention to itself just because on one hand it implements that postmodern turn that made a claim for renewal and revaluation of Hungarian prose language, on the other hand it keeps such referential view to which treacherous accusations cannot make any harm. Infidelity, betrayal because of what? Infidelity, betrayal against personal minority - Slovak - Hungarian and historical themes. There in Grendel's novels are from the beginning such pairs as isolation and universality, obscurantism and progress, ideology or autonomy which thematise possibilities of the artistic work." [9] The following work is not an antinovel, it starts to be a novel and it will be a

novel. Galeri (Odkundesi) (was published in 1982 and there, similarly as in the previous novel, stands at the sight of the reader the loss of postmodern illusion model. The structure of the novel consists of parallel biographies, life turns and of collection of provincial portraits. The question of ethnic life and with this fact connected forms of human behaviours are in the centre of attention in his third novel. The novel called Odvodeniny (Áttételek) (Gears) that was published in 1985 not only in domestic Hungarian but also in Slovak and Hungarian press aroused a great interest. To the source of success also helps an unusual narrative solution. Grendel has a special talent to encourage his narrator and characters to such an "ontic activity", to such a simultaneous experiencing the present and the past that does not act as the author's wilfulness but as a naturalism of things. The novel is about an experiment to emerge, about the desire for freedom, about putting an end, about the apathy and about opportunism where the main hero collapses very soon. The novels Éleslövészet, Galeri a Áttételek (Ostrá strel'ba, Odkundesi a Odvodeniny) (Live Fire) were published in Slovak language as well in 1985. After the success of Grendel's trilogy in 1986 he was awarded by the Slovak Writers Union Award in Prose.

And at that time came to life a real possibility, that Grendel's work based on motives: reality - fidelity peasantry, upheaval of problematic and relativity (Czecho) Slovak – Hungarian language, preference of readers fiction would not be only an alternative, but to be changed by a new paradigm. This possibility could not be fully realized because besides Grendel's novels his generation authors did not produce such works that could radically enlarge this program and direct it to the change of horizon. To this fact contributed that that Grendel like prose and poetics thematically filled in at that time the requirements of paradigm system. He focused on depicting of (Czecho) Slovak - Hungarian problems of being. The process of approaching of two horizons and final resulting into one horizon we can observe in Grendel's work. The beginnings of radicalism are gradually changed to unsuccessful, inappropriately explainable synthetic tendencies. [11] In 1987 his collection of novellas called Bőröndök tartalma (Obsažná batožina) was published. In this collection he used the identical style of writing as in the collection called Hűtlenek (Neverní, but only with smaller combination of fantastic elements. The following novel with the name of Szakítások (Rozchody), which was published in 1989, deals with the problems of the present. Readers and critics had different opinion on the novel, by many it was considered as a failure compared to the previous novel. In Hungary it was also welcomed differently but still it would be suitable to mention one notice of a Hungarian critic: "This Grendel's book is so far his most disciplined and the most sophisticated work. Already now he is not writing hypothetically about the state of the Czechoslovak Hungarian life, he is not talking about what he should be writing about if he should refer about it, he knows and wants to talk about the life of people of his own age and he is not analysing it only in any digressions but he dedicates his whole work to this

theme." [17] The biggest virtue and value of this work is that the philosophical truths and imaginations of everyday life situations do not exclude each other. The story itself which is not typical but trustworthy plays a great role as well. There in our literature exist only few such stories about love that are able to rise above own bonds and only very few stories in which we could read about love in three which easily accept interpretation of life philosophy.

After the novel Szakítások (Rozchody) Grendel's texts gain other form and other direction. He creates a new ironical type of novel where he depicts the state of Eastern European failure and helplessness. In Grendel's irony contrariety of his omnipresence is being melt and is out of reach of everything. The same happened in the fifth novel that was published in 1991. In the work Thézeuszés a fekete özvegy (Tezeus a čierna vdova) he stands in the spotlight the ways of loss of personality which he depicts by naturalness, spicy humour and by a rush turn of the story. Novelty in the novel is calling of mystical dimension, but because the narrator is looking for life truths he cannot allow logic of myths to prevail over him. In 1991 an essay and a collection of talks called Elszigeteltség vagy egyetemesség (Izolovanosť či univerzálnosť) was published. The main range of questions in the work: culture of mother tongue, tradition of Hungarian literature in Slovakia, national traditions and at last life and existence of minorities. The penultimate chapter of the book is a document named Pozsonyi földrengés (Bratislavské zemetrasenie), it is a diary of "Velvet Revolution" from the year of 1989. In autumn 1989 Grendel as a founder of an organisation called Független Magyar Kezdeményezés put a lot of hope to the future periods not only in the field of politics but also intellectual. The final part of the collection is Abszurdisztán that indicates a certain loss of illusions. In 1992 a published booklet of essays called Rossz kedvem naplója reflects not only uncertainty but also disillusionment. Disappointment and anxiety which are noticeable in his documents indicate basic ideas of the following Grendel's work.

In 1992 Einsteinove zvony (Einstein harangjai) were published and Lajos Turczel states: "Grendel's way of writing went through strong changes but there are also visible intensive postmodern processes. The changes from the basis consist in the fact that the author is not playing with the chosen theme anymore but he is analysing them in detail. This work could be understood as an earlier type of modern novel if the story were not overlapped by postmodern elements." [4] There, in the novel Einsteinove zvony resonates "existing socialism" that is remembered by the reader with joy as the past. Young readers and less forgetful might consider the world of Grendel's work to be uselessly swarming at a certain period border and that is what a spiteful writer put into the heart of action because such dramaturgy satisfies his attractiveness towards peculiarity and absurdity. Before writing the book Grendel did not have to attend tutoring at Becket and not even at Ionesco and the reason why he was able to resist a detrimental effect of western influence is that among the cases of forty year long socialism belonged that that from

time to time they did not play the absurd drama in the theatre but it was performed among the props of "real life". That is why behind the abbreviation VÚA is hidden a multifunction organisation that is not being unknown and even not its employees with special nicknames. After publishing the novel there were held various discussions. [12] In the works *Rossz kedvem naplója* and he examines behaviour, making ones mark in society, spiritually ideological transubstantiation, varieties of renewal. The world in which we lived and still live does not bring into life tragic heroes but only procurers of historical pressure who are "controlled" by exact events. Grendel does not judge and also does not exonerate, he ironizes in the novel, at bond he reveals a man of that period. The hero in the collection of essays Moja vlasť, Absurdistan (A hazám Abszurdisztán) does not get help from mythology but he draws from psychology. There appears his self-confidence to him as his alter ego which tells about uncomfortable truths.

In the collection of novellas called Az onirizmus réfái (Výčiny onirizmu), that was published in 1993, he deals with the questions of justice and reality similarly as in previous collections of novellas. In a series of novels from the 90s, a "sad play" named És eljön az Ő országa (A príde jeho kráľovstvo) was published in 1996 but in fact it is again an "absurd story". The novel, in fragments, informs about the state of missing freedom in which the author had to live. He here writes about a permanent political and social situation after the revolution in 1989 and about the mockery of author and human hope. We find ourselves face to face to such postmodern novel in which the politicizes, meditates hopelessly narrator desires something, though we could read the individual chapters in any order. This book also did not meet with a great success. Domestic literary criticism mostly considered the Grendeol's novel to be an unfortunate experiment. Many proclaimed their excuses against postmodern style. Zoltán Németh expressed himself about this wok as following: "The latest Grendel's novel És eljön az Ő országa (A príde jeho kráľovstvo) wanted to dazzle the reader with its significant postmodernism, alternation, kaleidoscopic rotation of fictional worlds. The fiction of the text according to several interpreters remained on the level of the actual sense and because of this it got into the contrast with the starting point." The novel És eljön az Ő országa (A príde jeho kráľovstvo) is fractional evidence about being born in the situation of existential trap of minority literatures. At the same time it is funny and bitter reading, sometimes it is picky taciturn, flat and tirelessly boring. He leads a man into doubts instead of taking him to himself as it was done in the novels of previous periods. [8] We can say that Grendel's novels so far mostly analyse a Middle European man, closely analyse behaviours of an ethnic man, mostly their failure, their unsuitability in critical situations, they indicate only postmodern life feeling. His novel Hromadný hrob pri New Honte(Tömegsír, 1999) is an exception. Here he puts an end to the most eccentric postmodern features and to the imaginative postmodern world. Dailiness and little human problems come to the front of the novel Hromadný hrob pri New Honte

(*Tömegsír*, 1999). Thanks to the use of language and stylistic means the author had possibility to exalt the world influenced by the political situation. There are no dramatic situations and conflicts, no real contradictions, and after all it does not have sense to look for some truth in a fictitious world of novel.

