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4

2014
issue 1

AD ALTA

Journal of Interdisciplinary Research

AD ALTA: Journal of Interdisciplinary Research

Double-Blind Peer-Reviewed

Volume 4, Issue 1, 2014

Number of issues per year: 2

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MAGNANIMITAS Assn.

AD ALTA: JOURNAL OF INTERDISCIPLINARY RESEARCH

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ADDRESS: CESKOSLOVENSKE ARMADY 300, 500 03, HRADEC KRALOVE, THE CZECH REPUBLIC, TEL.: 498 651 292, EMAIL: INFO@MAGNANIMITAS.CZ

ETTN 072-11-00001-01-4

ISSN 1804-7890

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2 ISSUES PER VOLUME.

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HOLISTIC COMPETENCE OF MANAGERS AS A PREREQUISITE FOR SUCCESSFUL CREATION OF CRISIS PLANS

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Abstract: The article focuses on contingency planning for the company as an integral part of the company management. The authors are trying to look at this is me holistically and as a major factor responsible for creation of contingency plans the authors perceive holistic competence (social maturity, the expertise and skill applications) of the manager in relation to the requirements of holistic competence of members of the management. Only then it is possible to carry out a thorough analysis, risk identification, and set the relevant crisis scenarios. Problems of crisis are based on the research, which was carried out, aiming to evaluate who and how participates in companies operating in the Czech Republic in the creation and the use of contingency planning. The research questions were directed to the area of emergency planning and to the requirements for persons who is responsible of implementing these contingency plans.

Keywords: Holistic Competence, Crisis Manager, Crisis Management, Risk, Crisis Plan

1 Contingency planning of an enterprise

Generally speaking, management can be defined as a coherent system of interrelated actions and activities that lead to the achievement of organizational goals. These basic activities include decision making, planning, organization, control. Generally, management can be defined as a coherent system of interrelated actions and activities that leads to the achievement of organizational goals. The basic activities of management include decision making, planning, organization and control in the most general terms. Management, however, is also widely seen as a multidisciplinary science, based on the findings of many other social, natural and technical sciences. An integral component of the application of management consists of the knowledge of management practice. The key is the management person, mostly middle management, in collaboration with the senior management of the company in the process of enterprise crisis management plans, implementation, monitoring and sustainability. Holistic management, which is characterized by its holistic, i.e. a holistic approach to a wide range of knowledge deals with management entities and their character - competence within its multidisciplinary. As a consequence it follows that the holistic management is based on a systems approach, which is based on a comprehensive understanding of the phenomenon - in its internal and external contexts (Vagner , 2004). These ideas are not the achal discovery of our time, but they were mentioned and methodologically elaborated for example, in 1968, by Ludwig Bertalanffy in the publication General System Theory (Porvazník, 2011).

Planning is a very important part of the procedure as it belongs to the most important means to achieve organizational goals and consequently the prosperity of the whole enterprise depends on its level. Planning can be seen as a decision-making process involving the setting of objectives, selection of appropriate means and methods of their achievement and the expected results defined in the allotted time. Similarly, the definition can also be applied to the risk management and the creation of contingency plans of the enterprise.

In the current era of globalization and turbulence of the business environment crisis management should form an integral part of the integral management of the enterprise. Crisis management is an area of enterprise management, focusing on analysis and risk reduction using various methods and techniques of risk prevention that eliminates existing or future factors revealing the increasing risk. Risk management is a systematic, repetitive set of interrelated activities, which aim to manage the potential risks thus reduce the likelihood of their occurrence or reduce their impact. The purpose of risk management is to avoid any problems or negative phenomena, avoid crisis management and avoid problems. Risk management consists of four interrelated phases: namely risk analysis, risk assessment, managing risk (or

mitigation) and monitoring of risks as a key risk analysis we see that risk analysis is a team activity. The staff team should be competent to perform this strategic activity for the company, not only in the area of training (the emphasis is usually placed on particular knowledge of methods applicable for risk analysis), but also in the area of application and personality. Only then this activity can be successful for the enterprise consuming a lot of sources. The severity of this matter has been neglected so far not only in business practice, but also especially in looking at the issue of entities (persons who come into contact with crisis planning) management. In this context, the application of Porvazník holistic model of management competence seems desirable. This approach consists of three pillars synergistically effecting each other: the pillar of social maturity, the pillar of application skills and the pillar of expertise knowledge, as shown in Figure 1.

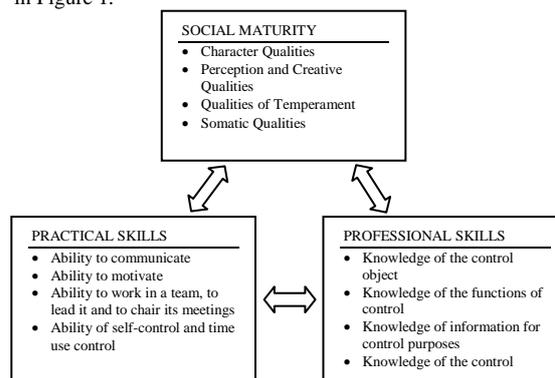


Fig. 1: Model of holistic management competency (Porvazník, 2008)

A holistic competent manager (even an owner, an employee) is the one that has the necessary expertise knowledge (the necessary level of competence knowledge, IQ, the necessary social (human) properties (necessary level of social intelligence SQ) and the necessary practical skills (necessary level of practical, executive capabilities, free intelligence AQ). (Porvazník, 2011, p. 39) The concept of the model in Figure 1 is based on Porvazník's belief that hierarchy, of above mentioned three pillars, the pillar of social maturity occupies the most important position, in terms of absolute necessity of existence of the individual building blocks of this pillar lies in the personality of a manager (not only) in his successful managerial practice. This fact is often overlooked in corporate practice and the emphasis is on professional ability. A professional can be regarded as a person who has the required knowledge and who can practically apply this knowledge in practice. It is necessary , however, to perceive the difference between a specialist who has the necessary knowledge , but applies the knowledge to his/her advantage, while not hesitating to violate any rules (legal, safety, ethical, humane or moral) and professional, who depends on the success, prosperity, sustainability, safety and growth of his/her team or the entire company.

The reality of the state of human society in general supports Porvazník's view on the bodies of the management. It is primarily the presence of personality traits of management persons, which are generally made up of their character traits and desirable properties, volitional (willed), creative (creative) and cognitive (cognitive), their temperament, emotional and psychosomatic characteristics. (Porvazník, 2013). Tasks related to crisis planning in the company are usually initiated by determining the level of severity and the probability of occurrence of each risk on the basis of which risk assessments had been defined by the team.

With the determination of the level of severity and probability of occurrence of each risk we can evaluate the risk of pre-defined team. The following is a creation of crisis scenarios and plans, monitoring the success of the introduction of instruments for elimination and risk management. The authors perceive as the basic function of reducing the risk of a crisis plan and guidance on how to respond and solve the crisis. Therefore there should be placed the greatest emphasis from the point of a risk management of an enterprise. Smejkal and Rais define (2010) emergency plan as a set of procedures for dealing with specific anticipated events that are evaluated on the basis of the risk analysis. The guidelines for each event determine the objective to be achieved, the sequence of decisions and interventions to be implemented in case of an event and report data that allow you to make these decisions and actions. Decisions and actions are for each event, which will be prepared in an emergency plan, gradually sorted in chronological order.

Coombs (1999) draws our attention to detail and also the applicability of the emergency plan. Crisis plan must contain all the information that is necessary to cope with the crisis, but it would be a very long and complex document. The value of crisis plan lies in its ability to create a reaction. Basically, it is a communication document as an emergency plan that identifies persons who should be contacted in case of need and shows how the contact should occur. Some experts call the emergency plan simply a communication plan. Preferably, the chosen terminology for this type of crisis is a crisis plan document as crisis communication plan consists of only one part of the emergency plan.

There are three basic tasks of emergency planning:

- 1) Emergency plans for crisis managers to provide exceptional legal and administrative powers to take actions, it is necessary within individual organizations that these powers were enshrined in the relevant internal rules - i.e. so-called crisis and emergency plans.
 - 2) Contingency plans provide guidance for the implementation of appropriate emergency interventions
 - 3) Emergency plans appoint systems to help crisis managers to mitigate the effects of emergencies and help prevent that the emergency event might grow into a crisis or series of crises.
- The crisis plan is a living organism that must be constantly monitored, maintained in usable condition, audited, trained and practised. In a crisis plan other procedures are gradually added for further expected events, which are assessed on the basis of changing conditions, social situation, development - ie on a basis of permanent risk analysis.

2 Research methodology

In the period from February to April 2014 research was carried out. This research had been assigned as a part of semester work of a study program of the students from the third grade studying Risk Control. Students received a questionnaire created by the authors and filled out these questionnaires with the management of an enterprise where they work. This method of questioning brought not only a great feedback, personal approach on behalf of the enterprise, but also deepened the research in the form of qualitative research. The authors evaluated this form as far more efficient than when conventional electronic polling, the average return is from 10 up to 30 %. All 96 returned questionnaires were entered. Students who were between jobs or on a maternity leave were asked to choose a company in their surrounding area and interview the owner or senior employee to fill out the form. The aim of this research was to evaluate the use of contingency planning in enterprises in the Czech Republic. Questions were directed to the area of emergency planning and requirements for persons who make up contingency plans.

3 Research results

We have chosen classification according to the Commission Regulation EC No.800/2008 for the selection of enterprises due to their size, a specific criterion number of employees. The

selection of organizations, that returned questionnaires, is following:

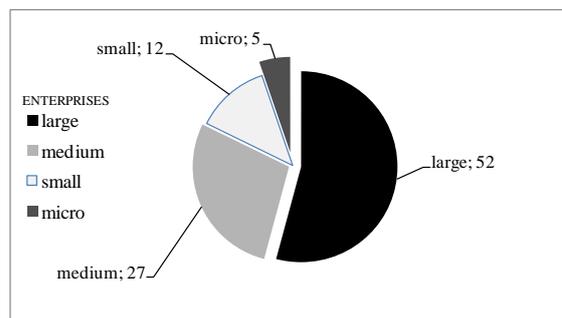


Fig. 2: The Selection of the research sample by enterprises size (Author's Elaboration)

Another key feature of the present research was the area of business in which the organization operates. There was a choice of these sectors of the economy: risk management will have a greater use in areas with a higher probability of type risks which are: manufacturing, technical, environmental, chemical etc. 59 % of the responses from managers in the industry out of the total number of returned questionnaires, the second largest group with representation of 26 % was trade and services. Representation in various business areas is presented in the following figure.

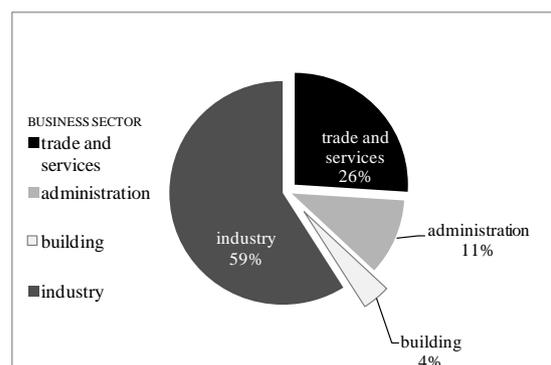


Fig. 3: Representation of the sample within the business sector (Author's Elaboration)

Other questions had been directed to the field of emergency planning and requirements for persons who undertake the emergency planning in the business. 91 % of managers responded positively to the question whether contingency planning is carried out by the organization, ie, that contingency planning does not take place only in 8 organizations. The following table shows what kind of contingency planning activities are in individual companies according to the size most commonly (in the table there are the answers of individual managers for selected activities of contingency planning).

Tab.1: Activities of contingency planning

	Micro enterprise	Small enterprise	Medium enterprise	Large enterprise
document processing according to the guidelines and standards		4	15	42
processing of plans against flood and fire			7	3
identification of risks via controlled discussion				9
drilling and simulation				6
training				2

The table shows that contingency planning is done primarily in large enterprises and includes a variety of activities. Medium-sized enterprises spend less time with contingency planning, small and micro businesses not at all. The following figure shows who implements creating contingency plans in enterprises

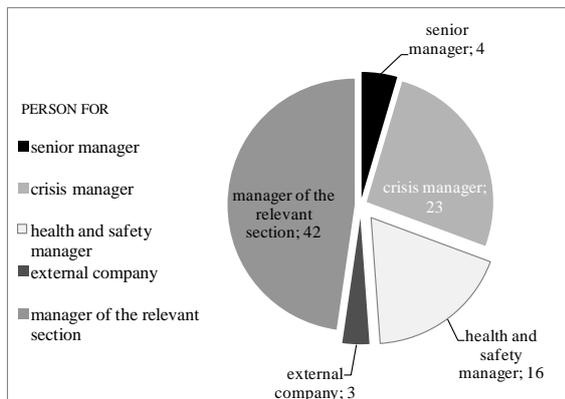
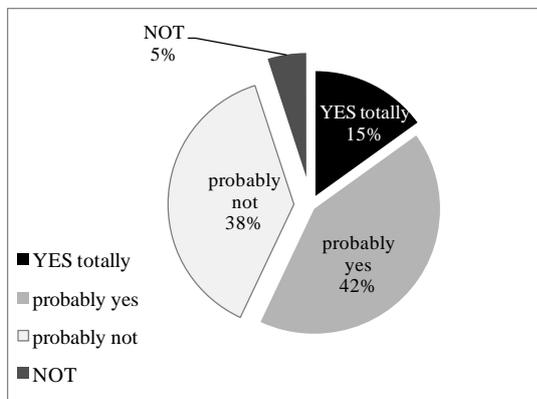


Fig. 4: Person for contingency plans (Author's Elaboration)

The research showed that contingency planning is done in medium-sized enterprises, and mostly in the large enterprises. This fact also corresponds with the query who is in charge of emergency planning. It can be assumed that an independent department of emergency management or the manager of the department carry the assessment of risk and the creation of contingency plans by themselves in a truly large enterprises. The last question was directed to the requirements in terms of holistic competence (expertise, application skills, social maturity) that are imposed on persons who are engaged in risk management and creating contingency plans. The resulting response is in a figure 5.

Fig. 5: Requirements of contingency plans (Author's Elaboration)



The results of the questionnaire research showed that crisis planning is a current part of responsible management approach of companies operating in the Czech Republic.

Within the categorization of companies according to the European standards, the research is conducted predominantly by large and medium-sized enterprises. According to the study, small businesses and micro enterprises do not form contingency plans at all, which can be described as a lack of great significance and importance, since this type of businesses is considerably less immune to the external and internal risks than large or medium-sized enterprises.

In companies where they deal with crisis planning, this crisis planning belongs to the job competency of crisis managers (a crisis manager post is mostly in large enterprises) or the managers of particular department of the company. Therefore we

can conclude that risk management is an essential part of management at all levels.

Persons who carry out contingency planning have to meet considerable demands on their expertise, application ability and personal maturity, which corresponds to Porvazník's concept of holistic competence of managers and the accountability in the context of whole enterprises with the principles of holistic management. The research, which was carried out, can be considered as a pilot research, as the authors aim to analyze the application of holistic competence of managers in the risk management process in the context of further research.

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Primary Paper Section: A

Secondary Paper Section: AE

PASSIVE PORTFOLIO MANAGEMENT BASED ON QUADRATIC INDEX TRACKING

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The paper is prepared under the aegis of the grant scheme VEGA No. 1/0765/12 Research into possibilities and perspectives of employing traditional and alternative approaches in financial management and financial decision-making in the changing economic environment. Its preparation is also due to a partial fulfilment of the Operational Program Education project ITMS 26110230082 Mobility – Support of Science, Research and Education at Matej Bel University in Banská Bystrica (Mobility – podpora vedy, výskumu a vzdelávania na UMB) co-financed by the European Social Fund within the bounds of financial subsidy contract No. 018/2012/1.2/OPV.

Abstract: Strategies of passive management in portfolio selection are based on imitating the performance of a specific benchmark (that is designed in such a way that it approximates as best as possible the value of the market portfolio) with the intention of achieving minimum discrepancy between the benchmark performance and the tracking portfolio performance. In the paper attention is given to portfolio selection based on partial replication of the S&P 500 Index. In contrast to the traditional Markowitzian approach, the key criterion of portfolio selection is minimization of the quadratic tracking error variance. In the empirical exercise, out of the stocks represented in the S&P 500 Index one stock was chosen randomly by each of the 10 GICS sectors and this selection of 10 stocks were available for portfolio selection. On the scale of performance, the quadratic index tracking strategy can be seen superior to the traditional Markowitzian approach.

Keywords: Passive portfolio management. Quadratic index tracking. Tracking portfolio. Tracking error.

1 Introduction

There are various approaches to portfolio selection and two broad classes can be singled out, active asset management and passive asset management. Procedures that are practised under the active approach embrace the well-known Markowitzian approach and are generally well known. On the other hand, passive active management is based on replicating a suitably chosen benchmark, usually a financial index, and under this course, portfolio selection is based on minimizing the discrepancy between the portfolio returns and the benchmark returns. Any strategy aiming at the replication of the underlying financial index is addressed as index tracking. Several approaches to index tracking have been devised and one of them, quadratic index tracking, is expounded in the paper. After a short theoretical outline, the expository topics are demonstrated in an empirical exercise. In this exercise, four random selections of ten assets represented in the S&P 500 Index are made in a stratified way so that each sector of the GICS classification is represented by one respective asset. For each selection, a total of five portfolios are constructed for the purpose of comparison. This comparison involves juxtaposing the quadratic index tracking strategy, in two variants, to the traditional Markowitzian approach, in two variants, and evaluating the results with respect to the performance of the underlying S&P 500 Index. The empirical exercise is designed so as to highlight and demonstrate some properties of the quadratic index tracking strategy as compared to the traditional Markowitzian approach. Its results are interesting for the investor. All though the quadratic index tracking strategy proves insufficient to guarantee that the benchmarked index is outperformed nor it can be deemed universally preferable than the traditional Markowitzian approach; if performance is defined in terms of the relation between mean return and standard deviation, it eventually delivers higher performance.

Save the introduction and the conclusion, the core of the paper consists of three sections. The section that follows is a short presentation on the traditional Markowitzian approach and is appended by theoretical exposition of the quadratic tracking error in the other section. The final section explains the design of the empirical exercise and shows its results.