The novel Hromadný hrob pri New Honte (Tömegsír, 1999) has been conceived upon novel-poetic principles, by using language and stylistic means. The novel has been consequently assigned among Grendel's earlier novels which, thanks to use of aesthetic- stylistic means depict a man of Eastern-Central Europe, mostly an ethnic man with unique human-existential problems [14] The language of the novel Tömegsír (Hromadný hrob pri New Honte) is getting closer to minimalization. To this minimalization as Zoltán Németh defines like this: On purpose he is using narrow dimensions, heartless and flat characters, weightless, taciturn, laconic possibilities of descriptions. Here he points at Zoltán Abádi Nagy who considers minimalism to be language of prose after postmodernism. This novel is so easily being read that anyone who expects great, metaphysical questions and their solutions he will put away this book with disappointment. There are not any dramatic situations and conflicts, even not contradictions because it does not have sense to look for any kind of truths in the world of novel. There cannot be realized a concentric movement of history in this novel, actually nobody is able to realize own petty dreams, imaginations, but even they cannot keep the idea of independence [10] In the first sentence of Grendel's novel Král' Matej v New Honte (Mátyáskirály New Hontban, 2005) we can read that this could be a free completion of the trilogy because the place is the same, New Hont, a fictitious small town and its surroundings similarly as at previous two novels (Hromadný hrob pri New Honte, Unás v New Honte – Tömegsír, Nálunk New Hontban). Besides literary historians who think in system tri- and tetralogies, cycles, but also editorial specialists and some writers too, like to create a unique whole out of various works.

In the last three New Hont novels, Grendel evidently tried to reach newer version of absurd style, evidently got simplified, he became more homogenous, more decent in fantastic depicting, he uses prosaic processes for more direct referring to reality, more transparent narration and language.[5]

Lajos Grendel's novel Život dlhý takmer štyri týždne (Négy hét az élet) was published in 2011. Grendel compiled one fictitious destiny into four weeks, barely divided moments of the past and the present: the chosen life is not only good or bad, a lot of reality is running away from it. In this retrospective frame Grendel develops a tragic story of a man who is not able to cope with the traumas of family life and a deep inner crisis he solves by escaping to solitude. Lajos Grendel in changing rhythms, by not keeping temporality introduces his hero who becomes the witness of the plot, his passivity towards the whole life forces him to be more vulnerable because of his own past. It is typical that Grendel's hero only in the static period, during four weeks of his return home, is able to face his own past and he himself. [6] The novel Láska na diaľku (Távol *a szerelem*) is Grendel's twelfth novel. The novel was published in 2013. It is the newest piece of life work, also there it is possible to observe stylistic and technical changes, but in the basis it is the work of reliable and balanced writer's product. The novel *Láska na diaľku* (*Távol a szerelem*), if we look at the size of it, is rather a novella. The story of love is intertwining into the fairytale but finally we have to realise that the text is firstly dealing with experience with old age. Nothing is finished calming, threads are not finished, as actors are mixing days so we are mixing years and time zones [13]

2. Grende´s unique

In the period of years 1975 - 1983 a literary magazine -MozgóVilág (Svet v pohybe) was published. It was created by young writers and in fact it was a forum of at that time so called "other (liberally) thinking Hungarian intelligence." Its part dedicated to polite literature was not radically different from similar literature published in other magazines but in theoretical part, there were represented all the important ideas streams of Europe today. In the case of Lajos Grendel there is a negligible fact that his literary debut is overlapping with the "golden age" of the magazine and what is more important is that he was connected with the circle of editors and contributors by strong personal relationships and ideological affinity. He really adopted everything adoptable from the group Mozgó Világ, he waded through the philosophy (mostly Kierkegaard and Heideger), through sociology, linguistic streams which were an inspiration for well educated theorists of "Mozgó". But while there in their school was presented a sort of postmodern moral relativism, even antiethics, Grendel added the more ethics to the adopted. The base of grendellike novel quality became at first tension between his differentiated ethic sensitivity and a literary model of antiethics represented by the mentioned magazine. The common factor of this trilogy was postmodernism in its most general concept. In this sense on one hand the way of shaping becomes the content itself, and on the other hand the author tries to create a certain kind of semantic opening, flexible "field of possibilities" [20] Sense for lasting the past in the present, for inviolable continuity and tension between them, from this also the sense for comparison - in the light of the past, this confrontational gesture does not leave Grendel through all his work. From there comes a great sensibility to injustices and guilt from the past, mostly those from which a man was not purged, reminded in him "unexcused", by catharsis unredeemed and those which deform an individual, society and the era. Grendel's unique lies mostly in understanding the world, life philosophy, psychological and social aspects, regarding specific depicting of human being, happiness and time as a significant part of his novels. The author's synthesis goes through the train of thoughts to the individual base of human understanding. Especially through the renovation of the town its history robbed by Levice and his world in the trilogy is possible to see some similarity, an orientation point in Mikszáth (compare At Us in New Hont) and partially in Márai's bourgeois world, especially in the

memories of a grandmother in. The description of the First World War outbreak in the work Odvodeniny is thematically identical with the event at the end of the first volume of Márai's Confession of One Citizen [16] Eastern European and Central European literatures had influence on the work of Lajos Grendel. I see an influence on one side by a dominant South American, magical realism by Borges, and on the other side inclination to regionalism as literary worked out theme by Faulkner (depiction of the states of South America) but also at Mikszáth's description of province. Lajos Grendel at writing his literary works has also been inspired by literary works of Gyula Krúdy. Specifically by works of Aszonyságokdíja because it reflects a gradual shift from postromantic to realistic prose, without absolutely loosing Art Nouveau-postromatic style. The next work is Szindbád, in which the presence of eastern (dreamlike) and southern (realistic) influence is the dominant element. [18] Those strange settlements of influences of world-, national- and state folk literary are for Grendel at least the beginning of his runaway, lately a kind of reaction to common advertisement for guaranteed retreat from stereotype. At the beginning of the 90s L'ubomír Feldek, in pages of Literárny týždenník, called him a Slovak writer writing in Hungarian language. That brought reaction of a significant Hungarian poet Árpad Tőzsér that Grendel is a Hungarian writer living in Slovakia.

Also this by nationalization characterized period and from it resulting misunderstanding or misapprehension proves Grendel's acceptance in Slovak social life. In a review for Zväz slovenských spisovateľov (the Slovak Writers Union) Gyula Duba writes about Lajos Grendel: "Ideality, sophisticated irony and good stylistic abilities ensure a rightful place to Grendel in the first lines of our ethnic prosaic work." [1]. Karol Tomiš in evaluation of Grendel's so called "little novels" states that, "these are works of the author obstinately looking for answers to certain basic questions of his generation and nationality." Lajos Turczel includes these Grendel's novels among existence works. And also it is important to remind a notion of Karol Wlachowsky, a merited interpreter, thanks to him Lajos Grendel's works in Slovak translations appeared at the sight of Slovak readers, who states: "As regards the main theme of Grendel's prose it is possible to say it is the destiny of a member of ethnic minority. I specially appreciate at his prose critical distance from historical cliché, irony, self-irony, even critical selfawareness in relation towards self and towards negative features of members of Hungarian ethnic minority." [2] Grendel does not deny his membership to ethnic minority, but it is necessary to add that he is also universal, in addition, it confirms his interest in "new", thus in translation new Hont (a region in Southern Slovakia). A characteristic feature in his works is a certain overview in ethnic questions on the level of citizen life. Grendel's works draw us specifically into the problem of ethnic minorities, coping with everyday problems thanks to the influence of political situation by using irony even absurdity. A remarkable importance of Grendel's books of Hungarian literature in Slovakia, similarly as their

undeniable importance in context of Hungarian and Slovak literatures, is necessary to see in the fact that the author succeeded in creating an epic hero who does not represent only a narrow group of people but also a universal human existence. His hero as the bearer of representative knowledge of the time and historical memory tries to answer the great challenges and the questions of the time, or at least he tries to order them within himself. Sándoe Márai, a Hungarian writer, writes in one of his Diaries: "When (Nietzsche) said that the hero of the Greek tragedy is a hero because he fights without hope for victory, he expressed such an opinion that has a so liberating (or destructive) influence as the nuclear energy."[7] Grendel's citizen with his intellectualism, irony definitely deplores a mass man without a face, so called " vagabonds", sometimes giving up their being and making compromise with social being, but the criteria on which behalf he judges, he more or less only suggests. An "ethnic viewpoint" and "minority destiny" in Grendel's work represents only a starting situation, and as such they can only be an aspect of understanding otherwise a universally valid model, and not the content filling the model. Slovak reception of Grendel's novel in contrast to Hungarian reception in most of the cases was not adequate not only because in the given social and cultural - political conditions it was not possible to talk about certain plans of meaning, but also because that critic was frequently searching in it for meanings by the traditional way and did not notice that it is an open structure that probably will discover other meanings in every part of history. The participants of the mentioned discussion in the magazine Romboid compared Grendel's book to, for example, novels by Ladislav Ballek and Ivan Hudec, in connection with them they tried to find meanings in it that have already been formulated somewhere else, instead of trying to formulate, in connection with Grendel's novel, their own "me" and own intellect confronted with the times.

References

[1] Andruška, P., *Stredo-európske kapitoly 2*. Nitra. 2008. p. 51. ISBN 978-80-8094-306-6 2008.

[2] Andruška, P., *Stredo-európske kapitoly 2*. Nitra. 2008. p. 52. ISBN 978-80-8094-306-6 2008.

[3] Bodnár, Gy.,- Tóth, L., *Nyomkereso*. Lilium Aurum: Dunaszerdahely. 1994. p. 233-235. ISBN 80-85704-25-0).

[4] Bodnár, Gy.,- Tóth, L., *Nyomkereso*. Lilium Aurum: Dunaszerdahely. 1994. p.235. ISBN 80-85704-25-0 1994.

[5] Elek, T., *Abszurdisztán kitartó fogságában. Grendel Lajos "New Hont regényeiről".* Kritika, 2006. 49. évfolyam, 9. szám, p. 917.

[6] Koncz, T., *Múlt, időben : Grendel Lajos: Négy hét az élet.* http://www.barkaonline.hu/kritika/2256-negy-het-az-elet

[7] Márai, S., *Napló 1968–1975*. In: S.M.: *Breviárium*. Madách: Bratislava. 1992. p. 253.

[8] N. Pál, J. Eheto- e a csirkepaprikas. Grendel Lajos: És eljön az Ő országa, Kortárs.1998. p. 113.

[9] Németh, Z., *És eljon a tomegsírok országha*. Irodalmi Szemle. 1999. p.126.

- [10] Németh, Z., *Grendel Lajos az irodalmi minimalizmus felé*. Új Szó. 1999. p. 19.
- [11] Németh, Z., *Talamon Alfonz. Tegnam és ma.* Kalligram: Bratislava. 2001. p. 47-48. ISBN 80 – 7149 – 183 -7.

[12] Šútovec, M., *Grendel Lajos: Einstein harangai*, Irodalmi Szemle. 1999. p. 66.

[13] Szalay, Z. *Az irónia túlpartján. Grendel Lajos: Távol a szerelem.* http://www.barkaonline.hu/kritika/3202-az ironia-tulpartjan 2014. 6. 6

[14] Szeberényi, Z. Magyar irodalom Szlovákiában (1945
- 1999) II. AB-ART: Bratislava. p. 140-148. ISBN 80 -88763 - 99 - 1.

[15] Szirák, P., *Grendel Lajos. Tegnap és ma.* Kalligram: Pozsony. 1995. p.19-23 ISBN 80 – 7149 – 109 – 81995.

[16] Szirák, P., *Grendel Lajos. Tegnap és ma.* Kalligram: Pozsony. 1995. p. 68 ISBN 80 - 7149 - 109 - 81995.

[17] Tóth, Zs., *Grendel lajos regényei*, Új Írás. 1990 r. 7. p. 96.

[18] Tőzsér, A., *Hranice Literatúry*. Kalligram: Bratislava. 1998. p. 84-100.

[19] Tőzsér, A., *Hranice Literatúry*. Kalligram: Bratislava. 1998. p. 95–105.

[20] Tőzsér, Á., *Hranice Literatúry*. Kalligram: Bratislava. 1998. p. 95–105.

THE SOCIAL CHANGES

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Abstract: The author will deal with the problematic of social changes in a traditional Romany family. He characterises a traditional Romany family and will find out what their choice of life strategies is. The issue of social change and family change represents such an immense amount of aspects that can not be due to their extent and at the same time deeply analyzed. In general, there are many factors which cause social change, induce or influence them. For social change are considered particularly changes in the culture of the company, changes in the social structure of human social behavior, changes in relationships between individuals and groups below. The factors include social change "culture". As such, it is thus able to induce change, but change the subject. Tradicionality spectrum interest in Roma culture will be selected under the regulations of socio-cultural traditions and customs: the birth and baptism, wedding, marriage and burial. The author points to their culture and important events in a traditional Roma family.

Keywords: social changes, traditional Romany family

1. Social change in a traditional Romany family

Change is a permanent characteristic of social life. In general we can characterize it as an acquirement of other characteristics, transformation of a structure or a situation in time. Social change is being characterized as a significant transformation of any social phenomenon such as culture, social structure of behaviour, etc. Social change is a part of human existence the society is liable to changes since its own origins. The basic question dealing with the problematic of social change is the question what causes the social changes. [18]

In general there exist a lot of facts that cause social changes, evoke eventually they influence them. These facts are called factors, determinants or the sources of social change and they usually create one of the basic elements of conceptions or theories by which the problematic of social change is being explained. A particular area of social change investigation is getting to know the factors which consciously or unconsciously inhibit from social change. Generally it is accepted that we live in the society of sudden, dynamic social changes. I can even state that if man wants to survive today, he must permanently adapt himself to the change. Social changes are mostly considered to be changes in the area of society culture, changes of its social structure of social behaviour of people, changes in relationships between individuals, groups, etc.

We consider William F. Ogburn to be the author of the collocation "social change". Introduction of the collocation is connected with the tendency to substitute by this term controversial concepts representing the terms progress, development, or evolution. Social change can concern to various demographic processes, social structures, cultural models, societies and their individual subsystems, organisations or groups. [23] Social changes are taking place in various areas of society life. They can take place in family, in population, in social stratification, in economics, and in other areas of social life. Single changes in society

are twisted, they influence each other, depend on each other and in this way they cause global social changes. [25]

Thus, from the mentioned it could be said that if there is a change in one area of social life, then with a high probability we can expect that there will be other changes in other areas of social life. Social change is any alternation in a cultural, population, structural or ecological characteristics of social system as the society. Sociological interest at explaining and predicting a pattern of changes started in the eighteenth and nineteenth century with a social shock connected with industrial revolutions and political revolutions that accompanied development of democracy. Despite those early ambitions focused on identification of social change these were abandoned in favour of theories closely aimed to exact aspects of social life such as politics, religion, economics, technologies and family.

In the essential meaning, to draw attention to social changes it is natural to all sociological works because social systems are always in process of change. In other words, to understand how social systems work or hold together we have to, on certain level, understand how they are changing or how they break down. [19] Problematic of social changes and changes in a family represent so enormous number of views that are not possible to be analyzed nowadays and deeper because of their range.

Changes in family life living represent one of the focal points in the thematic spectrum of sociology of family. That the idea of change in family sociology has an individual central position is nothing special because the analyses of changes is one of the main tasks of sociology – states Matthias-Bleck in his remarkable study in magazine Soziale Welt. [11] Social changes are done in many areas of life of society while he places the family on the first place. The changes he is talking about are happening either simultaneously or gradually, they often happen to be dependent on each other and connected, they influence eventually condition one another. It is necessary to observe changes of specific matters in a family, e. g. choice of spouse (who is choosing him/her, from which social group or level), way of marriage contraction and family, changes of family functions, relationship of spouses, preferred place of living, development of number of children, divorce rate, etc. If we are talking about family change, we will derive changes from concept of so called "traditional normal family". The picture of "traditional normal family" looks quite often as extremely homogenous, it features forms of family life in which both parents of children are husband and wife living together with their children in a common household. [9]

Roles in this type of family are according to the conventional image gender-typically divided, father, usually, is employed outside the family, it is connected with commuting. Mother is bringing up children and takes care of household. Her role is connected with an expressive behaviour (emotionality, sensitivity and understandable focus on needs of other members of the family). Children attend school and prepare themselves for their future profession; they participate on housework according to their abilities. Conflicts does not predominate in this type of life, everyone accepts own role in the family and that makes the pillar of prevailing harmony in the family.

Everyday life in the family has significantly changed especially in connection to children. By the change of cultural and structural conditions of organisation of family coexistence there occurs a change of power relationships between parents and at the same time there is "emancipation" of a child. The main focus of upbringing in the family is shifting gradually more and more from obedience and submission (to the authority) to the values such as independence and free will. This finds its reflection in housekeeping as well, where increasingly an agreement of all the family members is being applied compared to the previous, in the Slovak Republic recently decisive position of parents, especially father. The relationships in the family are less and less signed by hierarchic and authoritative treatment of children and also between the parents. [18]

The basic needs of inhabitants of marginalized Romany communities nowadays are satisfied almost only by social income thereby generally it closes their chance to cross the border of the existing way of life. In Romany segregated settlements almost all families have existential problems without any real possibility to improve their state (e.g. by employing themselves) what significantly increases assumptions to formation various negative phenomenon that are results of poverty.

We want to point out that disintegration and a low life quality of marginalized Romany communities is the result of social development that is influenced by socioeconomical isolation as well as by cultural specificities that are forming them in their environment.

Fundamental and the most serious problem of the Slovak Republic is solving bad social, economical and educational Romany ethnic minority and especially those marginalized Romany who live at the edge of the society in segregated Romany settlements. We think that the key to the solving Romany bad social status and their poverty is education and training.

2. Traditional Romany family

[14] states that: Romany family the same as other families goes through social development but it also bears in itself retarding trends, traditions and all features of Romany ethnic group." Family creates one of the most important socializing environments. It provides to an individual his basic identity, creates mainly background for the first knowing and emotional experiences. It is obvious that Romany family is often large. "A large family can rely on own strength and relatives' solidarity. A small, weak family is forced to accept exogamous marriages that break customary law that provides cohesion and indivisibility of the family and its property." [17]

According to Cangár [2] a traditional Romany family is characterized by life in a wider large family by a community way of life, an evident division of roles in a Romany family and by understanding of housing as temporary and provisional. Rosinský [20] confirms as well that: "a family lives gathered in close, word for word intimate physical contact." Male and female roles are clearly and firmly defined in the family. Romany women see their gender identity more defined as Slovak women. [3]

We cannot understand Romany family as a certain number of individuals but always as the whole. Families go through conflicts collectively; an individual always acts in the name of the family. The mistake the individual makes is judged as the mistake of the whole family. Also Rosinský [20] states, that everybody in a traditional Romany family had own place, everybody exactly knows own status and knew what is allowed to do and what is not allowed. Relationships between family members (father, mother, grandmother, grandfather, brother, sister) are very strong. An individual from traditional Romany family does not stay alone nor at home, neither in deathbed or in hospital. [10] Čerešník and Čerešníková [4] prove these findings and they put them into the relationship with collectivism as a cultural dimension. "At the present time marked by general fight for human rights and civilisation progress the only way out of this antagonism is just to look for the way to mutual understanding and social justice. Mutual true understanding, avoiding mistakes from the past and sincere path to myself are the starting points and basis of social balance." [17] Romany were and still are perceived by the rest of inhabitants as a parasitic group, as an asocial level of society. Many who wanted to break free from backward environment and cope with majority inhabitants by the way of life chose the path through conscious distancing from the ethnic origin what sometimes resulted in the way that the parents knowingly did not teach their children to Romany language. They try to imitate the way of life of majority inhabitants both externally, the way of housing, food, clothing, but also in the way that they demonstratively separate themselves from traditional Romany habits that they consider to be features of already overcome backward way of life.