1 Markowitzian approach

In the approach of Markowitz, the rational investor balances the expected return and the risk of his portfolio exposition. This may

be easily put in the words of Markowitz (1952, p. 79): “There is a rule which implies both that the investor should diversify and that he should maximize expected return. The rule states that the investor does (or should) diversify his funds among all those securities which give maximum expected return.” To set up this considerations in practice, some framework is needed. To this end, it is assumed that the portfolio of the investor is to be created of k risky assets. Suppose that these k risky asset returns are represented by a random vector $\xi = (\xi_1, \dots, \xi_k)'$ that have an expectation $\mu = (\mu_1, \dots, \mu_k)'$ and an $k \times k$ covariance matrix $\Sigma = (\Sigma_{ij})_{k \times k}$ (the diagonal elements Σ_{ii} are variances σ_i^2 of individual returns and non-diagonal elements are respective covariances). Assume for now that the both the expectation μ and the covariance matrix Σ are known. Any portfolio Π with a set of k weights $\omega = (\omega_1, \dots, \omega_k)'$ that decide allocation of available financial funds across individual risky assets has expected return $\omega' \mu$ and variance $\omega' \Sigma \omega$. If the investor desires the expected return μ_0 (at least), he would pursue a two-step optimization program. In the first step, he would determine the weights of the portfolio with the expectation μ_0 and a minimum variance by solving the following task,

$$\min_{\omega \in \mathbb{R}^k} \omega' \Sigma \omega \quad \text{subject to } \omega' \mathbf{1} = 1 \quad \& \quad \omega' \mu = \mu_0 \quad (1)$$

Let σ_0^2 denote the variance that is delivered by the optimal solution of the first step. The investor would then see that at the level of risk expressed by σ_0^2 there exists no portfolio whose expectation is possibly higher than the desired expectation μ_0 . This would be facilitated by the somewhat reversed optimization,

$$\max_{\omega \in \mathbb{R}^k} \omega' \mu \quad \text{subject to } \omega' \mathbf{1} = 1 \quad \& \quad \omega' \Sigma \omega = \sigma_0^2. \quad (2)$$

It is frequently the case that this formulation of the optimization task is extended by the short selling restriction.

In practice, however, quantities μ and Σ are not known and must be substituted by their respective estimates. Ordinarily, the expectation vector μ is estimated by simple averaging of individual historical asset returns and an estimate of the covariance matrix Σ is produced by a traditional unbiased estimator. Since these estimators are well known and used by default, their description is omitted in the paper. This is called here as the “classical approach”. As an alternative to this, these inputs may be estimated by some robust procedure. In the paper, they are estimated by the fast Minimum Covariance Determinant (MCD) estimator proposed by Rousseeuw and van Driessen (1999). This approach is addressed as the “robust (MCD) approach”.

2 Quadratic tracking error

No probabilistic framework is made use of here, just a sample of historical observations on returns computed for the benchmark as well as for the risky assets whose portfolio is to mimic the benchmark are employed as an input. In this, assume that a history of T historical observations of logarithmic returns is available and that the tracking portfolio is to be composed of k assets. Let $\mathbf{Y} = (Y_1, \dots, Y_T)'$ denote a $(T \times 1)$ vector of benchmark returns, and $\mathbf{X} = (\mathbf{x}_1 | \dots | \mathbf{x}_T)'$ denote a $(T \times k)$ matrix of returns of the k assets that are to be represented in the tracking portfolio. The symbol ω stands for a $(k \times 1)$ vector of unknown portfolio weights that are obtained by minimizing the following quadratic optimization problem

$$\min_{\omega \in \mathbb{R}^k} (\mathbf{Y} - \mathbf{X} \omega)' (\mathbf{Y} - \mathbf{X} \omega) \quad \text{subject to } \omega' \mathbf{1}' = 1, \quad (3)$$

in which $\mathbf{1}$ is a $(k \times 1)$ vector of ones. This general formulation of the optimization task allows an extension and can be complemented by the constraint banning short sales.

This initial (and somewhat traditional) quadratic programming approach to portfolio tracking is one way to determine the

tracking portfolio. Its slight modification gives another possibility of finding (an estimate of) the vector ω . The program in (3) can be restated as an ordinary least squares (OLS) problem. Minimizing the sum of squares of portfolio tracking error deviations is equivalent to running an OLS regression of benchmark returns on individual asset returns to be represented in the tracking portfolio. In this formulation of a regression without intercept, regression coefficients are portfolio weights and residuals form tracking errors.

To this end, the constraint $\omega'1$ is dropped for a while. Writing a $(T \times 1)$ vector of tracking errors as ϵ (with $\epsilon := Y - X\omega$) and assuming that X is of full column rank, it is evident that the problem can be well expressed via a regression model

$$Y = X\omega - \epsilon \quad (4)$$

and that the objective function is minimized for

$$\bar{\omega} \equiv (X'X)^{-1}X'Y. \quad (5)$$

In order to obtain the final weights ω , the OLS weights $\bar{\omega}$ are then normalized so as to sum to one, i.e.

$$\omega = \bar{\omega}/\bar{\omega}'1. \quad (6)$$

The quantity $\epsilon'\epsilon$ is sometimes inaptly called tracking error variance, but it is merely a tracking error measure in quadratic portfolio tracking. In fact, as a quadratic tracking error measure

an alternative and interpretationally easier quantity TEM_{QUAD} comparable to a standard deviation might be employed,

$$TEM_{QUAD} = \sqrt{\frac{1}{T} \sum_{t=1}^{T-1} (Y_t - \bar{\omega}'x_t)^2}. \quad (7)$$

This measure is a non-central measure and is thus influenced not only by random positive or negative deviations but also by a possible underperformance or outperformance relative to the benchmark. Estimates produced by estimator (5) are attractive in a statistical sense as this estimator is a best linear unbiased estimator in model (4).

Theoretical details and a further exposition on these issues may be found in Rudolf, Wolter and Zimmermann (1999) or in Prigent (2007).

3 Empirical Exercise

In the empirical exercise, out of the stocks represented in the S&P 500 Index one stock was chosen randomly by each of the 10 GICS sectors and this selection of 10 stocks were available for portfolio selection. This was repeated four times. The four samples of these stocks is displayed in Table 1. It was without design that these samples do not overlap and not stock is repeated in a different sample.

Table 1. The stocks participating in the empirical exercise

GICS sector	SELECTION 1	SELECTION 2	SELECTION 3	SELECTION 4
Consumer Discretionary	Starbucks Corp. (SBUX)	Carnival Corp. (CCL)	Penney (J.C.) (JCP)	Amazon.com Inc (AMZN)
Consumer Staples	Reynolds American Inc. (RAI)	McCormick & Co (MKC)	General Mills (GIS)	Kimberly-Clark (KMB)
Energy	Alpha Natural Resources (ANR)	Occidental Petroleum (OXY)	Noble Corp (NE)	Marathon Oil Corp. (MRO)
Financial	SLM Corporation (SLM)	Berkshire Hathaway (BKR.B)	Vornado Realty Trust (VNO)	Regions Financial Corp. (RF)
Health Care	Merck & Co. (MRK)	BIOGEN IDEC Inc (BIIB)	Cardinal Health Inc. (CAH)	Allergan Inc (AGN)
Industrials	Joy Global Inc. (JOY)	Varian Medical Systems (VAR)	General Electric (GE)	CSX Corp (CSX)
Information Technology	Teradata Corp. (TDC)	Akamai Technologies Inc (AKAM)	TE Connectivity Ltd. (TEL)	Xilinx Inc (XLNX)
Materials	Vulcan Materials (VMC)	Allegheny Technologies Inc (ATI)	Alcoa Inc (AA)	The Mosaic Company (MOS)
Telecommunications Services	AT&T Inc. (T)	Frontier Communications (FTR)	Crown Castle International Corp (CCI)	Frontier Communications (FTR)
Utilities	EQT Corporation (EQT)	Sempra Energy (SRE)	NRG Energy (NRG)	Consolidated Edison (ED)

Source: the authors.

In computations and preparing graphical presentations, the software R version 3.0.1 (R Core Team, 2013) was employed with several of its libraries, `quadprog` (Turlach and Weingessel, 2013), `timeSeries` (Wuertz and Chalabi, 2013), `PerformanceAnalytics` (Carl et al., 2013), `fPortfolio` (Rmetrics Core Team and Wuertz, 2011) and `FRBData` (Takanayagi, 2011).

In the empirical exercise the in-sample-period ran from 1 Jan 2011 to 31 Dec 2012 and the out-of-sample period stretched from 1 Jan 2013 to 20 Nov 2013. Whereas the in-sample period was made up of 500 effective logarithmic returns on a trading daily basis, there were 225 effective logarithmic returns present in the out-of-sample period. Returns for the in-sample period were an ingredient in estimating the parameters of the Markowitzian mean-variance optimization (the expectation vector as well as the covariance matrix of returns) in a classic non-robust way as well as in a robust fashion (in which the MCD

estimator was of use). These estimates were instrumental in alternative Markowitzian portfolio selection with the desired expected return equivalent to the average in-sample return of the S&P 500 Index, i.e. 0.023 % p.d. (equivalent to 5.71 % p.a.). In their construction, short sales were permitted. The behaviour of these two Markowitzian portfolios is compared to the behaviour of two tracking portfolios, one of which is constructed by means of the normalized OLS estimator in (6), and the other through the constrained quadratic optimization in (3). These portfolios were tracked with respect to the S&P 500 Index, and in their construction, returns of the in-sample period were of use. The weights of the four optimized portfolios are shown in Table 2. Note that – despite the fact that no restriction on short sales was placed in portfolio tracking – all the tracking portfolios consists of long positions only. The composition of the Markowitzian portfolios in individual samples is not mutually dissimilar.

Table 2. The composition of individual portfolios

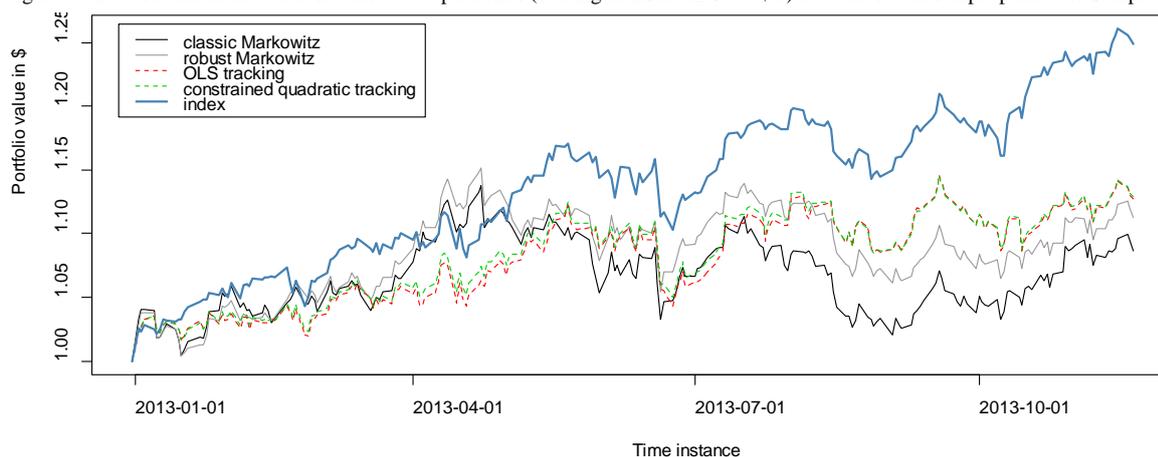
SAMPLE 1	SBUX	RAI	ANR	SLM	MRK	JOY	TDC	VMC	T	EQT
Classical Markowitz	2.89%	35.66%	2.02%	-13.48%	23.17%	-1.29%	-0.69%	-1.99%	56.52%	-2.80%
Robust (MCD) Markowitz	2.66%	32.30%	2.94%	-4.80%	27.61%	-2.11%	1.40%	-8.78%	50.39%	-1.59%
OLS quadratic tracking	8.17%	12.09%	2.49%	9.53%	15.91%	9.15%	8.53%	4.05%	21.79%	8.30%
Constr. quadratic tracking	7.85%	14.76%	1.85%	7.30%	16.46%	7.82%	7.69%	3.44%	25.27%	7.56%
SAMPLE 2	CCL	MKC	OXY	BRK.B	BIIB	VAR	AKAM	ATI	FTR	SRE
Classical Markowitz	4.91%	53.03%	-3.19%	1.92%	-6.24%	1.31%	1.09%	-5.45%	17.07%	35.56%
Robust (MCD) Markowitz	-0.80%	35.69%	3.09%	17.80%	-6.04%	11.35%	2.33%	-9.14%	13.92%	31.79%
OLS quadratic tracking	7.73%	13.37%	14.84%	25.49%	5.09%	6.51%	2.46%	6.83%	1.92%	15.77%
Constr. quadratic tracking	6.70%	18.43%	12.17%	22.77%	5.48%	5.75%	2.26%	4.83%	2.37%	19.24%
SAMPLE 3	JCP	GIS	NE	VNO	CAH	GE	TEL	AA	CCI	NRG
Classical Markowitz	3.05%	76.57%	-4.09%	6.53%	17.55%	-6.85%	0.76%	0.09%	6.79%	-0.40%
Robust (MCD) Markowitz	2.63%	74.33%	2.54%	9.38%	16.48%	-14.56%	-6.10%	2.68%	13.28%	-0.66%
OLS quadratic tracking	1.53%	11.69%	6.14%	15.92%	11.12%	18.40%	12.17%	12.17%	7.32%	3.54%
Constr. quadratic tracking	1.44%	19.45%	5.21%	14.17%	11.76%	16.04%	10.81%	8.95%	8.84%	3.34%
SAMPLE 4	AMZN	KMB	MRO	RF	AGN	CSX	XLNX	MOS	FTR	ED
Classical Markowitz	1.77%	44.75%	-0.09%	-10.08%	-2.24%	1.35%	5.73%	3.70%	6.92%	48.19%
Robust (MCD) Markowitz	0.71%	52.73%	-5.43%	-8.42%	-1.82%	5.96%	3.73%	3.44%	3.44%	45.67%
OLS quadratic tracking	6.42%	17.80%	4.27%	12.41%	15.67%	0.45%	14.71%	8.74%	2.28%	17.25%
Constr. quadratic tracking	6.27%	19.10%	4.09%	11.59%	15.11%	0.44%	14.44%	8.47%	2.25%	18.24%

Source: the authors.

According to the weights reported in Table 2, for each sample, four portfolios were fictively created as of 31 Dec 2012, the last day of the in-sample period, at their initial value \$ 1. Simultaneously, on that specific day \$ 1 was also fictitiously invested in the S&P 500 Index. The evolution of these portfolio values over the out-of-sample period is shown in Figures 1 to 4. The out-of-sample behaviour of the four constructed portfolios for each sample can be looked on and interpreted from several perspectives, but from the standpoint of an investor, the most decisive is the value of these portfolios on the last day of the out-of-sample period, as of 20 Nov 2013. No portfolio in any sample delivered a higher value than the S&P 500 Index did. In samples 1, 2 and 4 the ultimate value of index tracking portfolios was as of 20 Nov 2013 higher than the value of Markowitzian portfolios. Only in sample 3 the value of the portfolio

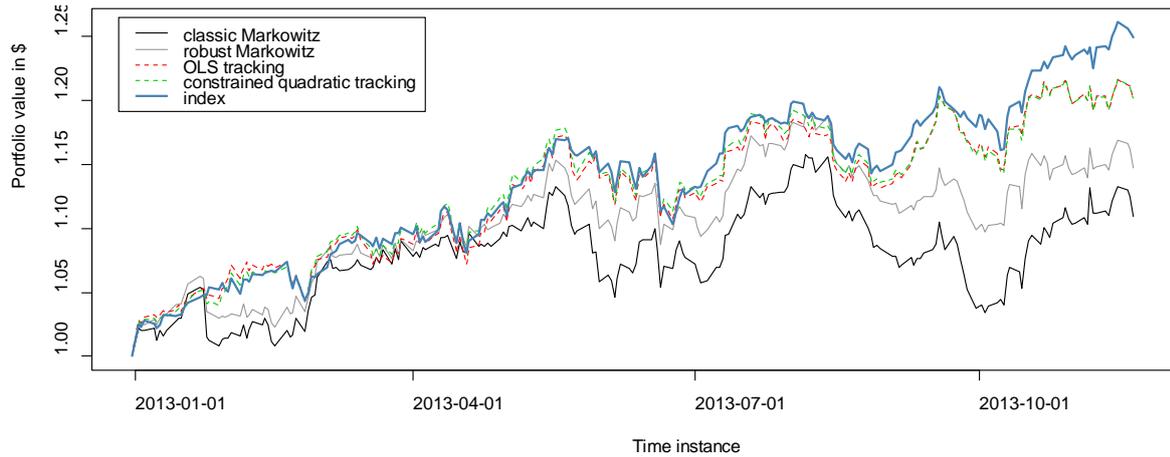
constructed by the classic Markowitzian approach was higher than the value of both index tracking portfolios. Having claimed superiority of quadratic index tracking compared to the Markowitzian approach in terms of the final evaluation, it must be said that this is chiefly due to the fact that 20 Nov 2013 was selected as the decisive landmark. If a different day had been chosen for reference, the final impression might have differed. The evolution of index tracking portfolios was mostly very similar, which was manifested by a very close overlapping or closeness of index tracking portfolio values in samples 1, 2 and 4. A slight discrepancy in the development of index tracking portfolio values is detected only in sample 3. Notable differences were found with the evolution of Markowitzian portfolios in all the samples except sample 4.