When we think about the present exact situation of Romany and their relation with the majority, in general we may conclude that a Romany family even today represents a traditional type of a multi-generation family in which the family hierarchy varies. A Romany family is patriarchal, father has the main say in the family, mother is responsible for housekeeping and upbringing the children while here we can observe certain differences compared with the majority society. A Romany mother is not talking with her child about the things he is interested in she does not read fairytales to him and does not teach him to know the world around. She leaves everything to natural development [5].

Selická [21] says that: "The man still has the dominant position (among children the first-born son) but status of a woman is gradually improving. Even in nowadays families it is still not possible to talk about equivalence of partners, most of Romany girls and women accept this as natural and right. Romany girls are now getting married later than before, the number of children in marriages is decreasing, education and employment of women is also rising,"

Vodička [27] points out the fact that for a Romany family it is typical to have more children, a Romany woman is giving birth to 4,2 children in average, that is three times more than other mothers do while in backward settlements in average even 7,8 children are born in one family. Čonková [5] also points at this fact and she mentions the reason that planning family at Romany is very unusual phenomenon. On the other hand Kumanová [15] stresses out the fact that Romany family today has been changing and is characteristic for its decrease of fertility, infant mortality there are less deliveries of women over 35 years of age as well as number of primiparas younger than 18 years of age. We think that in this case socialization of Romany plays a very important role. We suppose that in this case socialisation of Romany plays a very important role. We suppose that settled Romany with the permanent address either in a town or in a village who are fulfilling their duties towards the state and the society are able to plan their parenthood. We suppose a high number of children of one mother at socially the most backward Romany who live in settlements at the edge of society.

A child in Romany family has a high value but parents wish to have sons more than daughters. Their upbringing is pedocentric, they get everything what they wish. Although the child is brought up in a collective, the main focus of his upbringing is on his mother who teaches him to speak, satisfies his needs and teaches him the habits of Romany family. The world of children melts in the world of adults which result is, according to Bakošovej [1], that there in the Romany family do not exist generation gaps. Helus [12] adds "the family is a basic environment of a child. It not only surrounds the child but is also reflected within him."

Romany family is gradually changing and in some Romany communities it is possible to identify the start of demographic revolution. Quantitative as well as qualitative features show the change of Romany family. Decrease of infant mortality and decrease of birth rate are characteristic for it as well as the average number of live births of one mother is getting down and there are fewer deliveries. There also happens a nuclearization of a Romany family there is a change in relationship between partners of the way of choosing a partner. Despite several smaller specificities family behaviour of certain Romany groups is at the present time not very different from family behaviour of majority population.

The gradual change of Romany family behaviour is influenced by determining factors such as the place of living (town-village, respectively segregate or nonsegregate living a Romany community), the level of economic and cultural maturity of the exact Romany community, socio-economical status of the exact family as well as the amount of positive contact with non-Romany inhabitants or the amount of Romany inhabitants concentration in this or that location. On the other hand even nowadays it is still possible to identify in traditional Romany communities characteristic features of a traditional Romany family. [26] Being Romany is a special value of Romany. There belongs a characteristic appearance, knowledge of language and habits but mostly polite manners. It has its own specificities in every family but for all Romany regard for elders, politeness, hospitality and solidarity is its part. Nowadays positive aspects of Romany identity are disrupted and relatively quickly they are getting weaker. One of the examples is giving up being Romany with a wish not to be Romany, leave the nation and not sharing its destiny. Some Romany do not want to be considered as Romany and they declare other nationality. This attitude rises from refusing relations of the majority with the Romany minority and from Romany place in the society.

Diversity of habits

A complex of present Romany habits, ceremonies and expression of faith differs in general and according to individual Romany groups as well. Members of extended families, of "strong clans", have till now bigger authority at the others and they help each other. Habits of individual Romany families were significantly different. The best described are habits connected with birth of a child, marriage and funeral. Keeping these traditions by individual members of families, including small children, was watched by the whole family; they immediately punished aberrance by disdain and rewarded right behaviours by regards. [6]

The family took care not to have any member in shame otherwise the shame would hit the whole family as the authors Stojka and Lakatošová, Kuchár, Davidová, Hübschmannová and others state. Romany avoid places nearby cemetery, morgue or place of execution. Romany believe in relicts of natural animistic religion that is manifested by belief in spirits of dead, by magic practices mostly love and black magic, by palmistry and cartomancy, conjuration, by giving evil-eye, folk medicine, everything is accompanied by invocation, conjuration and providing magic acts as Davidová states. Romany do not have their own traditional feasts, they celebrate common Christian feasts with other inhabitants. A newly introduced International Day of Romany on April 8th does not have tradition yet. [24]

2.1 Role of a woman

Men and women had different roles. Woman had to take care of the family. She was brought up in such way. Her duty was to keep the households, bring up children and obey her husband. Often she had economically more important role. She provided food and clothing. She had to get food in any way, by picking forest fruits, by doing works for villagers (gadzos), greasing furnaces, and working on fields or even by begging. The woman was supposed to provide children and feed the family. According to Davidová ways of eating belongs to the most conservative ethnic characteristics. Providing the food was an exclusive concern of a woman. [7]

Hübschmannová informs about a ritual purity that was kept by Romany women when cooking. Some foodstuffs were considered to be impure (e.g. meet of some animals) and all the foods became impure when they were reheated, fell on the floor or hair fell into them. Every family had its own technology of meal preparation and strictly enforced its keeping.

Often they did not have breakfast they waited till woman gets something to eat. Davidová states that Romany women were dealing with handling. They bought up old things from villagers, rags, feathers and then they were selling them or exchanging them to dishes or other manufacturing things. Woman, according to Stojka and Lakatošová had to be by side of her husband in good and in bad, take care of household and bring up children. She had a lower status than a man and she was not permitted to the community of men. Kuchár states that women from settlement lived in closed environment, were illiterate and in comparison to Romany men their entire awareness and overview were much lower. Casual labour at villagers was simple, did not require any qualification and did not give any chance for improvement. Status of a woman at Romany was very low, subordinated and dishonorous as Davidová mentions. Hübschmannová says about the relationship between a woman and a man that the man was a master for the woman. Romany man did not have any regard towards his wife, as Davidová states, despite this fact there were no divorces. Woman gained higher social respect only at that time when she gave birth to several children. After menopause she could reach equal status with men, mostly when she was able to decide wisely. The status of woman was seen outwardly by that the woman was walking several steps behind her man at public, as Žlnayová states. [6]

Position of a woman in Romany community at sub-ethnic group of Wallachian (so called Olach) Romany is in comparison with majority society significantly different. It is similar with Romany living in the area of Eastern Slovakia – thus, Romany settled, also called Rumungro. An Olach Romany woman after reaching 15th year of age becomes an adult woman. The engagement with in advance chosen fiancé of the daughter takes place in a grandiose style. After a year since the engagement there is a wedding in church. The wedding symbolises sacred marriage for them. It is necessary to emphasize that many Romany in Nitra and in surroundings belong to Christian religion. The wedding is pompous and demonstrates

After the financial and social status of the family. wedding a wife moves to husband. By this gesture the groom takes the whole responsibility not only for his wife but also for the family. Offspring and upbringing children are expected from a woman. It is important to mention that traditions respectively the status of women has not changed through the evolution. This position of a woman in the specific sub-ethnic group has remained since the distant past. Upbringing is an important attribute for development of an individual in context of society. The family is bearer of culture that is being reflected in behaviour on an individual. Olach Romany have never tried and will never try to assimilate into the context of majority. They are bringing up their children based on many years standing traditions and when breaking them it is punished very hard. E. g., if an Olach Romany falls in love with a "white woman" he is expelled from the family and they do not know him anymore. At "Rumungro" Romany it is necessary to mention, that they have assimilated in context of majority (from marriage point of view.[16] The status of a woman in a family has rapidly changed within the last two decades. While in the past the couples contracted marriage bonds, the divorces were out of the question, they had a large family but they were able to supply it. In present days young girls start with early sexual life without thinking. They live in illegitimate bonds; marriage does not mean a sacred institution for them. There are many reasons why and they would require more detailed analysis. Social impacts are one of the main. It is better to live in an extramarital relationship the final benefit in material need gets a little bit higher. Socially weak families cannot have an adequate attitude towards their education. The consequences are alarming especially many children from marginalized environment finish in foster homes.

2.2 Role of a man

A Romany man was the head and the guardian of the family, a bearer of family prestige. He was responsible for the family. Often the man's earning was occasional and so he spent his time by job hunting, keeping good relations with relatives and friends, settling the arguments between families. Man's infidelity is tolerated even woman very often publicly draws out what a womanizer her man is. On contrary, infidelity of a woman is inexcusable and thus unacceptable. Man can leave an infidel woman; he punishes her very hard by beating, mutilates her face and sometimes by cutting long hair till bald as Lakatošová states. [6]

Romany say that every woman knows man's hand. Man beats woman often because of jealousy what belongs to love, so when he is not beating it is the mark that he does not love. In fact the man has only one duty: to hand over money to a woman that he earns if he works. In some settlements men left all the work to women including getting wood for heating. By material security of the family man demonstrated how skilful he is and how he can take care of his family. Lakatošová mentions that man is supposed to be snaky. It is not important how he earned the money. [8]

2.3 Young bride

Girls worked with mothers. For a girl it was particularly important to learn to be a good wife and a future daughterin-law. She took care of younger siblings, prepared food, went with her mother to sell products to the market, etc. The girl was allowed to attend society only when accompanied by father, brother or by her future husband according to Lacková. Her upbringing usually continued after the wedding when she left for home of her husband's family. Here she could not make shame to the family that she came from. She was a help for her mother-in-law in women's labours. Daughter-in-law was supposed to be neat. Mother-in-law taught her daughter-in-law to cook such meals that her son is accustomed to. [16]

Till the moment her first child was born she had to be permanently at her mother-in-law's disposal. This time could have been difficult for a young woman. Kuchár states that "she stands on the lowest place in the family hierarchy because she is a woman, is young and is stranger. This time lasts for 2-3 years and is very hard because nobody would stand by the young daughter-inlaw. Only when she has two or three children, and moves with her husband to a new house. The young daughter-inlaw is fully accepted by man's family as its full-value member only when she gave birth to a child and proved well in the kitchen." [8]

2.4 Respect for elders

Wisdom in Romany community, traditionally highly appreciated, was manifested in a different way than at majority. It was given through talking about elders' experience, through the form of story, fairytale, myth, proverb, anecdote or riddle. Narrative is the spiritual riches of Romany, their life wisdom, experience, ethic norms and philosophies are so preserved. Genre, that was considered to be the top, were so called heroic stories, occasionally there were narrated short fairytales, usually humorous, but also scary mostly about experiences with ghosts of dead – muls, eventually also stories that were not for children and they had to leave. Lacková, Hübschmannová also confirm that Romany like to tell yarns about dead – muls who visit those who outraged against norms of life. [24]

2.5 Endogamy

In the environment of Romany ethnic social endogamy at choosing the partner used to be one of the significantly kept norms. In the past the social stratification of Romany community was set mostly by the way of livelihood, respectively by livelihood focus of individual families. The main indicators setting the social differentiation of Romany society in present days represent probably the amount of income, employment of individual members of the family and a certain degree of girls´ education to housekeeping.

However, even these new factors of social endogamy as well as traditional criteria of choosing can be much easier broken nowadays. Inner social ties are today so disturbed that the social influence of deviation from norm is not that noticeable as before and choosing the partner more or less depends only on the will of each individual. [22]

Lázničková mentions that till now Romany perceive marriage with "gadzo" as breaking internal norms. Later Lázničková adds: "it is interesting that marriage with a member majority was considered leniently than with a partner from other Romany group. Often in both cases it meant exclusion the individual and so the future family from the community". [6] Wider extension of ethnically mixed marriages is restrained by objective existing socioeconomical distances and also a negative attitude of majority society that still keeps social distance from Romany conditioned by persisting differences in way of life, thinking, in cultural level of both societies and by many other factors. One of the basic restrictions at choosing the partner in Romany community was always, according to Pelíšková, the restriction of choosing the partner in majority society. [26]

One of the evidence of much intensive mutual contacts of both ethnics can be increasing number of ethnically mixed marriages.

From the post-war years up till today connection with a non-Romany partner in some Romany groups is considered by the community to be prestigious, even there happens that the man takes the name of his non-Romany "white" wife and he is distancing himself from his family by this way.[24]

Features of the original culture are fading and are not substituted by other, new elements. The roots of the original Romany culture are still possible to be found at sub-ethnic group of Wallachian (so called Olach) Romany. On the other hand, at so called "Rumungro" Romany there are not noticeable any traditions, habits or customs mentioned in the normative texts about Romany culture in the past. We express our conviction of need to keep still "live fossils" of traditional living in the culture itself that besides the dominant cultures remained for the centuries. Abandonment, hunger, economic uncertainty and diseases are accompanying phenomena of life of the poor. Instead of conventional marriages unmarried cohabitation is common here. The youth does not finish school attendance during which did not master the values and conventions of the main stream of society (either dealing with behaviours or aspirations). People in many Romany settlements have only one warm meal a day; breakfast or dinner is absent very often. Cigarettes are substituted by cheap snuff and alcohol by cider.

Less standard solutions is then satisfying by semi-legal or illegal means and often unwillingness to give up the original range of needs leads to them. [13] We often forget the conditions in which the Romany live. Without work, income, in poor settlements or ghettos. We focus more on their media depicting, unfortunately mostly set into the negative light. We do not realize their hard and difficult social situation. Exclusion from the area of village or town in which they live, from social life and from the whole life of society is for them a difficult and often impassable barrier.

References

[1] BAKOŠOVÁ, Z. 2005. Sociálna pedagogika.
Bratislava: Slovenské pedagogické nakladateľstvo, 2005.
165 s. ISBN 80-10-00485-5

[2] CANGÁR, J. 2002. Ľudia z rodiny Rómov = Manuša andar e familia Roma : doplnková učebnica o dejinách a živote Rómov pre základné a stredné školy [preklady do rómskeho jazyka Viliam Zeman]. - 1. vyd. - Nové Zámky : Crocus, 2002. 237 s. ISBN 80-88992-42-7.

[3] ČEREŠNÍK, M. 2006. *Gender a ortogonálna konfigurácia jeho komponentov*. In Sociálne procesy a osobnosť. Košice : SAV. S. 66-75. ISBN 978-80-969628-4-6.

[4] ČEREŠNÍK, M. - ČEREŠNÍKOVÁ, M. 2007. *Rodovosť a schopnosť jej posúdenia rómskou populáciou v segregovaných osadách*. In: Metanoia - Harmónia človeka : 25. Psychologické dni. Zborník príspevkov. Bratislava : Stimul, 2007. S. 278-283. ISBN 978-80-89236-39-8.

[5] ČONKOVÁ, A. 2007. *Rodinné prostredie rómskych detí*. In Vychovávateľ. Bratislava: EDUCATIO. ISSN 0139-6919, 2007, roč. LIV, č. 8, s. 10 – 13

[6] FABIANOVÁ,T., - HüBSCHMANNOVÁ, M.1991.
 Čavargoš/Tulák. Praha: Apeiron.68 s. ISBN:80-900703-1-0

[7]HÁBOVČÍKOVÁ,B.,-HÁBOVČÍK,O.,-POLÁKOVÁ,

E.: *Culture, education and training of Roma in Slovakia.* Nitra: UKF, 1998. 83 s. ISBN 86-967937-0-5

[8] HANCOCK, I. 2005. *My rómsky národ. Ame sam e Romane džene*. Bratislava: Petrus Publisher, 2005. ISBN 80-88939-97-6.26. (30)

[9] HARDY, M. – DUDÁŠOVÁ, T. – VRANKOVÁ, E. – HRAŠKOVÁ, A. 2011. Sociálna patológia rodiny. Zborník z medzinárodnej vedeckej konferencie. Bratislava : VŠZaSP sv. Alžbety. 365 s. ISBN, 978-80-8132-000-2, s. 275 – 287

[10] HARTL, P. *Psychologický slovník*. Praha, Budka 1993. ISBN 80-901549-0-5.

[11] Heike Matthias-Bleck *Soziologie der Lebensformen und der privaten* ... Soziale Welt, Jg. 53, H.4, 423-436.

[12] HELUS, Z. 2007. *Sociálni psychologie pro pedagogy*. Praha: Grada Publishing, 2007. 280 s. ISBN 978-80-247-1168-3

[13] KOMPANÍKOVÁ, S., – ŠEBESTA, M. 2002.
Životné stratégie Rómov. In: VAŠEČKA, M [ed.]. 2002.
ČAČIPEN PAL O ROMA : Súhrnná správa o Rómoch na Slovensku. Bratislava : IVO, 2002. s. 599-617. ISBN 80-88935-41-5.

[14] KONEČNÁ, K. 1994. *História a súčasnosť rómskej rodiny*. Košice: štátna vedecká knižnica, 1994. ISBN 80-85-328-17-8.

[15] KUMANOVÁ,Z..DŽAMBAZOVIČ,R.2002. Rómska rodina: na rozhraní medzi tradicionalitou a modernitou. In VAŠEČKA, M. ČAČIPEN PAL O ROMA – Súhrnná správa o Rómoch na Slovensku. Bratislava: Inštitút pre verejné otázky, 2002. ISBN 80-88935-41-5. s. 503 – 526

[16] LIÉGEOIS, J. P. 1995. *Rómovia Cigáni Kočovníci*. Bratislava: Charis, 1995.

[17] LUŽICA, R. *Rómska národnosť – nenaplnená ídea. 261 1.* vyd. Praha: Euromedia Group, k. s., 2004.
ISBN 80-. 249-0427-6.