Figure 1 The evolution of the value of constructed portfolios (starting on 2012-12-31 at \$ 1) over the out-of-sample period for Sample 1



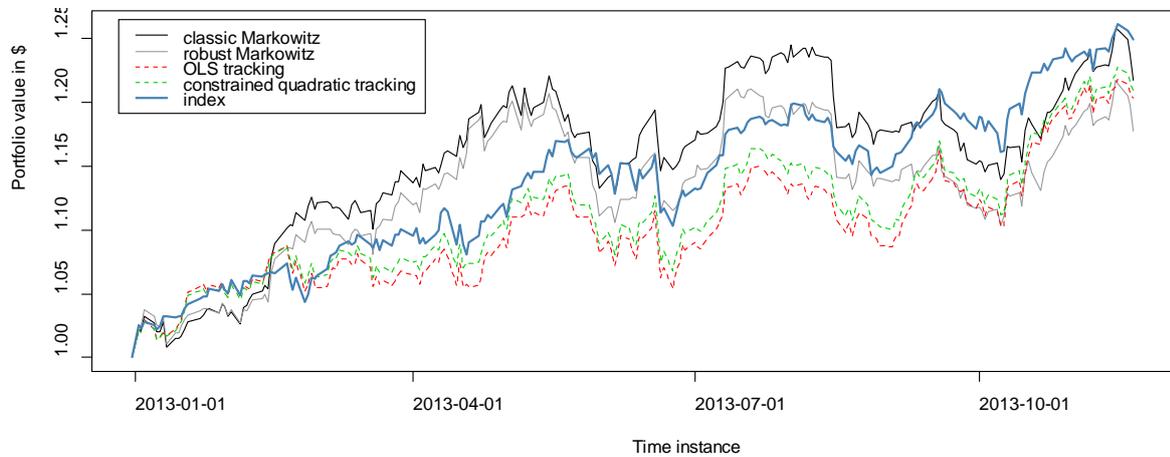
Source: the authors.

Figure 2 The evolution of the value of constructed portfolios (starting on 2012-12-31 at \$ 1) over the out-of-sample period for Sample 2



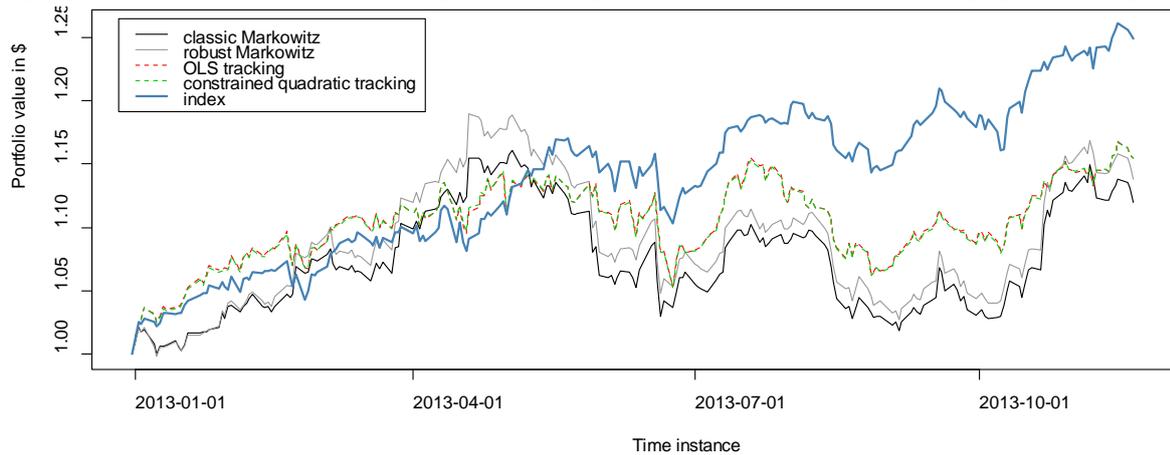
Source: the authors.

Figure 3 The evolution of the value of constructed portfolios (starting on 2012-12-31 at \$ 1) over the out-of-sample period for Sample 3



Source: the authors.

Figure 4 The evolution of the value of constructed portfolios (starting on 2012-12-31 at \$ 1) over the out-of-sample period for Sample 4



Source: the authors.

The performance of individual portfolios both in the in-sample period and in the out-of-sample period was evaluated by the conventionally used Sharpe ratio (in which computation, the 1Y nominal interest rate on U.S. government securities was used). Individual Sharpe ratios, average returns and risks measured by the standard deviation are reported in Table 3 that follows.

There are some distinctive features in the performance of individual portfolio selection methods, and on this attention is called to the bolded Sharpe ratio values in Table 3. Whilst the Markowitzian portfolios in each sample yielded highest in-sample performance in terms of mean return to standard deviation (also one index tracking portfolio in sample 1 can be tagged in this fashion), in the out-of-sample period it was the index tracking portfolios that showed highest performance on a

comparative basis and clearly outperformed both Markowitzian portfolios (with the exception of the classic Markowitzian

portfolio in sample 3). Nonetheless, none of the portfolios created indicated a higher Sharpe ratio than the S&P 500 Index.

Table 3. Return characteristics of selected portfolios on a daily basis

	Portfolio selection method	In-sample indicators (Jan 2011 – Dec 2012)			Out-of sample indicators (Jan 2013 – Nov 2013)		
		Average return (p.d.)	Standard deviation (p.d.)	Sharpe ratio (p.d.)	Average return (p.d.)	Standard deviation (p.d.)	Sharpe ratio (p.d.)
Sample 1	Classical Markowitz	0.02%	0.87%	0.0256	0.04%	0.86%	0.0424
	Robust (MCD) Markowitz	0.02%	0.90%	0.0248	0.05%	0.81%	0.0584
	OLS quadratic tracking	0.03%	1.27%	0.0196	0.05%	0.79%	0.0674
	Constr. quadratic tracking	0.03%	1.20%	0.0232	0.05%	0.77%	0.0696
	(Investing into) index	0.02%	1.19%	0.0189	0.10%	0.71%	0.1378
Sample 2	Classical Markowitz	0.02%	0.97%	0.0232	0.05%	0.87%	0.0525
	Robust (MCD) Markowitz	0.02%	1.00%	0.0224	0.06%	0.80%	0.0759
	OLS quadratic tracking	0.01%	1.30%	0.0055	0.08%	0.80%	0.1022
	Constr. quadratic tracking	0.02%	1.22%	0.0132	0.08%	0.79%	0.1035
	(Investing into) index	0.02%	1.19%	0.0189	0.10%	0.71%	0.1378
Sample 3	Classical Markowitz	0.02%	0.84%	0.0267	0.09%	0.84%	0.1041
	Robust (MCD) Markowitz	0.02%	0.85%	0.0262	0.07%	0.86%	0.0840
	OLS quadratic tracking	0.00%	1.31%	- 0.0004	0.08%	0.81%	0.1016
	Constr. quadratic tracking	0.01%	1.21%	0.0054	0.08%	0.77%	0.1089
	(Investing into) index	0.02%	1.19%	0.0189	0.10%	0.71%	0.1378
Sample 4	Classical Markowitz	0.02%	0.71%	0.0313	0.05%	0.81%	0.0611
	Robust (MCD) Markowitz	0.02%	0.77%	0.0290	0.06%	0.84%	0.0680
	OLS quadratic tracking	0.02%	1.16%	0.0177	0.06%	0.82%	0.0772
	Constr. quadratic tracking	0.02%	1.14%	0.0188	0.06%	0.82%	0.0779
	(Investing into) index	0.02%	1.19%	0.0189	0.10%	0.71%	0.1378

Source: the authors.

Table 3 manifests another property of the approaches: for each of the samples, no matter whether in the in-sample period or in the out-of-sample period, variability of returns found with the portfolios constructed by means of constrained quadratic tracking is lower than with those constructed by means of the unconstrained OLS quadratic tracking. This is further shown in higher values of the Sharpe ratio for the constrained quadratic tracking method. This might also be interpreted as an advantage of constrained quadratic tracking over unconstrained OLS quadratic tracking as the former method delivers more compact portfolios than the latter (of course, compact in terms of variability of portfolio returns). Moreover, it seems that the classical Markowitzian approach generated better results in the in-sample period whilst the robust Markowitzian approach seems preferable in the out-sample period.

4 Conclusion

The paper concentrates on portfolio optimization based on minimizing quadratic tracking error. Under this method to portfolio selection, the aim is to replicate a suitably chosen financial index so that the selected portfolio is as close as possible to the index with respect to the quadratic tracking error. This explains the address of the approach, quadratic index tracking. After a brief introduction of the methodology, an empirical exercise was undertaken so as to ascertain behaviour of this method in comparison to the traditional Markowitzian approach. A total of four random samples from stocks represented in the S&P 500 Index were considered and for each sample four portfolios were independently constructed replicating the S&P 500 Index. Two methods were quadratic tracking methods (the unrestricted OLS quadratic tracking and the restricted quadratic tracking) and two methods were traditional Markowitzian methods (the method using non-robust inputs and its robust alternative). Constrained quadratic tracking produce portfolios with lower variability than unconstrained OLS tracking, which leads to higher Sharpe ratios. The results of the empirical study conducted do not permit unequivocally to state as to whether the traditional Markowitzian approach or the tracking error approach is preferable. Some distortions may be caused by the fact that both of these approaches neglect

information on long-term trends encoded in asset prices, which may be seen as a deficiency of the methods. Newer approaches are founded on the concept of cointegration. Cointegration is a statistical property of time series that permits modelling non-stationary asset prices instead of stationary asset returns. As financial asset prices are non-stationary with a long memory, the cointegration analysis can be utilized to uncover the complex information in their trends and to explain more aptly their behaviour in the long run. This awareness stimulates further interest with the authors who will focus upon portfolio tracking based on the cointegration analysis in their future research.

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Primary Paper Section: A

Secondary Paper Section: none

THE IMPORTANCE OF FAMILY IN CHRISTIAN AND ISLAMIC RELIGION

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Abstract: Each religious tradition has its own specifics and differences in the perception of the same state, institution and value. These specifics of a particular religion can also be found in the perception of marriage, family and the upbringing of children. Islam and Christianity with their forefather Abraham, worshipping one God, pay major attention to family. Both religions are aware of its value and importance in today's society. For a society, in which family is experiencing a profound crisis. Particular similarities and differences in the perception of family in Islamic and Christian religion are included in the following article.

Keywords: family, marriage, Islam, Christianity

1 Introduction

The existence of the family, the basis of every country in the world, is threatened by many factors at this time. Current families are disintegrating due to the following reasons: alcoholism, addiction to gaming, tyranny or it is simply a whim of both partners and unwillingness to try to maintain the union at all costs for the good of children and society. Relationships are caught up in infidelity, jealousy, even in hatred. Children, a gift from God, are often the subject of disputes, hassles and divorce hearings. Affected by such situations, they are incapable of starting their own fully functional families later on. And so, young people, when perceiving this trend, worried and afraid, do not tend to get married and start their families. They live together without being married, without a sacrament, without a shared name, which is a joint, according to which we belong to a particular family. As an educator, I listen to the stories of children on a daily basis, and one week, the main role is playing mommy in an apartment with her "new friend" and a weekend with daddy in a house with "two new aunts". I could go on: "Daddy lives far away, I visit him sometimes. The aunt that lives there with him is expecting a baby and I do not know what it will be to me. Mommy also has a tummy, and the uncle is pretty good to me..." Many children tell me they have two dads, others do not have any... We make such society ourselves. The question is how world religions perceive family and how they could defend against this situation. To compare the institution of marriage and family in different religions, I chose two world religions based on the same tradition: Christianity and Islam.

2 Family in Christianity

According to the Catechism of the Catholic Church (hereinafter referred to as "CCC", 1999, p. 538, 2202), "Family is a basic unit of a social life. It is a natural community in which husband and wife are called to dedicate one another in love and to deliver a life. Authority, stability and lifelong relations within a family are forming the basis of freedom, security and brotherhood within society. Family is a community in which it is possible to acquire moral values from an early childhood; to begin worshipping God and to properly rejoice in freedom. Family life is an introduction to a life of society."

Hardly can we build a house without foundations, or with poor fundamentals. The house can withstand the first winds or frost and will be demolished because it does not have its strength and resistance. The same principle can be applied to a society without a good foundation – without family, which is solid and holds together, it cannot withstand the onslaught of bad influences and its entire core will be permanently impaired, it will lead to extinction. Inside the family, children should be taught moral values and educated in the right use of their reason and freedom – we can already see, it does not work that way. Parents are constantly overwhelmed by work and lack of time, so they pass the duties and responsibility of raising children on educators, teachers and the media. According to Christian

religion, parents should be the first teachers of life and faith. "Parents have the first responsibility for the education of their children. They bear witness to this responsibility first by creating a home where tenderness, forgiveness, respect, fidelity, and disinterested service are the rule. The home is well suited for education in the virtues. This requires an apprenticeship in self-denial, sound judgment, and self-mastery – the preconditions of all true freedom. Parents have a grave responsibility to give good example to their children. Parents' respect and affection are expressed by the care and attention they devote to bringing up their young children and providing for their physical and spiritual needs. As the children grow up, the same respect and devotion lead parents to educate them in the right use of their reason and freedom" (CCC, 1999, p. 542, 2223, 2228).

In a functional marriage and family unit children can learn moral values necessary for a healthy attitude towards life and society. For functional relationships within the family, friendships, later in the workplace and therefore the whole society. "Marks of the True Christian - Let love be genuine. Abhor what is evil; hold fast to what is good. Love one another with brotherly affection. Outdo one another in showing honor. Do not be slothful in zeal, be fervent in spirit, serve the Lord. Rejoice in hope, be patient in tribulation, be constant in prayer. Contribute to the needs of the saints and seek to show hospitality. Bless those who persecute you; bless and do not curse them. Rejoice with those who rejoice, weep with those who weep. Live in harmony with one another. Do not be haughty, but associate with the lowly. Never be wise in your own sight. Repay no one evil for evil, but give thought to do what is honorable in the sight of all. If possible, so far as it depends on you, live peaceably with all. Beloved, never avenge yourselves, but leave it to the wrath of God, for it is written, "Vengeance is mine, I will repay, says the Lord." To the contrary, "if your enemy is hungry, feed him; if he is thirsty, give him something to drink; for by so doing you will heap burning coals on his head." Do not be overcome by evil, but overcome evil with good" (Romans 12:9-21). The image of society where these values would be being lived would definitely look a lot different than the one we already know.

The basic verse of the Bible defining marriage, which shows its importance, is a verse from the Old Testament, from Genesis: "Therefore a man shall leave his father and his mother and hold fast to his wife, and they shall become one flesh" (Genesis 2:24). A man should be emotionally stronger and mature; he should leave his safe home environment and live with a woman. For a woman – as a daughter, this decision is more difficult, since she is bound to her mother and to help her parents and the household in which she grew up. About the decision for marriage – and the reasons for its establishment, we read in the New Testament, in the Letter to the Corinthians: "Principles for Marriage - Now concerning the matters about which you wrote: "It is good for a man not to have sexual relations with a woman." But because of the temptation to sexual immorality, each man should have his own wife and each woman her own husband. The husband should give to his wife her conjugal rights, and likewise the wife to her husband. For the wife does not have authority over her own body, but the husband does. Likewise the husband does not have authority over his own body, but the wife does. Do not deprive one another, except perhaps by agreement for a limited time, that you may devote yourselves to prayer; but then come together again, so that Satan may not tempt you because of your lack of self-control. Now as a concession, not a command, I say this. I wish that all were as I myself am. But each has his own gift from God, one of one kind and one of another. To the unmarried and the widows I say that it is good for them to remain single as I am. But if they cannot exercise self-control, they should marry. For it is better to marry than to burn with passion.

Inseparability of marriage – To the married I give this charge (not I, but the Lord): the wife should not separate from her husband (but if she does, she should remain unmarried or else be

reconciled to her husband), and the husband should not divorce his wife" (Corinthians 7:1-11).

For the same reasons (among others) of possible adultery and prostitution, men and women should enter into marriage in Islamic religion as well; it will be discussed in more detail in the next chapter of this contribution.

Regarding the next part of the verse about the inseparability of marriage, Christian religion based on the Bible is expressing a negative attitude towards divorce. In the New Testament, in The Gospel According to Matthew, we find the first mention about it: "And Pharisees came up to him and tested him by asking, "Is it lawful to divorce one's wife for any cause?" He answered, "Have you not read that he who created them from the beginning made them male and female, and said, 'Therefore a man shall leave his father and his mother and hold fast to his wife, and the two shall become one flesh'? So they are no longer two but one flesh. What therefore God has joined together let not man separate." They said to him, "Why then did Moses command one to give a certificate of divorce and to send her away?" He said to them, "Because of your hardness of heart Moses allowed you to divorce your wives, but from the beginning it was not so. And I say to you: whoever divorces his wife, except for sexual immorality, and marries another, commits adultery" (Matthew 19:1-9).

Therefore, no man or a judge or notary is allowed, according to Christianity, to separate – divorce marriage. Divorce is against God's plan, it is unacceptable. It is a social plague, as accurately found in the Catechism of the Catholic Church: "Divorce is a grave offense against the natural law. It claims to break the contract, to which the spouses freely consented, to live with each other till death. Divorce does injury to the covenant of salvation, of which sacramental marriage is the sign. Contracting a new union, even if it is recognized by civil law, adds to the gravity of the rupture: the remarried spouse is then in a situation of public and permanent adultery" (CCC 2384). "Divorce is immoral also because it introduces disorder into the family and into society. This disorder brings grave harm to the deserted spouse, to children traumatized by the separation of their parents and often torn between them, and because of its contagious effect which makes it truly a plague on society" (CCC 2385). Therefore, it affects not only the spouses, but also children, families of both sides, relatives, friends, and thus society as a whole. It affects children of all ages; it interferes their emotional condition and an idea of a perfect family, and thus reflects the fear of starting their own one in the future. An exception to being separated or divorced and being able to receive the sacraments is applied for innocent victims of divorce, abused women, deceived partner. Such exceptions are being granted by bishops in particular dioceses. Although these victims of divorce can access to the sacraments, she cannot live with a new partner; it is still considered adultery. We can find the mentioned fact in the Catechism, in the textbook of Christianity: "It can happen that one of the spouses is the innocent victim of a divorce decreed by civil law; this spouse therefore has not contravened the moral law. There is a considerable difference between a spouse who has sincerely tried to be faithful to the sacrament of marriage and is unjustly abandoned and one who through his own grave fault destroys a canonically valid marriage" (CCC 2386). Widows may get married for a second time, but only in a church, therefore receiving the sacrament of matrimony; she cannot live with another man without ecclesiastical marriage.

The status of women in Christian marriage is similar to the Islamic religion. In Islam, it is still somewhat lower, despite the fact that at the time of Muhammad, this area was experiencing a great progress. Therefore, a woman is subordinate to a man even in Christianity, because a man has to provide for the family, and should be responsible for its functioning. However, the Bible points out that it does not give him the right to humiliate or even torture his wife; a man should appreciate his wife as he appreciates his own body, and thus should not hurt her, as he would not hurt himself. He should honor her, as we read in the New Testament, in The Epistle to the Ephesians: "Husbands,

love your wives, as Christ loved the church and gave himself up for her, that he might sanctify her, having cleansed her by the washing of water with the word, so that he might present the church to himself in splendor, without spot or wrinkle or any such thing, that she might be holy and without blemish. In the same way husbands should love their wives as their own bodies. He who loves his wife loves himself. For no one ever hated his own flesh, but nourishes and cherishes it, just as Christ does the church, because we are members of his body. "Therefore a man shall leave his father and mother and hold fast to his wife, and the two shall become one flesh." This mystery is profound, and I am saying that it refers to Christ and the church. However, let each one of you love his wife as himself, and let the wife see that she respects her husband" (Ephesians 5:25-33).

Most discussed polygamy in Islamic religion is unacceptable by Christianity, as we can find in the Catechism: "However, polygamy is not in accord with the moral law. Conjugal communion is radically contradicted by polygamy; this, in fact, directly negates the plan of God which was revealed from the beginning, because it is contrary to the equal personal dignity of men and women who in matrimony give themselves with a love that is total and therefore unique and exclusive" (CCC 2387).

Callaghan in recent Guide to World Religions describes the condition of a marriage conclusion in a church today; he evaluates the overall view of Christianity on the family in the past and today as follows: "Early Christianity considered the family a basic unit; however, authority and influence were often concentrated in monastic institutions and clerical spheres which supported celibacy. Another feature of early Christianity was leaving of ascetics to abandoned places, therefore this way of life did not result into a family life. All the mentioned aspects caused that Christianity in early centuries and Middle Ages often faced paradoxes regarding family. Christianity supported traditional marriage and children's upbringing in marriage; however laymen, both married and unmarried; usually found themselves out of forceful structures where mainly clerical celibacy prevailed. Even in modern times Christianity emphasized the importance of family as a basic building unit of society, believing the ideal of marriage is between a man and a woman. Therefore, it was difficult for many churches to incorporate divorced people who had civil marriage. Yet, at the end of the 20th century and at the beginning of the 21th century, the percentage of marriages conducted in the temple rapidly decreased, moreover, the impact of traditional church teaching on daily life decreased as well. Many believers are convinced that in order to change this trend, the church should be less focused on sexual morality and appreciate that morality is pervading to the social and economic spheres. They are comparing the history of an early church and Jesus Christ' initial concept with more recent historical periods, when the church merged with the powerful and did not fight for the needs of the helpless and homeless. Especially Christians in South America have formulated a theological approach, which emphasizes social justice and deliverance from physical misery in addition to spiritual liberation as the basis of Christian salvation seeking" (Callaghan, 2012, p. 35).

I think young people do not conclude marriages in a church from fear; fear of failure, divorce and the subsequent difficulties. They are overwhelmed with the information about an increasing divorce rate and stories of famous people about another sinking marriage. Engaged couples lack mutual trust, respect and security. They face the fear of infidelity, lies or even abuse. They know that by divorce they would lose the opportunity to continue to receive the sacraments and thus strive for Heaven. Everywhere we here a familiar phrase "we do not need a piece of paper". However, God wants to bless the relationship of two young people in love, he wants to give them strength everyday and give them the greatest gift of all – children.

On the first steps of a new journey which is a married life, engaged couples are accompanied by the words of the Bible in a church during the ceremony, specifically the New Testament, in

a First Letter to the Corinthians – The Way of Love, which I will close this chapter with. Love described in this hymn should serve them as a model for their whole life, which they should cherish. Only this way they will handle everyday worries of a marital and family life; and this true, selfless love should be passed on to their children and the next generations; so the society which we live in, could be better:

“The Way of Love - If I speak in the tongues of men and of angels, but have not love, I am a noisy gong or a clanging cymbal. And if I have prophetic powers, and understand all mysteries and all knowledge, and if I have all faith, so as to remove mountains, but have not love, I am nothing. If I give away all I have, and if I deliver up my body to be burned, but have not love, I gain nothing.

Love is patient and kind; love does not envy or boast; it is not arrogant or rude. It does not insist on its own way; it is not irritable or resentful; it does not rejoice at wrongdoing, but rejoices with the truth. Love bears all things, believes all things, hopes all things, endures all things. Love never ends. As for prophecies, they will pass away; as for tongues, they will cease; as for knowledge, it will pass away. For we know in part and we prophesy in part, but when the perfect comes, the partial will pass away. When I was a child, I spoke like a child, I thought like a child, I reasoned like a child. When I became a man, I gave up childish ways. For now we see in a mirror dimly, but then face to face. Now I know in part; then I shall know fully, even as I have been fully known. So now faith, hope, and love abide, these three; but the greatest of these is love” (Corinthians 13:1-13).

3 Family in Islam

As I mentioned in the introduction, for both religions family is equally important. According to Callaghan: „Marriage is a union between two individuals; however in Islam, it has a much broader meaning, because through marriage, two families are bonding as well. It is in the family where a child and young person can be formed and dedicated to Islamic values and the Islamic way of life. Family is the unit that provides education to children, as well as teaching. Significant parts of the Quran are dedicated to teachings on marriage. According to them, all sexual activities should be performed in marriage; extramarital relations are strictly prevented. In a Muslim society, rigorous punishments can be imposed for fornication or adultery. In many Muslim communities, conventional marriages are conducted. Such practices may be strange to Western countries, but in Muslim communities, this agreement is considered a wise decision. It creates an alliance between two families. Marriage is concluded with the assumption that couple may rely on collective wisdom and advice of parents and wider community” (Callaghan, 2012, p. 69).

It is written similarly by Partridge: “Family is a key element of Muslim life and society, one of the cornerstones of social stability and security within municipality (umma). Quran and Hadith abound regulations, restrictions and warnings concerning the organization and behavior of Muslim families and family ties are the strongest of all social relations. Loyalty and devotion to family are superior to any other social loyalty. Muslim family is created by marriage, and any extramarital relations between men and women are being disputed by Islam. The act of procreation remains exclusively within the family unit; fornication and adultery (ziná) are sins, which are rigorously punished by Islamic law. Such distortions are considered a source of chaos (fitna). Privacy and modesty are essential for the procreation and proper upbringing of children. A parent has the first responsibility for the proper care of children as well as their upbringing, and there is a hadith confirming proverb “Love begins at home”. Family care is even more important than religious charity. Despite western opinions, Muslim parents treat boys and girls equally. Children are considered a gift from Allah and there are special commands in the Quran against child abuse, particularly those relating to the pre-Islamic custom of burying little girls alive under the sand” (Partridge, 2006, p. 387).

Highlighted proverb above can be the basis for any family – Christian, Muslim, Hindu or Atheist. Only a person, who can feel love and is experiencing love himself, can give it further.

A prophet once said: “The best of my people is the one, who proves his family the perfect kindness and goodness.” Muslims in rural areas or in larger cities lived mostly in multigenerational extended families, which often included several cousins, aunts and uncles. These large families overcame the isolation that affects a modern family. The formula for obligations and social responsibility in a large family was based on Islamic norms, customs and values.

Muslim family norms represent the respect for elders, love and attention to children; to a larger extent than the competition, self-control and cooperation. In relationships within a family and between families has enhanced the timeless, revitalizing qualities such as selflessness, patience and being caring” (Haeri, 2000, p. 173).

Here we can see a big difference between families living in the West, as well as many Christian families. Isolation, which affects them, is not good. We are observing a trend of separating from an original family. People are visiting their parents and grandparents less frequently; unfortunately, families are often meeting only at the funerals.

“In Islam, marriage is not considered a sacrament, rather a social and civil partnership” (Callaghan, 2012, p. 69).

Here we can see another difference, which is in the perception of an institution of marriage; since in Christianity, marriage is one of the seven sacraments – along with Baptism, Confirmation, Eucharist, Holy Orders, Anointing of the Sick and Reconciliation. It is administered in a church, in the presence of a priest and the witnesses from both sides.

We are approaching the most discussed difference between Islamic and Christian religion, which is polygamy: “In some Muslim communities, man is allowed to marry multiple women. However, he must treat all his women equally. If he does not, he should only marry one woman. This custom originated after the Battle of Uhud, in 625 A.D.; when a lot of women were left destitute. Polygyny provided a solution. Many Muslims believe it was a rare situation at that time, and should not persist now” (Callaghan, 2012, p. 69).

It is written similarly by Huston Smith in one of the best publications about religion: “It is true that the Quran allows a man to have up to four wives at the same time, but there is an opinion that a careful interpretation of these rules are moving towards monogamy as the ideal. This view is also supported by the Quran that says: “But if you fear that you will not be just, then [marry only] one or those your right hand possesses” (Surah 4:3). Some lawyers conclude that the Quran actually preaches monogamy, as it is almost impossible to divide your love and attention evenly.

Despite what has been said, the fact is that the Quran permits polygyny; after the death of Khadija, Muhammad had more women. Muslims consider both facts as examples of adaptability of Islam to different circumstances. They say that there may be circumstances where it is more moral to choose polygyny. One of the examples is the extermination of the male population in the war that confronts the choice between polygyny and the fact that majority of women would be deprived of the possibility of motherhood and starting their own households, which would lead to prostitution. Muslims also emphasize that polygamy is at least as common as in the West, except that there are occurring consecutive marriages. Is the serial polygyny morally significantly higher than the current polygyny, while Muslim women have the right to leave the marriage through divorce, if they wish so” (Smith, 1994, p. 166 n).

I met with the term “serial polygyny” for the first time. The West has nothing to blame a Christian religion for; many of us are

already married for a second or third time. They were not able to behave respectfully towards their first two wives, they cannot even talk after divorce, they are starting new families and it affects the children the most. In Islam, a husband is supposed to treat all his wives equally, he has to be righteous. In this regard, Western men still have a lot to learn. However, it does not have any connection to Christian religion; because it is, and should be conducted only one – by God and with one partner for a lifetime.

Hruškovič (1997) in a publication *Islamic Legal System and the Process of its Formation* writes that marriage in Islam is understood primarily as an economic contract between the families of the spouses. “The contract of marriage causes certain legal effects. A woman becomes entitled to the mahr and the right to existential resources. She also obtains the right to share of inheritance. When entering a marriage, she gets the mahr which can easily be described as the fee that a husband is obliged to pay; however, it is not a requirement. According to a classical Sunni law the institute of the mahr served to ensure a married woman, and which a man is endowing a woman with, when entering into a marriage. The mahr was particularly significant for the development of the legal effects of marriage. The institute of the mahr is retained in modern Islamic law” (Hruškovič, 1997, p. 57).

Allah does not approve of divorce, but it is allowed, if necessary, there are also several types of divorce. Their differences are influences by the traditions and countries, I will mention the countries of Central Asia, where the original Islamic law “has already known four types of divorce, according to Sharia” (Hruškovič, 1997, p. 64):

1. Divorce Baa'in (irrevocable divorce),
2. Divorce Raj'ee (the husband may revoke his divorce),
3. Divorce Khula (the wife takes the initiative to divorce and has to part with her dower or a part of some other property),
4. Divorce Mubarat (mutual agreement of both spouses, however the husband is entitled to require a material compensation for an agreement to divorce).

In Christianity, celibacy is very important for a priestly and religious life, in Islam “celibacy itself is not considered a virtue except for special cases, as the inability to properly provide for a wife. People in appropriate age are advised to marry in order to not be tempted by extramarital sexual relations” (Partridge, 2006, p. 387). According to Christianity, celibacy is the only possible alternative to live for God and to be liked by God only, and not by the wife or the husband; so the priests and religious can devote all their time to faith.

We can approach to the status of women, which is contradictory in both religions. “Islam is usually blamed for the degradation of women, mainly because it allows polygamy. In historical perspective, when comparing the status of an Arab woman before and after Muhammad, we find that this is apparently a false accuse. Under conditions where the birth of a girl itself was considered a disaster, the Quranic reforms significantly improved the status of women. They forbade the killing of children. They demanded that the inheritance should include daughters – obviously, not equally as sons, considering that daughters are not financially responsible for their household as the sons are. In terms of civil rights; the right to education, the right to vote and the right to pursue a profession; the Quran leaves open room for the full equality of women and men, which is gradually being approached by Muslim nations with the modernization of their customs. The most important contribution of Islam for women was definitely a new marriage adjustment. The Quran also demanded that the woman should express a free consent before marriage; and it also significantly strengthened marital relationship. The Quran does not forbid divorce, but tolerates it only as the last option. During marriage, a husband should give to his wife a financial amount, on which they both agreed, that a woman obtains if it comes to a divorce. Wives, as well as husbands, can initiate divorce if necessary” (Smith, 1994, p. 166 n).

Haeri describes, in detail, the role of men and women: “The role of a man, associated with material support and protection, makes him responsible for provision of the household. Because of his responsibilities, he acquired the authority within the family so its members can function fully and effectively. The man's protective role, however, does not prevent a woman from having her possessions. The Prophet's wife Khadija was extremely rich although she decided to use her possessions in the name of Allah. In the best stages of Muslim life, a woman played a key role. In this century, their role persisted mainly in rural areas as a necessity, but in urban conditions, the role of a woman is often reduced to taking care of the household. Lack of education and social awareness led to the inability of women to creatively contribute to a wider spectrum of a social life. A woman, however, should not have such status, as continually emphasized the Prophet and the Quran. If it is impossible to fully experience the liberation that Islam brings to all human beings, then oppressive tribal nature and ignorance prevails. Healthy family life and development, which Islam supports and brings with the individual and in society, can flourish only if there is an active, complementary relationship in its core, of which the Quran says: “They (wives) are a garment for you and you are a garment for them” (Surah 2:187) (Haeri, 2000, p. 173).

The Quran also includes various commands related to the status of men and women, and these commands “clearly indicate that there is a fundamental principle of equality and reciprocity” (Surah 2:187 and 228), which Muhammad emphasized in his valedictorian speech on the top of Mount Arafat. Duties of husband and wife are not equal. The husband is the breadwinner of his wife and children, thus giving them necessary food and clothing, while the wife is obliged to maintain domestic order and directly raise children. Equality reflects a theological equality between men and women, which many verses of the Quran emphasize (e.g. Surah 4:1) (Partridge, 2006, p. 389).

This Surah in particular, but also many others, is mentioning Spencer in his book *Islam without a veil*: “Muslims, when faced with western views on the issue of women's rights, are often pointing out several verses, which establish equality of men and women in front of Allah. One of them says: “O mankind, fear your Lord, who created you from one soul and created from it its mate and dispersed from both of them many men and women” (Surah 4:1). Another says: “Never will I allow to be lost the work of [any] worker among you, whether male or female; you are of one another” (Surah 3:195). Although, there is a certain hierarchy: “And due to the wives is similar to what is expected of them, according to what is reasonable. But the men have a degree over them” (Surah 2:228). This superiority is a God's command: “Men are in charge of women by [right of] what Allah has given one over the other and what they spend [for maintenance] from their wealth” (Surah 4:34). Spouses are therefore recommended: “Your wives are a place of sowing of seed for you, so come to your place of cultivation however you wish and put forth [righteousness] for yourselves” (Surah 2:223). It can be stated that in addition to this instruction, we still have not found anything stronger than the verses of St. Paul, which are worshipped by the priests and the pastors in the West: “Subjecting yourselves one to another in the fear of Christ. Wives, be in subjection unto your own husbands, as unto the Lord” (Ephesians 5:21-22). The idea that men are superior to women was at different times enforced according to this verse, however this interpretation is simultaneously balanced with a responsibility of a man to love his wife with sacrificial love: “Husbands, love your wives, even as Christ also loved the church, and gave himself up for it” (Ephesians 5:25). But if the apostle truly wanted to say that men are superior to women in a certain consideration, it is not to such an extent as it is in the Quran, for example, in the instruction for the court testimony: “And bring to witness two witnesses from among your men. And if there are not two men [available], then a man and two women from those whom you accept as witnesses - so that if one of the women errs, then the other can remind her” (Surah 2:282). This means that the female witness is of half value of the male witness” (Spencer, 2006, p. 87).

Thus we can see the difference between individual religions in the status of women. In Christianity and Islam a woman is subordinate to man, with the condition to respect a man; in Islam we observe the difference based on the Quran that a woman's testimony is worth half that of a man. Many argue that Muslim women are humiliated by veiling, however, this fact explains Smith in more detail (Smith, 1994, p. 166 n): "Regarding the veiling of women and their separation, the Quranic commands are concise. It only says: "Say to thy wives and daughters and the believing women, that they draw their veils close to them" (Surah 35:39). Extreme applications of this command are the matters of local customs and are not religiously binding."

4 Conclusion

The importance of family in Islamic and Christian religion is the same in many ways. Both religions put emphasis on the upbringing of children; on their lead to virtues – wisdom, justice, love, the right use of their freedom with full responsibility, so they can grow into people with the potential to change this society for the better.

Both of these world religions consider the establishment of marriage as an institution to be a result of human nature, which has a natural tendency to adultery and promiscuity. To avoid these tendencies, sexual intercourse is allowed only within marriage. In Christianity, marriage is a sacrament as well as a decision for a priestly life in celibacy. In Islam, celibacy is not a virtue, nor marriage a sacrament.

In the Islamic world, two families are joining by marriage – economically, by wisdom and experience. In Eastern countries, we observe a trend of small families with one child that tend to be separated from their original families.

By marriage, a Muslim woman receives a protection from her man – the opportunity to inherit, and a mahr. It is similar with a Christian woman; however, we do not find anything about a mahr in Christian texts.

Regarding the equality of men and women: in both religions, we are all equal in front of God; however, there is a certain superiority of men over women in Christianity and Islam, for simple reasons – a man has an obligation to provide for his family, while a woman fulfills her role as a mother. When

considering superiority, there is an obligation based on the Bible and the Quran, to have respect for the wives. The veiling of Muslim women is a matter of traditions and customs in particular areas.

Divorce is forbidden in Christianity, not accepted by God. Muslims have the opportunity to divorce their wives, there are also many types of divorces, which are mostly based on an economical compensation. Allah does not approve of divorces; he only allows them when necessary.

A Christian man can only have one wife for a lifetime, a Muslim man can have up to four wives if he treats them with equal respect and affection.