[18]ONDREJKOVIČ, P. 2007 Zmeny v spoločnosti a zmeny v rodine. Vyžiadaný referát pre Svetová konferencia o rodine v Prahe 15. – 18. 5. 2007

[19]ONDREJKOVIČ, P., -MAJERČÍKOVÁ, J. *Spoločenské zmeny a rodina*. In ONDREJKOVIČ, P. a kol.: Rodina v novom miléniu. Nitra : UKF, 2006. ISBN 80-8050-982-4

[20] ROSINSKÝ, R. 2006. *Čhavale Romale alebo motivácia rómskych žiakov k učeniu*, UKF :FSVaZ, 263 s. ISBN 80-8050-955-7

[21] SELICKÁ, D. 2009. Sociálna práca s rómskou rodinou. In Vychovávateľ, 2009, roč. 57, č. 6, s. 23-26, ISSN 0139-6919

[22] SCHEFFEL, D. – MUŠINKA, A. (eds.). 2004. Rómska marginalita, zborník z medzinárodnej konferencie, zisťovanie marginality a integrácie medzi znevýhodnenými skupinami, Prešov. Slovensko 25. – 27. 9. 2003. Prešov : Centrum antropologických výskumov, ISBN80-968905-3-0.

[23] SOPÓCI, J. *Teórie sociálnej zmeny*. - 1. vyd. -Bratislava : Univerzita Komenského, 2007. - 216 s. Lit. 359 zázn. ISBN 978-80-223-2321-5

[24] STOJKA, P. – PIVOŇ, R. *Náš život. Amaro trajo.* Bratislava: INFOROMA, 2003. 138 s. ISBN 80-969055-0-3.

[25] ŠUBRT, J., a kol. Soudobá sociologie II.: Teorie sociálního jednání a sociální struktury. Praha: Karolinum, 2008.

[26] VAŠEČKA, M. *ČAČIPEN PAL O ROMA – Súhrnná správa o Rómoch na Slovensku*. Bratislava: Inštitút pre verejné otázky, 2002. ISBN 80-88935-41-5.

[27] VODIČKA, K. 2003. *Rómovia na Slovensku: Prekážka na ceste do Európskej únie?* In Fórum občianskej spoločnosti. Bratislava: Kalligram, 2003. ISSN 1335-2296.

FAMILY ASSESSMENT: SYSTEMS THEORIES AND THEIR IMPORTANCE FOR ASSESSING SOCIAL RISK RATE OF FAMILIES

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Abstract: This report is supported by research project VEGA 1/0487/14 "Crucial concepts of selected systems theories for assessing social risk rate of families under the terms of child protection". The major aim of this work is a theoretical analysis of indicators for assessing social risk rates of families according to selected systems theories. Systems theories offer a good theoretical basis for quality enhancement of the process of assessing families. They point to the various dimensions of family functioning that are important to evaluate during the assessing process. At the same time they set up the indicators that can point to higher risk of the occurrence of dysfunction on various levels of the family system. Outcome of the theoretical analysis is a classification of social risk rate qualifying indicators.

Keywords: family, assessment, systems theories, social risk rate indicators,

1. Introduction

The society is composed of a great number of families which vary in their structure, number of children, mutual relations, and value systems. This variety is reflected in specific ways, in which the family supplies it's members' needs. Assessing family functioning therefore requires the assessor to be well acquainted with the complicated structure of the family system, as well as the knowledge of theories of the family and understanding the environment from which the family originates.

2. Social risk assessmentof families

Assessment of social risk rate of families is based not only on a professional judgement of the assessor, but also on the criteria of functionality of the family. However, these functional requirements on families are changing along with the social development. What was expected from the family in the past is not too important anymore. James H. Bray in this context points to the absence of definitions, related to both healthy and dynfunctional family functioning [1].

Contemporary practice shows us that different assessors use different working methods and the interpretation of social risk rate is dependent on the subjective perception of the individual assessor and on his/her working or personal experience. Selection of the evaluated areas can in practice lead to overlooking the important areas essential for family functioning and healthy development of it's members. With subjective selection of the evaluated family life areas there is also increased risk of overlooking the strong points of the family, which could be crucial for the improvement of it's functioning.

3. Systems theories

We can observe the contribution of systems theories to the process of assessing families in visualisation of important indicators of family system social risk rate. Based on the ample therapeutical practice, systems theories set up the characterictics for indicating social risk rate on various levels of the family system. It is possible to use these indicators of assessing the risk rates of families to create theoretical resources of family functionality assessment in practice.

We classify communication therapy, experiencial family therapy, strategic family therapy and structural family therapy as systems theories [2]. In accordance with Bertalanffy's theory, they regard family as an open system which maintains a homeostasis state of balance by feedback mechanisms [3]. For the purposes of theoretical analysis we extended the list of systems theories by family functioning evaluation models: The Mc Master Model of family functioning, Olson's Circumplex Model and Beavers Systems Model of family functioning.

4. Dimensions of family functioning

Based on the study of systems theories, we defined the important dimensions of the family functioning (communication, structure, family functioning) that should be included in the process of assessing families. We define the components corresponding to the individual dimensions, which shall be our basis for the description of social risk rate indicators. Social risk rate indicators (SRRI) are crucial for the evaluation of individual dimensions of the family functioning.

4.1 Communication

Components: verbal communication, non-verbal communication

Communication within family is a basic area to be evaluated throughout the process of assessing families. There are two levels of communication in interpersonal contact: verbal communication is complemented by the non-verbal communication contributing to the comprehension of the situation context.

Concurrent sending signals on both verbal and non-verbal level is present in any contact of two or more persons. The risk only arises when these signals become conflicting, thus resulting into double bind. Communication therapy uses the term "schizophrenic transaction" and paradoxical communication in connection to the families experiencing problems with sending contradictory signals [4].

Experiencial therapy points to incongruence – the discrepancy between a family member's inner experience and his/her external manifestations - in the dimension of communication [5]. Incongruent communication serves family members as a defense mechanism to conceal their fear of rejection or non-acceptance. True feelings of low self-esteem and low self-woth stay hidden from other family members owing to the incongruent communication [6].

Structural family therapy regards communication as a facilitating means. Minuchin claims that communication enables family members to define boundaries around the subsystems [7].

McMaster's model emphasises verbal level of communication and the way family members communicate with each other. It's creators do recognize the non-verbal level of communication as well; however, due to methodological difficulties connected to data acquisition, they do not take it into consideration during family evaluation process. McMaster's model sees the risk in such a type of communication that is unclear and indirect [8].

Olson's circumplex model classifies empathy, attentive listening and constructive comments as positive communicative skills. The absence of communicative skills is in it's perspective represented by excessive criticism weakening the family coherence [9].

Sustama theories	Communication		
Systems meones	Verbal	Non-verbal	
Communication therapy	schizophrenic transaction SRRI – paradoxical communication		
Experiencial family therapy	-	SRRI - low self- esteem, low self-worth	
Structural family therapy	facilitating means for restructuralisation of boundaries		
McMaster model	SRRI - unclear and indirect communication	-	
Olson model	SRRI - lack of communication skills (excessive criticism)		
Beavers model	-		

Table 1. Communication

Source:own processing

4.2 Structure

Components: boundaries, bind, power, roles

4.2.1 Boundaries

In the context of creating structure and boundaries of the family system, Experiencial family therapy refers to "rules". The rules enable family members to live in a shared space, and help to improve the quality of their living together as well. Virginia Satir points out the need to research effectivity of the family rules and whether or not they are beneficial for the family. Along with children growing up and family experiencing a transition into a new According to the Structural family therapy, the purpose of the boundaries is to protect the differentiation of the family subsystems. Minuchin describes two types of boundaries as potentially perilous: enmeshed and disengaged. In an "enmeshed" family it is necessary to strenghten the boundaries between individual subsystems and to determine the autonomy of individual members of the family. In a "disengaged" family it is decreasing the impermeability of the boundaries between family subsystems that is vital [7].

4.2.2 Bind

Communication therapy mentions bind in connection to the double bind. Basic condition of the double bind theory is long-term sending two mutually negating signals to a person, who does not know which part of the communication content he/she should react to. Paradoxically, this person is trapped in a situation when he/she would be punished no matter to which signal he/she would react. Communication therapy connects the presence of the double bind to the families in a "schizophrenic transaction". The representatives of California school in Palo Alto assumed that sending contradictory signals in a double bind relation sets conditions for developing schizophrenia and mental disorders [10].

Virginia Satir, representative of the Experiencial family therapy, had made an observation based on her therapeutical practice that disrupted families have an apprehensive, submissive and accusing bind to the society. In the case of families with healthy functioning the bind was, on the contrary, open and based on trust [5].

Structural family therapy regards a "triangulation" in the form of "rigid abuse of a child during the arguments between parents" as a bind which poses a risk [7].

4.2.3 Power

Communication therapy mentions power in the context of the communicating subjects' position. In a complementary relationship, which reflects different (hierarchic) positions of communicating subjects, a person in superior position would manifest more power. This person would take a superior position against the person with a lower position in the communication. In some cases, the person in an inferior position could fight for power in the relationship. Such an active attempt for a change in the relationship is called "manoeuvring" in terms of communication theory. Manoeuvring of an inferior is a communicative behaviour, which is used to achieve a redefinition of the relationship from complementary to a symmetrical, equal one [10].

Structural family therapy points out that generation hierarchy, where parents have bigger authority than children, is necessary for healthy functioning of the family system. Democratic family functioning lacking the leaderly subsystem represents a potential risk in the perspective of the structural therapy [7].

4.2.4 Roles

Experiencial therapy pays close attention to communication roles. Virginia Satir identifies four incongruent communication roles which family members usually resort to: placating, blaming, computing and distracing. Family members take these roles out of feeling of low self-esteem and fear to express oneself in a congruent way [5].