The greatest match remains the fact, that in the institution of marriage, both religions want to reach the good: the good of an individual, both partners, the good of children and the good of the whole society. Society that needs a functional family inevitably.

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Primary Paper Section: A

Secondary Paper Section: AA

THE IMPORTANCE OF THE SCHOOL SUCCESS IN THE SELF-ASSESSMENT OF A PUPIL WITH THE LEARNING DISABILITY

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Podpora terciárneho vzdelávania študentů se specifickými vzdělávacími potřebami na Ostravské univerzitě v Ostravě, reg. č.: OP VK CZ.1.07/2.2.00/29.0006

Abstract: If pupils are successful in school, their self-confidence will be supported and they will easily believe in their success in their life. Pupils with the specific learning disabilities are losing their confidence in their abilities and they start to believe in an inefficiency of their effort. School assessment participates in shaping mental parts of the personality of each pupil, because it influences the area of pupils' confidence, their consciousness "I", their self-assessment, the area of their aspirations, motivational structures and their position in a group. It markedly influences their relationships with other people and their perspectives and opportunities to enforce.

Keywords: self-assessment, self-concept, self-assessment of a pupil, specific learning disability, school self-assessment, pupil with the specific learning disability..

1 Introduction

Specific learning disability is a phenomenon, which changes the self-assessment of a child and lowers its confidence and self-esteem. A preservation of self-confidence is important, because it helps to resist a different difficulty connected with the specific disability (Czudnowski-Mardell, 2001 quoted in Vágnerová, Krejčová, 2006).

A persistent failure of children with the specific learning disabilities often worsens their position in the class. Pupils with the specific learning disabilities have worse self-assessment than their schoolmates without these problems, but this self-assessment is lowered mainly in the area influenced by their disability (Chapman, Tunmer, 2003 quoted in Vágnerová, Krejčová, 2006). Children with dyslexia have worse self-assessment only in the reading, alternatively in other language skills, but they consider themselves as the average even above the average in other areas. It seems that these children do not have a tendency to evaluate their results as negatively as their teachers (Aldridge, 2004 quoted in Vágnerová, Krejčová, 2006). Usually, it is very difficult for pupils with the specific learning disabilities to equalize with others, because they are not able to work at the same level. They have often permanent the worst ratings. Despite that surroundings behave to these pupils with the empathy and understanding, they often fully know their weaknesses. A repeated experience of failure always raises a probability of a deterioration of self-assessment and a formation of insufficient self-confidence (Svoboda, Krejčířová, Vágnerová, 2001). There is a risk of development of inferior feelings because of inability of these pupils to handle school activities in a comparison with their schoolmates (Matějček, 1989 quoted in Šporcrová a.i., 2002). This feelings might also show in a different area. There might be a general negative attribution when are these children evaluated as generally unable and reluctant to work. They are attributed by low competences and nobody expects anything positive. These children feel a distrust in achieving of better results and they cannot preserve sufficient self-confidence (Svoboda, Krejčířová, Vágnerová, 2001, Vágnerová, Krejčová, 2006). Settle and Milich (1999) claim that if children are exposed to a frequent failure, it is probable that a strategy of learnt powerlessness will develop (Kotrusová, 2005). Repeated failures lower the motivation to learn. A pupil has bad experience and that is the reason why he do not expect that he can be successful sometime and he stop with his effort (Svoboda, Krejčířová, Vágnerová, 2001). The source of a frustration of children with the learning disabilities is an inability to satisfy expectations of others. It brings a rage and anger toward school, teachers and parents. A child can often suppress its anger in school and it becomes extremely passive (Gabriřová, 2006 quoted in Tichá 2007/08). However, some pupils continue to study despite difficulties and lower satisfaction. The attitude

of a pupil depends on many factors: personal features, general stability, resistance to burdens, social support of family, good social position among peers etc. (Svoboda, Krejčířová, Vágnerová, 2001). Pupils acquire attributions of personality in the education process, which condition the following development of their self-concept (Kranz, 2004 quoted in Schusterová, Štochmalová 2004). School is an institution which allows own realization to a child and simultaneously it is a significant determinant of creating their self-concept. The quality of a self-assessment has a major emotional and social importance and it signals the degree of an adjustment with a difficulty of school failure (Vágnerová, Krejčová, 2006). It is important for activities in school what the child thinks about itself and about its learning competences. "Self-assessment is a base of a particular expectation and therefore it influences the motivation to learn" (Schusterová, Štochmalová, 2004). Self-assessment of children is influenced by opinions of teachers, experience and the influence of teachers and general climate of the class. It is also connected to marks and it is interesting that the self-assessment is more connected to an emotional attitude to school than to real own performances when it is correlated with fears from school (Vágnerová, 1995 quoted in Kosová, 1997).

2 Research study

School is an institution where you are also rated besides gathering knowledge, skills and habits (Vařařová, 2004). All rating processes and their demonstrations, which directly influence school teaching, are considered for the rating (Slavík, 1999 quoted in Vařařová, 2004). One of important factors is a teacher and his rating which can differently influence a creation of assessment and self-assessment competences of pupils (Kolář, Šikulová, 2009).

Assessment of an individual is connected with their social need – to be evaluated mainly positively, objectively and fairly. It is also connected to a need of success, which is one of the most progressive spiritual need of people (Velikanič 1973, quoted in Vařařová 2004).

The goal of the research, which was realized in elementary schools for pupils with the physical disability in Bratislava, was to find out the level and the structure of school self-assessment of pupils with the learning disabilities in the conditions of education in common learning process. At the beginning, we assumed that the level of school self-assessment is lowered among pupils with the specific learning disabilities.

The basic diagnostic instrument was the Student's Perception of Ability Scale – SPAS. Authors of this questionnaire are F.J. Boersma and J.U. W. Chapman, who originally chose 200 questions for pupils from the elementary school which were related to school performance and attitudes of pupils to the school. In Czechoslovakia, SPAS was used in 1981 for the first time. It was among children with dyslexia. Authors were Z. Matějček and M. Vágnerová. It was also successful among chronically ill children and children with different disabilities.

Lower age line (recommended) is formed by children with "social level of reading" (60 words per minute). The pupils from the 3rd grade are in this group. Upper age line (recommended) is formed by the pupils from the 9th grade from the elementary school. Original test SPAS created by F.J. Boersma and J.U. W. Chapman was changed and adapted to our school conditions. The test has 6 scales with 8 items which are marked in the followed way: general competences, Math, Reading, Orthography, Writing, self-confidence. We did not notice bigger problems during the administration. SPAS consists from 48 instructions. Child do a ring on answers YES and NO. Results were evaluated and processed. We recorded results in the graphs and tables.

The research sample was 125 pupils (44 girls and 81 boys) with the specific development learning disabilities who were educated in common elementary school. In the sample were pupils from the 5th to 9th grade of common elementary school. First group consists of 43 pupils from elementary school ES Kuliškova 8 in Bratislava. The second group consists of 82 pupils from the elementary school ES Jelenia 16 in Bratislava.

Tab. 1 Average sten rate measured by authors of SPAS in particular items

Scale	Children with failing grades		Children with excellent grades		Chronically ill children
	B	G	B	G	
1.	3,3	2,9	7,7	8,5	6,8
2.	3,7	3,3	7,6	8,2	6,5
3.	4,2	3,3	5,8	6,9	5,6
4.	3,9	3,5	7,7	6,8	6,5
5.	5,1	4,9	6,4	6,5	6,6
6.	3,9	3,3	7,8	8	6,3
TS	3,5	3,2	7,7	8,5	6,5

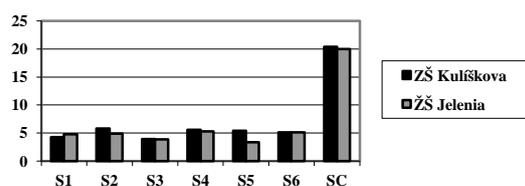
Legend: 1.general competences, 2.Math,3. Reading, 4.Orthography, 5.Writing, 6.Self-confidence,TS – total score, B-boys, G-girls

Tab. 2 Average rates – rough score, sten in scales SPAS – ES Kuliškova – ES Jelenia

	ZŠ Kuliškova	ZŠ Jelenia	l. sign.
HS1	2,37	2,80	0,177
S1	4,30	4,77	0,129
HS2	3,98	3,00	0,032
S2	5,79	4,89	0,037
HS3	3,53	3,65	0,767
S3	3,93	3,87	0,757
HS4	3,56	3,13	0,322
S4	5,58	5,32	0,793
HS5	3,88	5,32	0,814
S5	5,40	3,35	0,312
HS6	3,12	5,15	0,544
S6	5,12	5,15	0,739
TS	20,16	19,85	0,841
S	4,58	4,59	0,783

Graph 1 Sten in scales SPAS – comparison ES Kuliškova – ES Jelenia

Comparison ES Kuliškova - ES Jelenia



From the table 2 an graph 1 can be seen that average measured rates in average rough score and also in sten are among pupils ZŠ Kulišková and pupils ES Jelenia almost the same. The statistic significance reach only in the scale Math. When we focus on average measured rates in the particular scales of SPAS, pupils from ES Kuliškova reach higher average measured rates in the scale Math and in the scale Orthography. The pupils from both schools reach almost the same average rates in the scales Reading and Self-confidence. The pupils with the specific learning disabilities from both schools evaluate their intellectual competences, readiness and successfulness as very low.

Tab. 3 ZŠ Kuliškova – ZŠ Jelenia – sten in scales SPAS in comparison with the group of pupils with failing grades pupils with excellent grades and chronically ill children

ES Kuliškova – ES Jelenia sten in scales –general

Pupils with failing grades B	3,3
Pupils with failing grades G	2,9
Pupils with excellent grades B	7,7
Pupils with excellent grades G	8,5
Chronically ill children B	6,8
ES Kuliškova	4,3
ES Jelenia	4,77

Legend: ES – elementary school, B – boys, G – girls

Tab. 4 ES Kuliškova – ES Jelenia – sten in scales SPAS in comparison with the group of pupils with failing grades, pupils with excellent grades and chronically ill children

ES Kuliškova – ES Jelenia – sten in scales – math

Pupils with failing grades B	3,7
Pupils with failing grades G	3,3
Pupils with excellent grades B	7,6
Pupils with excellent grades G	8,2
Chronically ill children B	6,5
ES Kuliškova	5,79
ES Jelenia	4,89

Legend: ZŠ – elementary school, CH – boys, D – girls

Tab. 5 ES Kuliškova – ES Jelenia – sten in scales SPAS in comparison with the group of pupils with failing grades pupils with excellent grades chronically ill children

ES Kuliškova – ES Jelenia – sten in scales reading

Pupils with failing grades B	4,2
Pupils with failing grades G	3,3
Pupils with excellent grades B	5,8
Pupils with excellent grades G	6,9
Chronically ill children B	5,6
ES Kuliškova	3,93
ES Jelenia	3,87

Legend: ES – elementary school, b – boys, g – girls

Tab. 6 ES Kuliškova – ES Jelenia – sten in scales SPAS in comparison with the group of pupils with failing grades pupils with excellent grades and chronically ill children

ES Kuliškova – ES Jelenia – sten in scales orthography

Pupils with failing grades B	3,9
Pupils with failing grades G	3,5
Pupils with excellent grades B	7,7
Pupils with excellent grades G	6,8
Chronically ill children B	6,5
ES Kuliškova	5,58
ES Jelenia	5,32

Legend: ES – elementary school, b – boys, g – girls

Tab. 7 ES Kuliškova – ES Jelenia – sten in scales SPAS in comparison with the group of pupils with failing grades pupils with excellent grades chronically ill children

ES Kuliškova – ES Jelenia – sten in scales writing

Pupils with failing grades B	5,1
Pupils with failing grades G	4,9
Pupils with excellent grades B	6,4
Pupils with excellent grades G	6,5
Chronically ill children B	6,6
ES Kuliškova	5,4
ES Jelenia	3,35

Legend: ES – elementary school, B – boys, G – girls

Tab. 8 ES Kuliškova – ES Jelenia – sten in scales SPAS in comparison with the group of pupils with failing grades, pupils with excellent grades and chronically ill children

ES Kulíškova – ES Jelenia – sten in scales –self-confidence

Pupils with failing grades B	3,9
Pupils with failing grades G	3,3
Pupils with excellent grades B	7,8
Pupils with excellent grades G	8
Chronically ill children B	6,3
ES Kulíškova	5,12
ES Jelenia	3,35

Legend: ES – elementary school, B – boys, G – girls

Tab. 9 ES Kulíškova – ES Jelenia – sten in scales SPAS in comparison with the group of pupils with failing grades, pupils with excellent grades and chronically ill children

ES Kulíškova –ES Jelenia – sten in scales TS

Pupils with failing grades B	3,5
Pupils with failing grades G	3,2
Pupils with excellent grades B	7,7
Pupils with excellent grades G	8,5
Chronically ill children B	6,5
ES Kulíškova	4,58
ES Jelenia	4,59

Legend: ES – elementary school, B – boys, G – girls

Average measured rates of school self-assessment of the pupils with the specific learning disabilities were compared with average measured rates from the control group which consists of children with excellent grades, children with failing grades and chronically ill children (graph 1 - 8). We found out from the results that school self-assessment of the pupils with the specific learning disabilities is in comparison with school self-assessment of pupils – boys and girls with excellent grades significantly lowered as the authors were mentioned. We noticed the same result in the comparison with chronically ill children. In the scale Reading, the pupils with the specific learning disabilities show lower school self-assessment in the comparison with the boys with failing grades. Higher self-assessment of the pupils with the specific learning disabilities than the self-assessment of boys and girls with failing grades were found out in scales: general competences, Math, Orthography and in the total score. In the scale Reading, the pupils with the specific learning disabilities evaluated themselves higher only in the comparison with the girls with failing grades. In the scale Writing, the pupils with the specific learning disabilities from ES Jelenia reached the lowest self-assessment from the all compared groups. That means that pupils from ES Jelenia evaluate their Writing lower in comparison with the pupils from ES Kulíškova. The pupils from ES Jelenia show significantly lower level of school self-assessment in comparison with boys and girls with excellent grades, boys and girls with failing grades and also in comparison with standardized results of the chronically ill children. We noticed identical results in the scale self-confident. There is one difference that the rates of pupils from ES Jelenia are almost identical with the standardized rates of the girls with failing grades. We can state from the previous results that the pupils with the specific learning disabilities have lower self-assessment than the pupils with the excellent grades and also the chronically ill children, but they have higher school self-assessment than the pupils with failing grades.

Tab. 10 Average rates – rough score, sten in scales SPAS – Boys – Girls together

	Boys	Girls	l. sign.
HS1	2,74	2,25	0,669
S1	4,75	4,34	0,318
HS2	3,65	2,75	0,050
S2	5,51	4,64	0,060
HS3	3,44	3,91	0,271
S3	3,84	3,98	0,968
HS4	3,07	3,66	0,125
S4	5,67	4,93	0,016
HS5	3,46	4,91	0,002
S5	5,68	5,41	0,552
HS6	3,35	3,14	0,736
S6	5,30	4,84	0,212
TS	19,49	20,82	0,495
S	4,74	4,30	0,096

Legend: HS1-HS6 – rozgh score, S1 – general competences, S2 – Math, S3 – Reading, S4 – Orthography, S5 – Writing, S6 – Self-confidence, TS – total score, S – total sten, l. sign. – level of significance

In our research, we assumed that in the school self-assessment of the children with the specific learning disabilities will be significantly lowered in scale Reading.

In the table 3, we see average measured rates in particular scales of all boys and girls from ES Kulíškova and ES Jelenia. Statistically significant rates were reached in scales Math and Orthography. The lowest average rates reached girls and boys in the scale Reading. The difference in the total score between boys and girls from both schools were minimal, but boys reached better score than girls and that means in the practice that boys have higher school self-assessment than girls, but it is only minimal.

In the scale Reading, the pupils with the specific learning disabilities reached the lowest rates (graph 4) in comparison with the standardized rates among the girls with excellent grades, boys with excellent grades, chronically ill children and boys with failing grades. The group of the girls with failing grades results in the scale Reading even lower school self-assessment than the group of the pupils with the specific learning disabilities. Boys and girls with the specific learning disabilities (tab. 3) reached in the scale Reading the lowest reached rates. It means that they have problems in this area and they negatively judge their reading performances. The research also shows that older and younger pupils with the specific learning disabilities evaluate their reading competences very low in the scale Reading in comparison with authors of the questionnaire. Realized research also shows the reality that average measured rates of the pupils educated in the inclusive environment are the lowest in the scale Reading. The average rates in the scale Reading were also the lowest among the pupils with the specific learning disabilities integrated in the common class and also among the pupils in the special classes for the pupils with the specific learning disabilities. The exception is formed by the pupils from the special classes for the children with the dysphasia. They show the lowest average rates in the scale General competences. In generally, we can state that the school self-assessment of the pupils with the specific learning disabilities is very low in the scale Reading.

In the case of the rate of mathematical competences, we assumed that in the scale Math will be the level of the school self-assessment of the pupils with the specific learning disabilities significantly lowered. The pupils with the specific learning disabilities (graph 3) evaluate their mathematical competences and successfulness in this subject significantly low in comparison with boys and girls with excellent grades. The same average rates show also in comparison with the chronically ill children. In comparison with boys and girls with failing grades, the pupils with the specific learning disabilities reach better

average score. That means that the pupils with failing grades (boys and girls) show lower school self-assessment in the scale Math in comparison with the pupils with the specific learning disabilities. The difference between average measured rates of boys and girls with the specific learning disabilities in the scale Math is in favour of boys. Boys evaluate higher their performances in Math in comparison with the girls with the specific learning disabilities. In the comparison of the boys with the specific learning disabilities from both participated schools (ES Jelenia, ES Kulíškova) was found out a statistically significant difference in favour of the boys from ES Kulíškova. It is very possible that some from the special class from ES Jelenia consists of mainly boys with dyscalculia and with another specific learning disability. In comparison of the girls with the specific learning disabilities from both schools, the better score have the girls from ES Jelenia, but they did not reach statistically significant rate. Statistically significant difference was measured between younger and older pupils with the specific learning disabilities from ES Jelenia in favour of younger pupils.

The statistically significant difference was measured in the scale Math between the pupils with the specific learning disabilities integrated in the common class in ES Kulíškova and the pupils with the specific learning disabilities integrated in the common class in ES Jelenia. In this case have the pupils from ES Kulíškova better results. The statistically significant difference was also found out between the pupils from the special classes from ES Kulíškova and the pupils integrated in the common class from ES Jelenia in favour of the special classes. In the case of the comparison between special classes for the pupils with the specific learning disabilities from ES Kulíškova and the special classes for the pupils with dysphasia from ES Jelenia, there were statistically significant higher average rates among the pupils from the special classes for the pupils with the specific learning disabilities from ES Kulíškova. In this case, the low school self-assessment of the pupils with the dysphasia was formed because of this disorder. We can state that the pupils with the specific learning disabilities evaluate better their mathematic competences and knowledge when they are educated in the special classes for these pupils.

It results from the showed average measured rates that in the scale Math, the pupils with the specific learning disabilities have lower self-assessment than the chronically ill pupils and the pupils with excellent grades, but they have higher self-assessment than the pupils with failing grades

3 Conclusion

Self-confidence and the confidence in own abilities is important during school activities and even more in the life of individual at all. The results of the research confirmed the premise that school self-assessment of pupils with the specific learning disabilities is in all scales of the SPAS low. Pupils with the specific learning disabilities evaluate their school performances similar in comparison with average measured rates of excellent prosper pupils and also with chronically ill children. The research shows that pupils with the specific learning disabilities educated in special classes of elementary schools have higher self-confidence and school self-assessment. They evaluate higher mainly their general intellectual abilities, brightness and readiness and they also evaluate more positively their performances in Math than pupils educated in common classes. Pupils, which are educated in a special class with other schoolmates with similar difficulties and have similar problems, feel more self-confident and have a chance feel a success more often than in a common class with pupils without this disability. The education of pupils with the specific learning disabilities in a special class with the Individual Education Plan, such as the education of integrated pupils in common classes, would be the solution of problem mentioned by Sternberg. In case the results of researches about the self-assessment of pupils will reach similar rates like in our research in the favour of education of pupils in special classes, it is not possible to definitely agree with the opinion. The integration of pupils with

the specific learning disabilities would be successful in the case when the measured rates would be in favour of the integrated pupils. In that case we would consider the education in special classes as a brake in the remedy of the special disability. It is important to build the confidence in themselves and the feeling of unique in these children. It is also important to teach them accept failures and motivate them to the remedy not only by comparing with a more successful schoolmate.

The results of the research prove the lowered school assessment of the pupils with the specific learning disabilities. The tendency of these pupils to satisfy the need of self-realization by not always appropriate mean should be a memento for each teacher and expert, who works with the child, that he should try to change approach to these pupils. The change of the approach in practice means that we should not judge and evaluate pupils because of their school performances, but we should look for the unique of the personality in each of them and cultivate a joy from activities in which they are successful.

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Primary Paper Section: A

Secondary Paper Section: AM

THE INFLUENCE OF AGE AND GENDER ON CUSTOMERS' EXPECTATIONS TOWARDS MARKETING COMMUNICATIONS

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Nowadays customer relationship management approaches try to strengthen the relationship between providers and customers, but the expectations of customers are often completely ignored. Hence, marketing communications for services should be more customer-centric to be able to cope with the increasing and changing requirements of today's consumers. Within the lifetime of the customer relationship, characteristic phases represent different states of the relationship from a customer's perspective. Due to the different phases, management tasks for customer retention differ (Stauss, 2011, p. 320). But furthermore, other aspect influence customer expectations towards marketing communications. Two important aspects are the age of a hotel customer and secondly, the gender. Men and women have different interests and preferences, which should be taken into consideration. Furthermore, the age of customers influence their perception as well as their expectations.

Key words: customer relationship management, hotel industry, marketing communications

1 Introduction

The purpose of this paper is to discuss the influences of age and gender on hotel customers' expectations towards marketing communications. These aspects are assumed to be necessary to be taken into consideration by hotel marketers. One main aspect, which influences customers' expectations, is customer lifetime. Customer lifetime is defined as the timeframe between the first and so far last purchase of the customer and represents the length of relationship. Thus, the length of the customer provider relationship influences customers' needs and expectations. The CALI model analyses these changes in expectations of customers in different customer relationship lifecycle phases (Heiden, 2013). Hence, the two factors age and gender should be examined to find out, if an additional impact exists.

2 Theoretical Framework

"All business is based on relationships. The firm only has to make them visible and meaningful for its customers – provided that the customers want that" (Grönroos, 2007, p. 24). A company's ability to increase turnover through effectively managed customer relationships is crucial to overcome the uncertain economic outlook worldwide. The new characteristics of digital media, in combination with the huge number of alternative ways of communicating with customers, has created opportunities as well as problems for managers and academics to cope with (Winer, 2009, p. 116). For successful customer relationship management, hotel companies require more sophisticated guest segmentation and communication strategies than ever before, due to highly competitive markets, experienced and demanding customers and the specifications of the service industry. Therefore, traditional segmentation approaches are not able to cope with nowadays challenges in terms of efficient and successful marketing communications. The development of customer relationships and the increase of customer retention are usually regarded as strategic corporate goals, but a differentiation in terms of changing customers' expectations is seldom accomplished and the customer's perspective is ignored. Companies must take customers' perspective and have to understand their wishes and requirements to be successful. Mass marketing is no longer appropriate. Customer-orientated and individualized multi-channel dialogue marketing is necessary for the service industry. Decades ago it was enough to sell products and services due to the excess in demand. Nowadays customers are more pampered and expect service companies to offer additional services that are able to satisfy their individual needs (Wiesner and Sponholz, 2007, p. 76 f.).

Companies have to design appropriate communication models for strengthening the contact and relationship with their customers in an effective way. Effective refers also to value creation. The mode of communication should influence value

generation in a way that it adds maximum benefit to the relationship. Relationships between the parties develop incrementally and not all individual relationships between customers and companies are comparable. The stage of relationship reflects the need and expectation of each individual customer, because value generation activities should be based on the stage of relationship. At the beginning of a relationship, interaction and participation is less important, because the contact and knowledge is rather superficial. Since a relationship evolves through various stages, on a higher level, the level of interactivity increases as well as the degree of need for participation. Value is captured though an increase in connectedness between the parties if both parties move closer together through the dialogue, as they get a better understanding of the offer and demand of the counterpart. Also customer feedback enables the relationship to move forward. Based on their personal needs and purchase frequency, customers have their individual relational pace (Grönroos and Lindberg-Repo, 2004, p. 233 ff.).

The length of the hotel customer relationship with the hotel was found to influence the communicational expectations of customers. The longer the relationship, the more emotional content in marketing communications is appreciated. Additionally, the importance of information and offers in communication was found to decrease over time. Repeat guests, who are loyal with a hotel company over years, are more interested in exclusive emotional communication messages than in pure price information or information about the product. They already know the product very well. Contrariwise, new guests rate the importance of price and product information very high at the beginning of the relationship (Heiden, 2013). Since the results were significant, but the correlation were moderate, additional influencing factors must exist. Two factors, which can be assumed to influence customers' expectations towards hotel marketing communications additionally, are customers' age and gender. Basically, women are considered to be more emotional in general. Thus, it can be assumed that women perceive emotional content more important than men. Furthermore, men are more interested in pure and clear information. Hence, it can be assumed that men rate price and product information more important. Regarding the age of customers, the assumption can be stated that older customers rate emotional content higher than younger customers. Furthermore, younger customers have less money and are more interested in price and product information.

Thus, the following main hypotheses can be postulated:

H1: The older hotel customers are, the higher is the need for emotional content in communication.

H2: The younger hotel customers are, the higher is the need for information and offer in communication.

H3: Female hotel guests rate emotional content more important.

H4: Male hotel guests rate information and offer in marketing communications more important.

3 Research results and discussion

3.1 Data Source and Analysis Design – methodology

To analyze the differences in age and gender of hotel customers, a questionnaire was used. The questions concerning marketing perception and expectations were integrated in an existing guest questionnaire of a European hotel group with about 30 hotels. Most of the hotels are also located in Austria, followed by Italy, Croatia, Czech Republic, Serbia and Slovakia. The portfolio of hotels is separated into wellness hotels (14 hotels), a luxury premium collection (three hotels), family hotels (8 hotels) and city hotels. The main focus is on leisure guests, but especially in the city hotels (four hotels in sum), business travellers play an important role (Falkensteiner, 2012). All transactional information concerning the hotel stay is stored in a multi-property management system. If a guest makes a reservation, this information is stored in the system, including all available

information concerning name, postal address, email address, arrival date, depart date, number of guests, room type etc. The information stored in the operative reservation system is transferred in an extra database for marketing purposes. Within the import process, data is cleaned and structured to be ready and appropriate for marketing communications. Two days after the departure, guests get a post-stay email. This email contains a "Thank you for your stay" message and the possibility to evaluate the hotel group and the previous hotel stay itself. If the hotel guests clicks on the link in the newsletter to open the questionnaire website, a personalized ID (alphanumeric) is transferred to link the questionnaire to the guest who fills it in. This enables a link between the questionnaire and the guest profile in the marketing database. After the guest has filled in the questionnaire and has clicked on "send", the results are saved and written back into the database. Hence, the information about the guest's evaluation of the stay and the hotel group can be linked to the guest's profile with segmentation and transaction information. To answer the research questions and to examine the postulated hypotheses, questions regarding the interest for marketing communication, the perceived importance of marketing communication as well as the desired content, were added to the post-stay guest questionnaire of the hotel group. An own part in the questionnaire, labeled "Marketing" was created, where all questions concerning marketing communication are stored. The questionnaire version including the marketing communication questions was sent out at the beginning of July 2012 for the first time. To have a representative time frame with a sufficient amount of responses, questionnaire responses were used from July to the middle of October 2012. Overall, about 24,140 guests arrived in total during this time frame in all hotels of the hotel group and had a correct email address available, where the questionnaire could be sent. A total amount of 2,816 questionnaires were filled in. This represents a response rate of 11.7%, which represents a relatively high quota. Since the hotels are located in different European countries and customers are rather international, the questionnaire was sent out in different language versions. It was available in English, German, Italian and Croatian. Corresponding to the language, which was saved in the reservation system of the hotels, the guests received the questionnaire. This facilitates the process, because guests did not have to choose the right language before starting to fill in the questionnaire. Demographical information about the guests was stored in the database. Since the results of the questionnaire were linked to the guest profiles, the age and gender for each responding guest could be used for analysis.

3.2 Results

Based on the results of the main research, which was focused on the differences in expectations in different customer lifecycle phases, the additional factors were examined. These other aspects may be included in the communication model in the future, because based on the results it seems probable, that more factors influence the changes in marketing communication expectations than only the customer lifetime. The first analyzed factor, which may possibly influence customers' expectations was customers' age. Thus, the relation between age groups and the answers of marketing question 5 (desired communication content) were analyzed. In this question, guests had to decide, what would be the most important content in the next communication message for them. Guests had to decide between "offers and packages", "exclusive news" and "relevant information". "Offers and packages" represented the price information, "exclusive news" the emotional aspect and "relevant information" the product information. Guests had to decide between the aspects. Thus, they really had to think about the most important aspect in communication personally for them. It was not possible to choose two out of three. The next table shows the results per marketing content and age group. In the first column, guests without available age group are listed. The next column contains the values for age group 1 (age under 18), which can be considered as not representative due to wrong birthdates. This may happen if guests say not their true birthday during check in, or they do not say the year and the reservation clerk uses a dummy year to be able to complete the check in

process. Thus, the most representative columns are age group 2, 3, 4, 5. Guests in age group 6 are rather old and the dates may also be wrong, because the quota of guests over 80 is in general low and even lower, when considering the response medium email. Since the questionnaire was sent by email, the age group of over 80 may not be entirely representative, because only 4 guests are located in this group. Also group 1 is very small. Comparing the quotas of age groups 2 to 5 leads to insightful results.

Concerning offers and packages, the quota decreases constantly from group 2 to group 5 (from 65.8% to 47.1%). This means, that younger guests are in general more interested in offers and packages than elder people.

The analysis of "exclusive news" shows the opposite: The quota increases constantly from 13.6% (age group 2) to 23.7% (age group 5). This means that the older guests are, the more they are expecting emotional content in the communication. The same effect can be observed in terms of information: the quota of guests, who chose this aspect most important rises from 9.8% in group 2 to 15% in group 5. This also means that information gets more important, the older guests are. Hence, H1 and H2 are supported.

So concerning the communication model, this aspect should also be taken into consideration. If a hotel has in general a rather old guest base, the communication should be generally more emotional and informative instead of selling. Contrariwise, hotels with a younger guest base should try to deliver appropriate offers and packages, which are more appealing. The results should be combined based on the type of hotel and the guest structure with the results of the customer communication lifecycle considerations and the changes during customer lifetime.

Table 1: Contingency table of content of campaigns and age groups, Source: Survey data

		Customer age group						Total	
		No age group available	AG 1 - 18	AG 2 - 19 to 28	AG 3 - 29 to 40	AG 4 - 41 to 59	AG 5 - 60 to 80		AG 6 - above 80
No answer given	Count	4	4	20	89	184	47	2	350
	% within age group	6,1%	17,4%	10,9%	10,3%	13,7%	14,1%	50,0%	12,4%
Offers and packages	Count	36	11	121	504	706	157	0	1535
	% within age group	54,5%	47,8%	65,8%	58,5%	52,5%	47,1%	0,0%	54,5%
Exclusive News	Count	17	4	25	185	315	79	1	626
	% within age group	25,8%	17,4%	13,6%	21,5%	23,4%	23,7%	25,0%	22,2%
Relevant Information	Count	9	4	18	83	140	50	1	305
	% within age group	13,6%	17,4%	9,8%	9,6%	10,4%	15,0%	25,0%	10,8%
Total	Count	66	23	184	861	1345	333	4	2816
	% within age group	100%	100%	100%	100%	100%	100%	100%	100,0%

Since the contingency table contains all age groups, the Chi-Square test and Cramer's V was also accomplished with all available data. The Chi-Square test shows an association between the two variables with a high significance ($p = .001$).

Table 2: Chi-Square test for content of campaigns and age groups, Source: Survey data

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	43,787 ^a	18	.001
Likelihood Ratio	44,487	18	.000
N of Valid Cases	2816		

a. 6 cells (21,4%) have expected count less than 5. The minimum expected count is .43.

The results of the Cramer's V are not significant. To improve the results, guests without age group, age group 1 and 6 should be excluded from the analysis. Since the examination should only give ideas for further considerations and enhancement of the communication model, these adjustments are not accomplished in this research project.

Table 3: Cramer's V for content of campaigns and age groups, Source: Survey data

	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Ordinal by Ordinal Gamma	,031	,026	1,205	,228
N of Valid Cases	2816			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Another possibly influencing factor may be the guests' gender. Thus, the association of gender and desired marketing campaign was also analyzed superficially. The next table shows that of all female guests, 59.9% chose "offers and packages", 19.2% "exclusive news" and 8.3% "relevant information". 12.7% did not answer the question. The results of the male guests differ from the female answers, because only 50.3% chose "offers and packages", but 24.6% chose "exclusive news" and 13.0% "relevant information". This leads to the assumption that women are in general more interested in price offers and men in exclusive and emotional content, where they feel pampered, and also information is interesting.

Thus, H3 and H4 are not supported, because it was assumed that women are more interested in emotional communication and men are more interested in clear price and product information.

Table 4: Contingency table of content of campaigns and gender, Source: Survey data

		Gender of customer				Total	
		F	M	U			
content of campaigns	No answer given	Count	3	163	182	2	350
	% within Gender of customer		37,5%	12,7%	12,1%	13,3%	12,4%
	Offers and packages	Count	2	768	760	5	1535
	% within Gender of customer		25,0%	59,9%	50,3%	33,3%	54,5%
	Exklusive News	Count	1	246	372	7	626
	% within Gender of customer		12,5%	19,2%	24,6%	46,7%	22,2%
	Relevant Information	Count	2	106	196	1	305
	% within Gender of customer		25,0%	8,3%	13,0%	6,7%	10,8%
Total	Count	8	1283	1510	15	2816	
% within Gender of customer		100,0%	100,0%	100,0%	100,0%	100,0%	

The Chi-Square test shows a high significance ($p < .0001$) and furthermore the Cramer's V shows a weak, but existing correlation (Cramer's V 0.157). Thus, hotels should also take the gender of their guests, or especially the one who makes the booking decision into consideration. These results should only be considered in addition CALI model, which identifies the customer lifetime as crucial indicator for customers expectations (Heiden, 2013) and should lead to further research.

Table 5: Chi-Square test for content of campaigns and gender, Source: Survey data

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	48,064 ^a	9	,000
Likelihood Ratio	46,247	9	,000
N of Valid Cases	2816		

a. 7 cells (43,8%) have expected count less than 5. The minimum expected count is ,87.

Table 6: Cramer's V for content of campaigns and gender, Source: Survey data

	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Ordinal by Ordinal Gamma	,157	,031	5,077	,000
N of Valid Cases	2816			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Conclusion

The findings presented in this paper are only an extract from the comprehensive results of the empirical work. Within customer communication lifecycle of a hotel guest, the interest, needs and expectations concerning information, offers and emotions change. Hotel marketers should take these changes into consideration in the future. It was found out that not only customer lifetime representing the length of the relationship influences customers' expectations. Also hotel customers' age, as well as gender, have an impact. Interestingly, men are more interested in feeling pampered and exclusive. They appreciate to

feel special and are considered as a valuable guest. For women, this aspect is rather unimportant. They are more focused on the clear price information. Additionally, they are interested in information about the product and possible activities. Women are also interested in emotional content, but they do not rate this aspect equally important. Also customer age influences the results. As assumed, older guests like emotional content and want to feel special. They like the feeling that the hotel cares about them and that not everybody is treated the same. Younger guests are more interested in cheap prices and offers. Summarized, hotels should use the results to evaluate their communication strategy compared to their hotel product. If hotels have rather older guests, they should design their communication messages rather emotional. If a hotel has mainly young guests, a clear focus on prices, packages, offers and precise information is required. These results may lead to further research, how all these analyzed aspects can be ideally combined for a better fit of marketing communications in the hotel industry in the future.