Structural therapy describes "parentified child" as a pathologic role. Competencies, which are delegated to a parentified child, are a source of conflicts in the family system. Pathological role of a parentified child is difficult for the child as well. The requirements imposed on the child exceed his/her abilities and conflict with the needs he/she has got as a child. Salvador Minuchin mentions that it is essential to return a parentified child into the sibling subsystem, and to put the decision-making competencies back into parents' hands [7].

Table 2 . Structure

Systems	Structure			
theories	Boundaries	Bind	Power	Roles
Communi- cation therapy	-	SRRI – sending contradictory signals	SRRI – struggle for a superior position	-
Experienci al family therapy	SRRI – effectivity of the rules	SRRI – apprehensive, submissive and accusing bind	-	SRRI - placating blaming, computi ng, distracti ng
Structural family therapy	SRRI – enmeshed or disengaged boundaries	SRRI - triangulation	SRRI – democratic power hierarchy	SRRI – parentifi ed child
McMaster model	-	-	-	-
Olson model	-	-	-	-
Beavers model	-	-	-	-

Source: own processing

4.3 Family functioning

Components: cohesion, adaptability

4.3.1 Cohesion

Structural therapy elaborated the topic of cohesion in the context of the family structure, which is either enmeshed or disengaged. Salvador Minuchin claims that people have natural sense of belonging, as wel as separetness. Family structure can thus move on a continuous axis, from an extreme of an enmeshed family to that of a disengaged one. [7].

McMaster's model in the context of cohesion examines how often and in which way family members show concern for each other. This model defines symbiotic connection and lack of connection as pathological. In the case of symbiotic connection, emotional bond between family members is so intense that it eliminates the boudaries between them. Lack of connection represents a situation, when family members just live next to each other and do not show any concern for each other [8].

Olson's circumplex model works with "curvilinear hypothesis", which assumes that high degree of family cohesion (enmeshment) as well as it's low degree (isolation) both indicate presence of a family dysfunction [11].

Beavers, similarly to Olson's model, also views family cohesion from the perspective of the curvilinear hypothesis, assuming that high and low degree of family cohesion is connected to the presence of a family dysfunction [12].

4.3.2 Adaptability

Structural therapy pays close attention to family adaptability in the connection to creation of the family system structure. Salvador Minuchin emphasizes the importance of adjusting the family structure to inner changes as well as to those caused by external influences, for healthy functioning of the family system. Inner changes are described by him as a transition of the family system to the new stage of life. This transition is linked to coming of the new family member or loss of a close relative. Salvador Minuchin points out that as the cycle of life goes on, families undergo changes and family therapy should provide them with professional help, so as to enable them to adjust to these changes. They only become pathological when they increase rigidity of the boundaries and refuse to accept new alternative rules [7].

Olson's circumplex model defines adaptability as: "the ability of marriage or family system to change it's structure, roles, relationships and rules in response to stress "[11]. As risk-posing is within Olson's circumplex model regarded extremely low level of family adaptability (rigid adaptability) with no acceptance for changes, and extremely high level of adaptability (chaotic adaptability), with the presence of dramatic role changes and lack of authoritative leadership.

When evaluating the adaptability of a family system, Beavers, unlike Olson, does not use the curvilinear hypothesis. On the contrary, he sees a linear relationship between adaptability and family system functioning, assuming, that high degree of family system flexibility is important for healthy family functioning. In other words, the more open to changes the family is and the higher degree of adaptability it shows, the more likely it is functional [12].

Table	3	Family functioning	
rable	э.	ramily functioning	

Constant The sector	Family functioning		
Systems Theories	Cohesion	Adaptability	
Communication therapy	-	-	
Experiencial family therapy	-	-	
Structural family therapy	SRRI – too close relationships (enmeshed family) or indifferent relationships (disengaged family)	SRRI – increasing rigidity of the boundaries	
McMaster model	SRRI – symbiotic connection, lack of connection	-	
Olson model	SRRI – high degree of cohesion (enmeshment) low degree (isolation) (curvilinear hypothesis)	SRRI – too little or too many changes (curvilinear hypothesis)	
Beavers model	SRRI – high or low degree of cohesion (curvilinear hypothesis)	SRRI – low degree of adaptability (linear hypothesis)	

Source:own processing

5. Conclusion

Communication, boundaries, bind, power, roles, adaptability and cohesion are the basic components to focus on during the assessing process. It is possible to evaluate family system functionality rate based on observations of family relations, power distribution and roles taken by family members. Final list of dimensions and components needs to be extended and completed, so that it can fulfill the requirements of practice. Theoretical analysis of social risk rate indicators based on selected systemic theories is a first step towards creation of an assessment framework for the process of assessing families.

Assessment framework would reduce the potential risk of developing low level of conceptional skills of the assessors, and limit the creation of subjective assessment methods as well. At the same time, it would increase the legitimity of the decisions that the assessors came to by evaluation of the family system functioning. Should there be any doubts about correctness of the interventions to be performed, formal assessment framework would enable retroactive clarification of the social risk rate of families and thus reduce the apprehension concerning maintaining the neutral attitude and assessor's objectivity. Systemic theories are crucial for creation of theoretical basis of the assessment framework. When working with family system, they focus on risk-posing attributes of the family functioning and provide ample conceptual basis for the evaluation process.

References

[1] Bray J., Family Relations, Vol. 44, No. 4, pp. 469-477,1995

[2] Prochaska, J. O. - Norcross, J. C. *Psychoterapeutické* systémy – průřez teoriemi. Praha : Grada Publishing, 1999, 480 s.

[3] Jonesová E. 1993. *Terapie rodinných systémú. Vývoj v milánských systemických terapiích*. Hradec Králové: Konfrontace, 1993, 207 s.

[4] Gabura, J., *Komunikácia pre pomáhajúce profesie* Vydavateľstvo: Univerzita Komenského,2010, 196 s.

[5] Satirová, V., Kniha o rodine, Vydavateľstvo: Institut Virginie Satirové, 1944, 349s.

[6] Rasheed, J. - Marley, J. *Family therapy: Models and techniques*. SAGE Publications, Inc. 2011. 536 s.

[7] Minuchin, S. Rodina a rodinná terapie, Praha: Portál, 2003, 232 s.

[8] Epstein, B. - Bishop, D. - Levin, S., *Journal of marriage and family counseling*. Vol. 40, pp. 19-31, 1978.
[9] Olson, D. *Journal of marital and family therapy*. Vol

3., No. 1, pp. 64-80, 2011

[10] Haley, J. *Strategies of psychotherapy*. New York: Grune and Stratton Inc., 1963, 203p.

[11] Olson, D. - Russel, C. - Sprenkle D., Journal of marriage and family. Vol. 42, No. 4, pp. 973-993. 1980

[12] Beavers, R. - Hampson, R., *Journal of family therapy*. Vol. 22, p. 128 – 143. 2000

CRE-ACTIVE YOUTH PROMOTING CULTURAL HERITAGE FOR TOMORROW

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Abstract: The term conservation includes complex and differentiated valorisation activities of the cultural and natural heritage which link the past to the present. So do young people, bridging the past, the present and the future. This paper presents some examples of projects based on creative access for young people enabling them to be active contributors in the conservation and promotion of cultural heritage creatively, fostering volunteer work as well as new ways of employability. It focuses on the added value youth participation can offer at the individual (sense of accountability, active civic engagement, identity and competences building) and societal level (inter-cultural and inter-generational dialogue, appreciation of cultural differences, youth-friendly innovations).

Keywords: heritage, degradation, conservation, youth participation, volunteer.

1. Introduction

According to the Convention Concerning the Protection of the World Cultural and Natural Heritage [1], the cultural heritage is the legacy of physical artifacts (monuments, groups of buildings and sites) and intangible attributes of a group or society which are of outstanding universal value from the point of view of history, art, science, aesthetic, ethnology and/or anthropology. It provides testimonies to, and links between the past and the present [2].

The state of conservation of many very old important cultural objectives is impacted not only by the environment aggressiveness, but also by domestic and industrial activities, and by the cultural and environmental education level of people. Over time deterioration and degradation processes can affect the physical, structural and functional state of artifacts leading to the partial or complete deletion of the messages they convey. These processes can be grouped into [3] natural deterioration/degradation - caused by the action of climatic factors, normal physical, chemical and biological factors, or natural disasters (earthquakes, volcanic eruptions, floods, lightning, etc.) and, conscious (anthropogenic) deterioration/degradation - caused out of ignorance, negligence, carelessness or inattention by anthropogenic catastrophes, such as vandalism (due to war, fanaticism, architects and developers, large-scale tourism and people's inappropriate behaviours based on educational deficiencies, etc.) [4].

To stop and prevent these processes, as well as to valorise the cultural heritage and to preserve its historical messages from the past for the future generations it is necessary to intervene efficiently and effectively with conservation processes. In a broad sense, the term conservation includes investigation/research activities, preservation, restoration, valorisation and hoarding [3, 5].

Adopting a participatory approach, community members can be motivated to redefine their individual roles and responsibilities consciously, voluntarily and creatively [1, 6, 7], taking an active stand in the conservation processes of cultural heritage.

2. Volunteering for cultural heritage

The European Union since many years and especially in 2011 (the European Year of Volunteering) engaged local administration representatives responsible for cultural and educational policies, trainers from public and private structures, cultural associations and non-governmental organizations in actions promoting (young) citizens' (active) participation.