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Primary Paper Section: A

Secondary Paper Section: AE

EQUAL APPROACH TO STUDYING WITHOUT BARRIERS IN UNIVERSITY ENVIRONMENT FOCUSED ON THE UNIVERSITY OF OSTRAVA

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Grant: The Support of Tertiary Education of Students with Special Educational Needs at the University of Ostrava (reg. no. OP VK CZ.1.07/2.2.00/29.0006), ESF OP VK

Abstract: The following article outlines the system of tertiary education in the Czech Republic, with emphasis on the education of students with special educational needs at the University of Ostrava. It informs about the progress of the project The Support of Tertiary Education of Students with Special Educational Needs at the University of Ostrava (reg. no. OP VK CZ.1.07/2.2.00/29.0006), its outputs and mechanisms supporting equal education. The aim of the project is creation of inclusive university environment that is ready to accept students with special needs. The text thus presents the process of innovation of study conditions for all students, but with full respect to a priority requirement, which is the completion of a studied subject in the scope given by proper accreditation.

Key words: tertiary education, student with special educational needs, college, university, integration, inclusion, projects, innovations in education.

1 The University Education in the Czech Republic

International Standard Classification of Education (abbr. ISCED) was prepared and issued by UNESCO in 1976. In 1997 the General Conference of UNESCO approved changes concerning the level of education and also the field of study. The classification of ISCED from 1997 has 7 levels of education (0 to 6), which can further have an internal structure from A to C. In our conditions the levels ISCED 5 and ISCED 6 represent university education comparable to other countries. In the Czech Republic as in other countries (e.g. Slovakia, Poland) since 2001 has existed structured three-level university education. By that the level shows the reached degree of education. The first degree of education is the bachelor's study, the second degree of education is the master's study and third – the highest degree of education is the doctoral study. The number of active students at all levels of university education is increasing every year. In 2001 there were about 203 500 registered students, in 2010 there were already 396 300. The highest share has the bachelor's study – 62 % of students, followed by the subsequent master's study – 22 % of students, then master's unstructured study (preserved in selected subjects, e.g. General Medicine, Teaching for Primary Schools) – 10 % of students, and doctoral students represent total of 6 % of students registered in 2010. (CZSO, online) At the university the education is implemented in three forms – full-time, combined and distance.

Education is provided by state (2), public (26) and private (44) universities. If higher vocational school obtains an appropriate accreditation for given field of study of university education, it can provide the university education in this subject (usually it concerns the first degree). The accreditation to all schools is given by the Ministry of Education, Youth and Sports of the Czech Republic. The Accreditation Commission of the Czech Republic is an independent council that deals with the quality of university education. For this purpose the Accreditation Commission carries out comprehensive assessment of educational, scientific, research, artistic or other creative activities of universities. (AC, online)

2 Education at the University of Ostrava

The University of Ostrava is one of the 26 public colleges in the Czech Republic having the status of a university. It has 6 faculties (Pedagogical Faculty, Faculty of Arts, Faculty of Medicine, Faculty of Science, Faculty of Fine Arts and Faculty of Social Studies). Individual faculties offer subjects of bachelor's, master's or doctoral degree. The University of Ostrava has been awarded the prestigious European certificate, which demonstrates that the school teaches on the same

principles as traditional European universities. It is the ECTS Label Certificate and it is awarded by the European Commission. In 2012 at the University of Ostrava 10 637 students studied in bachelor's, master's (long and short) and doctoral programmes. 70 % of students studied the bachelor's programmes and subjects (out of which 69 % were in full-time programmes, and 29,3 % in combined programmes and 1,4 % in distance study programmes). 6,9 % of students studied long master's programmes, the number of 20,1 % students studied in subsequent master's programmes (out of which 73,9 % of students in full-time programmes and 26,1 % of students in combined ones). 3,4 % of students studied in doctoral programmes. At the University of Ostrava study in total 68,6 % students in full-time programmes, and 27,9 % of students in combined programmes and distance ones. (Annual Report of the University of Ostrava, online 2013)

3 On the Way to Inclusion in the Education at the University of Ostrava

The society approached people with disability in different ways in particular historical periods, usually the tendencies cannot be judged positively. An equal approach to people with disability did not mean a lot to the intact society. Even today, this topic is rather ambiguous. There are still ongoing expert discussions about the scope and methods of ensuring equal approach towards people with disabilities, both in the general social, educational and professional, as well as in the family context. Many questions have not been answered yet. The specialists explain the term "equal approach" variably, inconsistently, sometimes even ambivalently. Perhaps only because it is about relativism, and also because, with respect to the subject of interest of the special pedagogy, it is necessary to perceive the person (with or without disability) in an individual way. About the concept of inclusive education in relation to pre-school education, primary and secondary levels of education, we can find quite a number of research studies of domestic or foreign origin. The tertiary level of education with respect to special educational needs of students with disability is scientifically explored only a little. In the following paragraphs there are outlined the realized research and developmental activities, in which the authors of the text were participating actively or they are still participating and on which they build the way to inclusion, i.e. the way to equal approach in the education of students with special educational needs.

In the academic year of 2012/2013 a total of 34 students with special educational needs studied at all faculties at the University of Ostrava. For a long time the authors of the article have been engaged in research and developmental projects, where the target group consists of children, pupils and also students with special/specific educational needs. Between years 2008 - 2011 at the "Centrum Pyramida" ["Pyramid" Centre] - the centre of support for students with special educational needs – they worked or co-worked on developmental projects focused on supporting the integration of students with health disabilities. In 2010 they dealt with a research called "Education of Pupils with Special Educational Needs from the Perspective of Frame Educational Programmes", it was followed in 2011 by further research project called "Analysis of Key Determinants Influencing the Process of Education of Children, Pupils and Students With Special Educational Needs in the Context of Frame Educational Programmes." In 2012 they worked on a research with the topic "Analysis of Determinants Influencing the Education of Students With Special Educational Needs at the University of Ostrava." The last mentioned research project was done parallel to currently running developmental project from European Structural Funds within the Operational Programme for Competitiveness (2012 – 2015) with the name of "The Support of Tertiary Education of Students with Special Educational Needs at the University of Ostrava" (registration number: CZ.1.07/2.2.00/29.0006). It is a university project, in which all the faculties are involved. The project concept is based

on the philosophy from the Convention on the Rights of Persons with Disabilities, based on the Act no. 198/2009 Coll., on Equal Treatment and on Legal Means of Protection against Discrimination and on Amendment to some Laws. It is in accordance with the Charter of Fundamental Rights of the European Union, which explicitly prohibits discrimination against the disabled. Further it follows the National Plan for the Creation of Equal Opportunities for People with Disabilities for 2010 – 2014, which states a claim that a person with health disability is offered a reasonable modification according to individual needs and education. It is also in accordance with the National Action Plan on Inclusive Education, which was approved by the Government of the Czech Republic in 2010. In the specific strategic objectives in the sphere of education in the Long-Term Strategic Plan of the University of Ostrava for 2011 – 2015 there is besides other things mentioned an active support for students with specific needs. A practical objective of currently solved developmental project “*The Support of Tertiary Education of Students with Special Educational Needs at the University of Ostrava*” is a creation of supportive measures to equal education so as the modifications of study and educational procedures come out of evaluation of specific needs of a student with special educational needs, not from the nature of their health disability. The implementation of the project counts on coordinated cooperation of academic and other university staff. Its contribution is structured into 5 key spheres: innovation of study programmes, fields of study and subjects, increase of professional competences of academic and other staff, implementation of a system monitoring the needs of the labour market for the graduates, architectural accessibility of buildings for students with special educational needs and creation of an inclusive environment.

The starting point of the key activities included in the project is a principle that *the university is obliged to accept a student with specific needs, if the possible adaptation of study does not prevent the graduation in the studied field in the scope given by proper accreditation, only with modification of formal (technical and organizational) side of the study.* The primary aim of the wide research team is to find out and verify the possibilities and circumstances of the adaptation of study for students with specific needs. For this purpose the strategy of innovation of study subjects in the selected field of study was chosen. The basic principles of innovation are based both on respect to the demands of the university for graduating particular subject, and also on the respect to special educational needs of students with health disability. The scope of specification of special educational needs of a student and of studying conditions including their possible modification is due to the variability of symptoms of health disability individual and it is based on number of factors, not only the type of disability and the content of a study plan. The university education in addition puts a considerable demand on a student in the sphere of social and speech communication, work with written texts, work with symbols and graphics, multimedia work (audio-visual materials), demands on the usage of technologies, or working with physical material during lessons and while studying, etc.

The precondition for creation of equal opportunities to study and at the same time the central philosophy of this project is the understanding of the term “special educational needs”, the understanding that every person with health disability needs individual level of help or compensation for satisfaction of basic human needs, where the need for education belongs as well. This help, however, does not mean any exceptional need, but a set of measures that lead to enable access to the possibility of fulfilment and realisation of one’s basic needs. By the set of measures is understood a summary of service activities provided by the university, which arise from the requests for functional diagnostics according to the currently valid typology of students with special educational needs.¹

¹ The Rules for Provision of Grants and Subsidies to Public Universities by the Ministry of Education, Youth and Sports, no.MŠMT-1325/2012-33 from January 17th, 2012, specifying the financing of the increased costs for education of students with specific needs.

The service measures include, e.g. access to study literature, recording / visualization services, interpreting services, individual education, study assistance, personal assistance, spatial orientation training, diagnostics, overhead measures, time compensation, etc. To make the university accessible for people with health disability requires to create environment, which is characterized by understanding the differences of students, by the atmosphere of perception and empathy in the relation to special educational needs of students arising from the presence of disability, as well as to create an easy-access (communicative, informative, architectural). During education further basic needs of human must be also satisfied, i.e. the sense of security, belonging, mutual respect, which are not defined by any directive or decree, but which belong to the set of supportive measures inseparably. Equal opportunities can be created only by mutual active approach both from the side of students with specific needs, and also from the side of the university. The Centre of Support for Students with Special Needs (“Pyramid” Centre) has the coordinating role in the whole process at the University of Ostrava. The aim of accessibility of education is not to create a “greenhouse environment”, in which we would create the barriers, but to modify conditions of entrance examinations, study conditions and study environment so as on the contrary we can break down the barriers. The parts of the project are thus mandatory courses to increase personal and professional competences of academic and non-academic staff of the University of Ostrava.

4 The Innovation of Fields of Study at the University of Ostrava

The project involves the staff of all the faculties of the University of Ostrava, while the innovation concerns mainly fields of study resulting from the internal analysis for education of students with special educational needs at the University of Ostrava. Those are e.g. the fields of study like Teaching for Pre-Schools (Pedagogical Faculty), Teaching for Primary Schools (Pedagogical Faculty), Special Pedagogy (Pedagogical Faculty), Information Technology (Pedagogical Faculty), Pedagogy (Pedagogical Faculty), Social Pedagogy (Pedagogical Faculty), Applied Information Technology (Faculty of Science), Physiotherapy (Faculty of Medicine), Occupational Therapy (Faculty of Medicine), Medical-Social Care (Faculty of Social Studies) and others. The internal analysis was done before submitting the project application and so it also became a motivating and supporting material for creating the project.

The aim of the key activity focused on innovation of the studying subjects is the adjustment of studying and educational procedures based on evaluation of specific needs of a student with special educational needs, not on the nature of their health disability. It is necessary to stress that the features of the innovation of studying and educational procedures including the demands of students with special educational needs are of inclusive nature because at the same time they can improve educational possibilities of all students at the University of Ostrava. Innovated subjects will be offered to students as substituting or supportive.

A substituting subject (compulsory or compulsory elective) considers a modified structure of completing the subject, which is a part of the studying plan. The modification must not change the *aims and the content of the subject or the obtained qualifications*. On the contrary, the modification is expected in the *requirements for a student* (solely from the organisational, technical and material perspective, not as regards content)², *educational methods, assessing methods and categories of studying*, which means all the activities a student performs to reach the studying output. We must always take into account adequate and acceptable modifications in accordance with the conditions for completing the subject. For example an oral exam of a student with strong hearing impairment would take place with the presence of an interpreter into the Czech sign language,

² What a student must do to meet the requirements of the subject (lecture participation, continuous fulfilling of correspondence tasks, handing in an essay, etc.)

a student with strong visual disability obtains the credit through verbal presentation, conversely, in the case of a student with strong hearing impairment through written task fulfilment. Other possible modifications include increasing the amount of time for fulfilling tasks, studying assistance services, personal assistance services, the usage of special tools, the adjustment of the environment, etc.

A supportive subject (elective) means creating a new subject that a student chooses to be able to meet the requirements of the studying plan (e.g. a student with strong hearing impairment chooses a subject focused on teaching Czech language in order to understand the terminology of the given field, etc.).

The outputs of the key activity focused on the innovation of subjects also include modified educational documents closely related to the innovated subject (see table no. 1). Studying support in a digital form accessible to all students takes into account a large amount of possible demands (even before they are claimed by individual students). It is a desirable non-discriminating approach that the universities should consider a part of the anticipation of the requirements of students with special educational needs. If the subject contains e-learning features (e.g. the lecture takes place in a virtual environment), it must be accessible for all the students of a specific subject or such an adjustments must be implemented that enables the students with disability to access equivalent educational opportunities (e.g. for a student with strong visual disability). During the project a pilot testing will be done on 20 innovated subjects within those fields of study, where students with special educational needs are currently studying. Their participation is necessary in order to identify possible obstacles in studying and evaluating innovated subjects.

The Outputs of Key Activity	No. of Products
Innovated subjects for students with specific educational needs (SEN)	100
Innovated subjects for students with SEN tested in pilot testing	20
Studying support in electronic form	100
E-learning courses	35
Adaptation of courses (educational CD)	35
Adaptation of courses (educational DVD)	35
Methodical recommendation for further creation of the innovation of subjects	
Methodical recommendation for following accreditation and reaccreditation processes of chosen fields of study	

T1: The overview of the outcomes of key activity focused on the innovation of the field of study

5 Other Mechanisms to Support Inclusive Education at the University of Ostrava

The key activity focused on increasing professional competences of academic and other staff of the university aims to prepare the staff to possible difficulties that students with special educational needs and also the staff involved with them meet. One of the outputs is the course Students with Special Educational Needs at Universities (K1), a course focused on methodological preparation of lectures and the creation of presentations using modern technologies (K2), Sign Language Course – beginners (K3), Sign Language Course – advanced (K4), a course supplemented with practice or fellowship in chosen workplaces, focused on modification of electronic texts for readers with visual disability and also focused on work with digital library for students (K5) and a Course of Personal Assistance (K6). The aims of the activity are based on the precondition of the necessity of increasing the competence of the university staff in the sphere of communication with individuals with health disability. It involves gaining information, pieces of knowledge and competences.

Course	K1	K2	K3 ³	K4 ⁴	K5	K6
No. of successfully supported staff members	79	78	8	8	81	taking place in winter term 2013

T2: Courses for the university staff

The system of monitoring the needs of labour market provides the university graduates with published works and conference outputs. Empirically there is investigated the monitoring and work success of students with special educational needs with regard to current trends in the employment policy. It involves updating the *Methodology of Support and Balancing the Conditions during Studying of Students with Special Educational Needs at the University of Ostrava* (the latest version in 2012), with methodological recommendation to provide occupational fellowships of students with special educational needs and students with socio-economic disadvantage. The point is to strengthen their competitiveness. The completion of these partial steps results in the creation of a list of fields of study suitable for candidates with special educational needs at the University of Ostrava, a report about the possibilities of success of students with special educational needs at the labour market after they graduate from the chosen field of study and methodological recommendation for realisation of fellowships of students with special educational needs at the University of Ostrava.

Students with special educational needs (minimum of participated so far)	Students with socio-economic disadvantage (minimum of participated so far)
5/1	5/2

T3: Students' occupational fellowships

The presence of no barriers in education is ensured by building modern easy-access elevator in the historic building of the university, by installing two platforms for wheelchairs and also by web interface called Inclusive Environment, which aims to start and support communication of people at the university. The staff (academic and other members) and students (intact, and with disability) at all the faculties are motivated to actively communicate with each other about topics solving equal approach in education and various life situations connected with this problem.

Inclusive environment (web interface)	No. of registered users
Students with special educational needs	13
Intact students	746
University staff	43
Total	802 ⁵

T4: The number of registered users in the Inclusive Environment

The Inclusive Environment offers communicational panel "Ask us", where students with special educational needs are logged in using their personal profiles. This enables an open communication with students who showed willingness to share their personal experience. The panel "Stories" contains five sections (My Family; Something I Would Like to Tell Others; A Person With a Disability Can Study at a University; The Importance of Volunteering; My Experience with the Disabled), that offer categories of contributions of those students or university staff members who wanted to share their own or interpreted life stories. Discussion panel contains altogether 5 topics focused on fighting prejudices and stereotypes, it also focuses on the problems of education of students with specific learning disability, equality in education, etc.

6 Conclusion

We face the problem of integrative and inclusive education of persons with health disability at all educational levels. The academic community should observe current development and react adequately. We can expect a continuous increase in the amount of active students with specific educational needs (SEN). The University of Ostrava is on the way to equal approach – to creating inclusive environment for students with special educational needs. Thanks to the realisation of research and developmental projects it creates equality in the system of tertiary education. However, the necessary mechanism of inclusion is the coordination of all the bodies taking part in both direct and indirect pedagogical activity, administrative agenda, related to the course of the studying of intact students as well as students with special educational needs. The necessary part is the

³ Will be repeated in the following academic year.

⁴ Will be repeated in the following academic year.

⁵ As at a date of August 18th, 2013.

still developing tool of the support of personal and professional competences of all the staff at the University of Ostrava in the approaches (attitudes) to people with health disability (e.g. courses focused on assistance, adaptation of studying materials, sign language, etc.). At the same time it is necessary to create a system offer of the above-mentioned tools for all the students at the University of Ostrava. Even though the process of creating inclusive university environment at the University of Ostrava has already started, the length of its track is not given as it is a continuous and complex activity aiming to change studying environment and conditions.

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Primary Paper Section: A

Secondary Paper Section: AM

INVESTMENT DECISION MAKING BASED ON THE SIMULATION METHOD

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The paper is prepared under the aegis of the grant scheme VEGA No. 1/0765/12 Research into possibilities and perspectives of employing traditional and alternative approaches in financial management and financial decision-making in the changing economic environment. Its preparation is also due to a partial fulfilment of the Operational Program Education project ITMS 26110230082 Mobility – Support of Science, Research and Education at Matej Bel University in Banská Bystrica (Mobility – podpora vedy, výskumu a vzdelávania na UMB) co-financed by the European Social Fund within the bounds of financial subsidy contract No. 018/2012/1.2/OPV.