In 2012 the Volunteer Service Center Tuscany (ServiziVolontariato Toscana) - Cesvot from Italy and Promo P.A. Foundation issued The Magna Charta of volunteering for cultural heritage (La Magna Charta del volontariato per i beniculturali) and Guide to the use of voluntary informed (Guidaall'uso del volontarioinformato) aiming to create practical guides and framework for recognition, scheduling and organization of the volunteer work in cultural heritage [8].

In the same direction, the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions has presented in 2014 an integrated approach to cultural heritage for Europe, stating that cultural heritage as a shared resource and a common good offers important educational and volunteering opportunities for young people beside promoting intercultural and inter-generational dialogue [9].

At the present young people across the world are increasingly involved in cultural heritage preservation, valorisation and promotion [2] and their participation is based on cultural rights to access and participate freely in cultural life, to express their views on all matters affecting them and to participate in the cultural life of the community, developing and sharing knowledge and cultural expressions [10, 11].

Enabling youth to contribute with their participation to the promotion of cultural heritage in creative and innovative ways has many benefits: it strengthens one's sense of identity and belonging, supports personal development of potentials, resources and competences (individual wellbeing) as well as active citizenship (civic engagement) and inclusion in the (trans)cultural communities and in the (multicultural - intercultural) society (societal well-being). Youth are a bridge between past, present and future generations and key agents in promoting heritage values that can favour intercultural understanding and respect for cultural diversity [2].

Considering the fact that young people represent the 25% of the world's population, involving them in the cultural heritage conservation means to develop attitudes and practices based on transmitting and promoting civic, cultural and participatory values such as [2, 12, 13]: respect for history and cultural diversity, loyalty, honesty, intercultural understanding of the social usage of cultural property and its preservation, teamwork and accessibility – equal rights and opportunities for informed engagement (access and participation) in the cultural life of a community, responsibility and voluntary participation and transparent dialogue.

These values, promoted in connection with new technological developments, have stimulated new ways of interpreting knowledge, a better understanding of the importance of both tangible (monuments, historical centers, natural reserves, etc.) and intangible heritage (traditional know-how, music, literature, etc.). By exploiting the benefits of online information and internet access, skills development training courses are also being integrated, whenever possible, into the agenda of youth forums, teacher-training seminars, workshops and volunteer action camps [14].

The World Heritage Education Programme of United Nations Educational, Scientific and Cultural Organization (UNESCO) strives to involve youth with many different projects and activities such as Youth Forums, skills development training courses, educative workshops and seminars, the World Heritage Volunteer Programme and its main tool, the World Heritage in Young Hands, an educational resource kit for school teachers, existing in 37 national language versions that has reached at least one million young students [15].

2.1Creative involvement of young people

Engaging youth through volunteer work, employment and local entrepreneurship, recreational, and educational (and training) initiatives is vital for achieving sustainable, whole-community (pro-active and citizen-centered) and long-term development with partnerships between different stakeholders and actors, between non-profit and for-profit organizations [16].

Several projects can be mentioned as good examples regarding involvement of young people directly both as target group and giving them active roles recognizing them as resources and added value.

At a broad, international level, the World Heritage Volunteers initiative launched in 2008 to mobilize young people and youth organizations in World Heritage preservation and promotion consists of awareness raising youth action camps, involved so far over 2000 national and international volunteer participants [17].

Neighbouring countries also do cooperate. The project Living Fountains - Reviving Water Wells and Ponds, implemented within the 2007-2013 Slovenia-Italy Cross-Border Cooperation Programme, for example, envisaged the restoration and arrangement of 32 water wells and ponds as monuments of cultural heritage shared in the cross-border Karst area. It involved active participation of pupils from primary and lower secondary schools in creating material on the cultural and historical value of water wells, educational trails and revive events (with poetry, art, concerts, etc.) linked to the historical aspect of the cultural heritage represented by water wells [18].

At the national and local level involvement of youth in cultural heritage promotion is also vital, like for instance in developing countries, such as Albania, where youth, despite being a large portion of the society, often feel excluded from most of the political and societal processes. They face various challenges, such as unemployment, mobility issues, lack of updated educational resources, low living standards, corruption, juvenile delinquency, lack of consistent youth policies or programs to allow them participation [19]. Joint efforts of local and national organizations to raise awareness of youth civic engagement in cultural heritage protection are often successful in obtaining benefits for the youngsters and for the society.

The Ministry of Culture in Albania, for instance, lately aims to build a network called Friends of Cultural Heritage [20],involving 166 primary and secondary national schools to volounteer in maintaining heritage objects, on one hand saving on employed staff members in times of general economic crisis, on the other hand enhacing youngsters' accountability and contribution to the cultural heritage as they are themselves engaged in identification, protection, preservation and promotion of heritage buildings and cultural monuments in the vicinity of their schools.

Another project, titled From Gjirokastar, Made in Gjirokastra [19], aims to encourage young people toward cultural heritage market of artcrafts products for their permanent employment. The City of Gjirokastra promotes the development of youngsters' creative skills by supporting their employment in the field of cultural heritage and the production of souvenirs for the tourist market.

The Cultural Heritage Without Borders Regional Restoration Camps [21], winner of a 2014 European Union Prize for Cultural Heritage / Europa Nostra Award in the category of "Education, Training and Awareness-Raising", represent another simple and successful training model, which developed and grew from a few national students in 2007 to multiple sessions in four countries in 2013, with a diverse array of participants in the Western Balkans. The main objectives were to use cultural heritage to build relations among young professionals, creating conditions for reconciliation as a prerequisite for peace and democracy, and to preserve traditional crafts and techniques.

3. Conclusions

The short paper presented some examples of projects having young people actively contributing to the promotion and preservation of cultural heritage to future generations at local, national, cross-border and international levels.

The young creative generation is increasingly becoming a resource for amelioration. Youth and creativity (including innovation to create youth-friendly accessible resources and methodologies) are valuable sources of help in actively overcoming challenges related to cultural heritage preservation, valorisation and promotion and challenges related to the general societal and economic challenges, promoting inclusive and sustainable growth.

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References

[1] United Nations Educational, Scientific and Cultural Organization, *Convention Concerning the Protection of the World Cultural and Natural Heritage*, Paris, 1972 (http://whc.unesco.org/en/conventiontext/)

[2] http://www.un.org/esa/socdev/documents/youth/fact-sheets/youth-cultureasavector.pdf

[3] Perusini, Giuseppina, *Il restauro dei dipinti e delle sculture lignee. Storia, teorie e tecniche*, Udine, Del Bianco Editore, 2004, p. 99

[4] Benarie, Michel, *Vandalism and cultural heritage*, European Cultural Heritage, Newsletter on Research, Vol. 2, No. 2, pp. 3–6, 1988

[5] Sandu, Ion, Aspecte interdisciplinare ale ştiinţei conservării patrimoniului cultural, Catalogue EUROINVENT International Workshop 2013, Iaşi, Editura Universității Alexandru Ioan Cuza, 2013, pp. 67– 93

[6] Bass, Stephen, Dalal-Clayton, Barry, Pretty, Jules, *Participation in strategies for sustainable development*, Environmental Planning, No. 7, International Institute for Environment and Development, London, United Kingdom, pp. 118, 1995

[7] Brown, Nicole A. (coordinator), *A Guide to Teaching Participatory and Collaborative Approaches to Natural Resource Management*, St. Lucia, USA, Caribbean Natural Resources Institute (CANARI), 1999

(http://www.canari.org/267guide.pdf).

[8] Velani, Francesca, Rosati, Claudio (editors), *La magna charta del volontariato per i beni culturali. Dal progetto alla convenzione tipo*, Firenze, Centro Servizi Volontariato Toscana, 2012, p. 15

[9] European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions*,

(http://ec.europa.eu/culture/library/publications/2014heritage-communication_en.pdf)

[10] Fribourg Group (Editor), Cultural Rights. Fribourg Declaration, 2000, Fribourg, p. 6

(https://www1.umn.edu/humanrts/instree/Fribourg%20Dec laration.pdf)

[11] http://www.coe.int/t/dg3/children/participation/CRC-C-GC-12.pdf

[12] United Nations Population Fund, Marshall Alex (editor), *Generation of Change: Young People and Culture. State of world population 2008. Youth supplement*,

https://www.unfpa.org/webdav/site/global/shared/documen ts/publications/2008/swp_youth_08_eng.pdf

[13] Watson, Steve, Waterton, Emma, Heritage *Community Engagement*, International Journal of Heritage Studies, Vol. 16, No. 1–2, pp. 1–3, 2010

[14] National Museum Directors' Conference, *Museums* and galleries: Creative engagement, 2004, London, Science Museum and dsprint / redesign.

[15] http://whc.unesco.org/en/educationkit/

[16] Duxbury, Nancy, Campbell Heather, *Developing and Revitalizing Rural Communities through Arts and Culture*, Small Cities Imprint, Vol. 3, No. 1, pp. 111–122, 2011

[17] United Nations Educational, Scientific and Cultural Organization, *World Heritage Education Brochure*, http://whc.unesco.org/en/wheducation/pg3-4.

[18] Living Fountains Project, www.livingfountains.eu

[19] Blerina, Gjeka, Volunteerism Perceptions and Realities in the Albanian Youth Sector, United Nations Volunteers, 2009, p. 19

[20] Ministria e Kulturës, Raport publik për 300 ditët e para, 2014

(http://www.kultura.gov.al/files/news_files/Raporti_300_d itet_Print_min_kultures.pdf)

[21] Cultural Heritage Without Borders, *Regional Restoration Camps*, http://chwb.org/albania/activities/rrc

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