Abstract: In preparing financial plans as part of the investment decision making process it is necessary to integrate risk and uncertainty resulting from unpredictability of key factors of investment planning. The paper is devoted to applications of the Monte Carlo simulation method as one of tools that explicitly allow for risk in the investment decision making process. The simulation method provides an interval of possible outcomes for the key factor that shapes the decision making (such as the net present value) and measures risk of the investment project on the basis of an at-risk measure. Usage of the simulation method is clarified by dint of a model and real example in which a decision about feasibility of the investment project is made.

Key words: Net present value. Monte Carlo simulations. Risk factors. Probability distribution.

1 Introduction

Deciding on capital investments as well as capital project implementations requires a thorough comparison of expenditure associated with, and revenue generated by, the respective investment or project. One of the basic criteria that is utilized throughout financial theory and practice in assessing the adequacy and profitability of a project is the criterion of net present value (NPV). NPV is defined as the surplus of discounted revenue generated by the project over discounted expenditure spent for the project, whilst discounting is done so as to reflect the desired rate of return. Expressing NPV as a single number does not permit to capture risk stemming from uncertainty in the future development of key factors that influence the very figure embedded in NPV. Of appropriate use in investment project decisions is not only the knowledge of NPV that fully mirrors anticipations and estimates that are formed prior to the implementation of projects but of great import is also the knowledge of risk that is inherent in NPV. One of the approaches to measuring risk of the project and evaluating sensitivity of the project outcomes is founded on the Monte Carlo simulation method, whose practical application and demonstration is the content of this paper. Facilitated by a case study, the paper expounds the idea of Monte Carlo simulations and their usability in deciding on a project as a sequence of four steps: (i.) mapping of cash flows through a mathematical model into the criterion of NPV, (ii.) identification of risk factors and determination of their probability distribution, (iii.) Monte Carlo simulation of possible outcomes, and eventually (iv.) computation of risk measures tied with the project, on which basis riskiness of the project can be responsibly judged and the decision on acceptance or rejection of the project made.

The paper is organized into three core sections, neglecting the obligatory introduction and conclusion. Whilst, in the ensuing section, the procedure of the Monte Carlo method is outlined; the other two sections expound on the details and results of the case study that is included in the paper.

2 Monte Carlo simulations

There are several approaches to quantification of factors influencing the success of a project, and these in some manner depict uncertainty of future events. To this end, of relatively frequent use is the simple method of sensitivity analysis. Sensitivity analysis seeks to measure sensitivity of the chosen criterion under various scenarios in the development of risk factors. These scenarios are formulated in order to capture different states of the world and include usually a pessimistic

variant, a (most probable) medium variant as well as an optimistic variant of the future development of risk factors. This method is fairly simple but it associates itself with ambiguity in the understanding of (the likelihood of) the pessimistic or optimistic variant and another its shortcoming is that it neglects possible dependencies of risk factors and does not attempt to model a different level of uncertainties that are inherent in them (cf. Hnilica and Fotr, 2009, p. 34). The way how sensitivity analysis results are handled is, as a matter of fact, in the hands of the corporate managers, being his subjective choice, and their interpretation crucially depends on his risk preferences (cf. Cisko and Klieštík, 2013, p. 80).

These drawbacks are meliorated to great extent by the Monte Carlo simulation method. Under this method of simulation, a large number of potential scenarios are generated for individual risk factors respecting correlations or relationships in their development. For each scenario, the value of the target criterion is determined and all simulated values are a good approximation of its probability distribution provided the number of Monte Carlo simulation is sufficiently large. The Monte Carlo method requires specification of the marginal probability distribution of individual risk factors and their dependency structure but makes not attempt at expressing their joint probability distribution analytically. The construction of the joint probability distribution of risk factors is substituted by the generation of pseudo-random draws from it (naturally, in the way that the marginal distributions together with the dependence structure are accounted for). Each draw represents a potential scenario of the future state of the world and this interpretation makes it sensible that the desired criterion is evaluated with respect to each scenario so as to arrive at the resulting outcome under the given scenario. Having a sufficiently high collection of these potential outcomes is equivalent to having the underlying probability distribution of the target criterion. In the setting up of this underlying probability distribution, non-parametric methods of statistical analysis are employed and demanded theoretical quantities (such as quantiles or moment characteristics) are computed empirically. Examples of risk measures that are computed in this fashion include standard deviation, value at risk (or other "at risk" equivalent), expected shortfall. To make this procedure workable, it is necessary both to specify the marginal probability distribution of individual risk factors and estimate its parameters, and then to describe duly the dependence structure between parameters and to estimate parameters that are the result of such a description.

Respecting the exposition by Hnilica and Fotr (2009, p. 71), the methodological procedure of Monte Carlo simulations can be structured in these few steps:

- the construction of a mathematical model, through which the target criterion is expressed as a functional of various (deterministic or stochastic) input variates,
- the determination of key risk factors, i.e. input variables that significantly influence uncertainty of the target criterion and determine its value,
- the determination of probability distribution of risk factors,
- the definition of dependence structure between risk factors, possibly through an ancillary statistical model,
- the very process of simulation,
- the graphical and numerical evaluation and presentation of the achieved results.

This procedure is clarified by means of a case study whose basic inputs are borrowed from Brealey et al. (2008, pp. 271-283).

3 Outline of the case study

Brealey et al. (2008, *ibid.*) in their publication consider an investment project of the Otobai Company in Osaka, Japan on launching of an electrically powered motor scooter for city use. The project requires initial investment of ¥ 15 mds. and is scheduled for the following 5 years with no terminal value at the

end of Year 10. It is assumed that revenue for each of Years 1 – 10 are determined by the market size (measured by the number of electric scooters sold), the market share of the Japanese company and by the selling unit price, which is alongside the market size and the market share an exogenous variable difficult to influence for the company. The market size and the market share determine the number of scooters sold by the company. Besides the number of scooters sold, cost of the project is each year influenced by variable cost as well as fixed cost, the extent of which is affected by the current situation at the market. Annual fixed cost also comprises the depreciation of the initial investment calculated over the 10-year period on a straight line basis. Annual profit of the project can be represented by the equation

$$\text{profit} = \text{market size} \times \text{market share} \times \quad (1)$$

$\times (\text{unit selling price} - \text{unit variable cost}) - \text{fixed cost}$
is taxed at a rate of 50 %, which is predicted to remain stable for the entire 10-year period. Under these considerations, cash-flows associated with the project can be annually described by the relationship

$$\text{cash-flow} = \text{profit} \times 0.50 + \text{depreciation} \quad (2)$$

It is operated with the 10 percent return of the capital (at the discrete model of compounding of interest), and therefore the criterion of NPV (expressed in ¥) is given by

$$\text{net present value} = -\text{¥}15\,000\,000\,000 + \sum_{t=1}^{t=10} \frac{\text{cash-flow in year } t}{1.10^t} \quad (3)$$

A thorough analysis of factors affecting NPV in (3) yields that the source of risk imposing uncertainty upon NPV calculations are the market size, the market share, the unit variable cost as well as the fixed cost (without depreciation charges that are known for each year and represent one tenth of the initial investment expense). All these factors are exogenous to the company and can be clearly modelled as random variables with certain probability distribution.

The budgeted (and expected) values of the 5 risk factors considered by the company are reported in Table 1. With these values of risk factors, the project generates annual pre-tax profit

$$1\,000\,000 \times 0.10 \times (375\,000 - 350\,000) - 3\,000\,000 - 1\,500\,000 = \text{¥}3\,000\,000\,000,$$

and annual cash-flow in the amount

$$3\,000\,000 \times 0.50 + 1\,500\,000 = \text{¥}3\,000\,000\,000,$$

which implies the following calculation of NPV

net present value = -15 000 000 000 +

$$+ \sum_{t=1}^{t=10} \frac{3\,000\,000\,000}{1.10^t} \doteq \text{¥}3\,433\,701\,000.$$

Table 1. Budgeted (and expected) values of risk factors for each year of the project duration

Risk factor	Expected value
Market size (number of electric scooters)	1 000 000
Market share	0.10
Unit selling price of an electric scooter	¥ 375 000
Unit variable costs	¥ 300 000
Fixed cost (non inclusive depreciation)	¥ 3 000 000 000

Source: the authors.

In addition to the budgeted estimates, the original authors of this case study take into account various scenarios for the evolution of risk factors such as the optimistic model or the pessimistic variant, see Brealey et al. (2008, p. 273) and their basis evaluate credibility of the calculated NPV ¥ 3.433 mds. This approach of subjective stress testing is characteristic of certain drawbacks and 3 crucial objection can be raised thereto (cf Bođ'a and Gavliak, 2007, p. 30): (1.) Scenarios are chosen on a subjective liking and their usability heavily depends on the experience of the user. (2.) It is not possible meaningfully assess individual variants of the future radical development, in which consequence it is of question which of the scenarios is more probable and

should be considered in preference. (3:) Frequently it is beyond possibilities to evaluate the completeness or likelihood of produced information in a probabilistic or statistical sense.

Brealey et al. (2008, pp. 278-282) contemplate using Monte Carlo simulations in the description of basic risk properties of the project. Thereon they assume the Gaussian distribution for each risk factor under consideration and they rely on independence of risk factors, which facilitates the construction of the probability distribution of project cash-flows on the basis of 10 000 simulations. They only outline that for each simulated scenario a new figure of NPV should be calculated and the final results should be evaluated.

The paper offers, in the scope of the stated case study on electric scooters and their production, a more complex view on assessing risk of investment projects. The approach indicated by the originators of the case study may be extended by considering more suitable and more typical probability distributions for the identified risk factors, by allowing a higher number of simulations in order to enhance precision of results and by producing a detailed analysis of simulation results. Besides visual and descriptive statistical processing of simulated project NPVs, additional information should be uncovered and identified as to

- under which value the true NPV of the project should not fall at a pre-specified and sufficiently high confidence level (such as 0.95),
- with what probability the project achieves a negative NPV,
- with what probability the true NPV of the project is lower than the budgeted NPV, and
- what relationship exists between risk and return of the project.

4 Simulation setting and interpretation of results

There are only four risk factors under advisement in the contribution, viz. the market size, the market share, the unit selling price and the unit fixed cost. The fixed cost are assumed to be under control of the company (for example because they are contracted beforehand) and shall be in the anticipated amount of ¥ 3 mds. (without depreciation) and ¥ 4.5 mds. with depreciation charges. The combination of these four risk factors determines the amount of cash-flow of the project in Year 1 and it is assumed that cash-flows in the following nine years are not constant but change with respect to the amount of cash-flows in the previous year. In Year 1, the cash-flow of the project is represented by the equation

$$Z = \eta \times \xi \times (\psi - \zeta) - 4\,500\,000\,000 \quad (4)$$

$$Y_1 = Z \times 0.50 + 1\,500\,000\,000$$

in which all variables relate to Year 1: Y_1 is cash-flow in ¥, η stands for the market size (expressed as the number of scooters sold), ξ represents the market share (expressed as percentage), ψ denotes the selling price of scooters in ¥, and, finally, ζ represents unit variable cost in ¥. Variables η , ξ , ψ and ζ are random variates, in which consequence Y_1 is of a stochastic nature as well. The assumed probability distribution of these variables is displayed in Table 2. The selling price of electric scooters and the unit variable cost are modelled in such a way that their amount does not drop beneath a certain level (i.e. situations when the selling price would go under ¥ 250 000 or the unit variable cost would recede under ¥ 200 000 are excluded from possibilities). For the sake of simplicity, the random variates η , ξ , ψ and ζ are treated as independent. It is evident that this assumption is not justified for some pairs of these random variates (e.g. the market size and the market price) or otherwise oversimplifying (such as the market size and the selling price of electric scooters).

Another assumption is that cash-flows in Years 2 – 10 evolve according to an AR(1) process, whilst their expected value is Y_1 (or rather the realized value of Y_1) and the correlation coefficient between cash-flows of two successive years is 0.90. The AR(1) model with Gaussian innovations that is in compliance with

these requirements is specified by the equation holding for $t \in \{2, \dots, 10\}$

$$Y_t = 0.10 \times Y_1 + 0.90 \times Y_{t-1} + \varepsilon_t \quad (5)$$

wherein Y_t denotes the amount of cash-flows in Year t and ε_t is a Gaussian white noise for Year t with zero mean and dispersion

100 000 000². The parameters of equation (5) warrants that the expected value of cash-flows in Years 2 – 10 is Y_1 (or rather the realized value of Y_1) and the correlation coefficient between cash-flows between two consecutive years is exactly 0.90.

Table 2. Risk factors of the project and their probability distribution

Risk factor	Distribution	Expected value
Market size (the number of electric scooters)	Normal(1 000 000, 50 000 ²)	1 000 000
Market share	beta(25, 225)	0.10
Selling price of electric scooters	250 000 + LogNormal(11.73107, 0.10 ²)	¥ 375 000
Unit variable cost	200 000 + LogNormal(11.50688, 0.11 ²)	¥ 300 000
Fixed cost (without depreciation)	constant	¥ 3 000 000 000

Source: the authors.

For each simulation, NPV is a function of 13 random variates $\eta, \zeta, \psi, \zeta, \varepsilon_2, \dots, \varepsilon_{10}$, or of their realizations, and the following formula applies

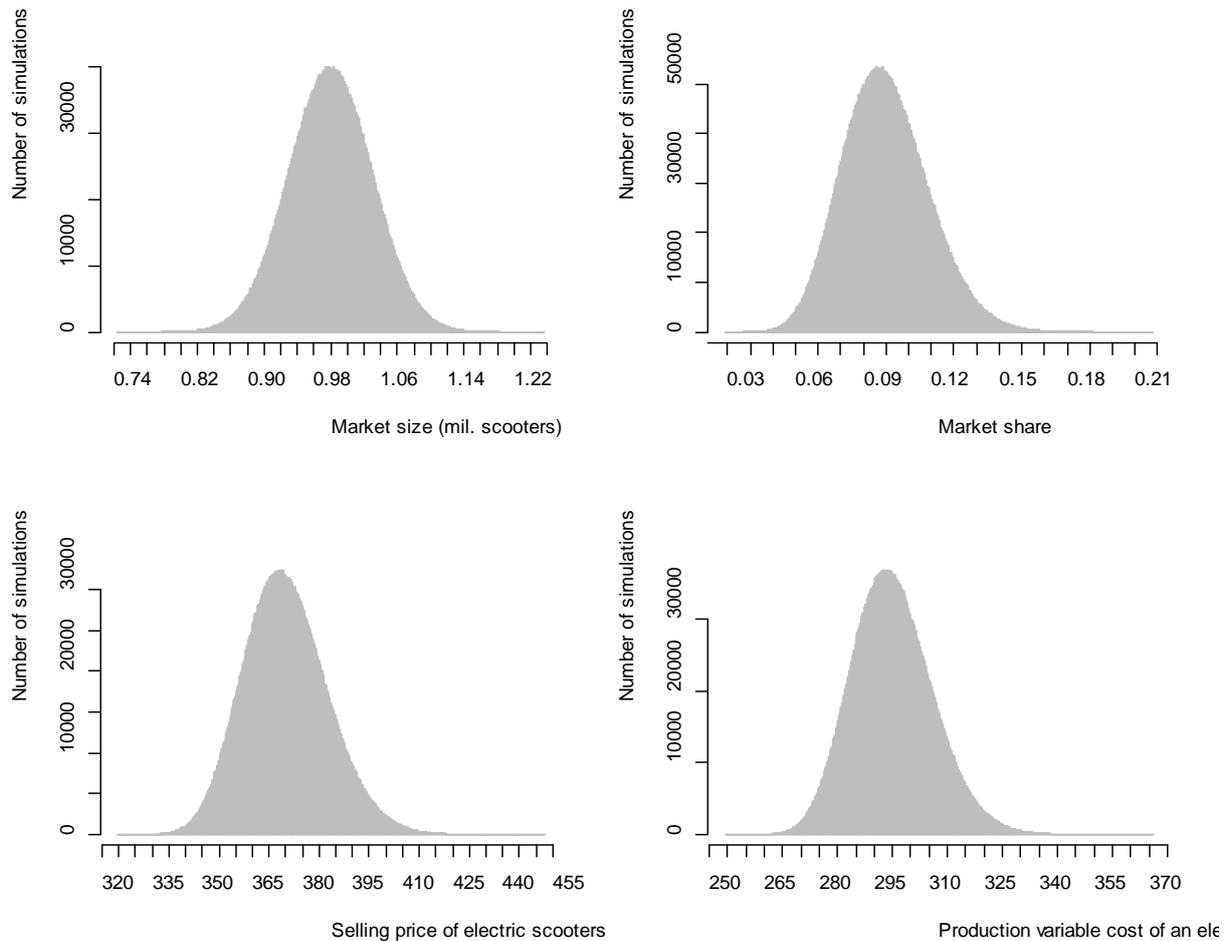
$$NPV(\eta, \zeta, \psi, \zeta, \varepsilon_2, \dots, \varepsilon_{10}) = -15\,000\,000\,000 + \sum_{t=1}^{t=10} \frac{Y_t}{1.10^t} \quad (6)$$

On the basis of the accomplished mapping of risk factors into the criterion of NPV were under the setting of Table 2 run a total of 5 000 000 Monte Carlo simulations of the variates η, ζ, ψ a ζ in relationship (4) and then produced 5 000 000 Monte Carlo simulation of the future cash-flow development under relationship (5). These scenarios enabled a construction of the

empirical distribution of NPV. The number of simulations was derived from the fact that in simplest designs one risk factor requires running 10 000 simulations. Here a higher count of simulations corresponds with the higher number of risk factors. Simulations were run and graphical presentations prepared in program R, version 3.0.1 (R Core Team, 2013). Therein, three specialized libraries of program R were employed, MASS (Ripley, Venables et al., 2013), tseries (Trapletti and Hornik, 2013), PerformanceAnalytics (Carl et al., 2013).

Figure 1 displays the histogram-like shapes of simulated values of the risk factors η, ζ, ψ a ζ .

Figure 1. Empirical distribution of simulated risk factors

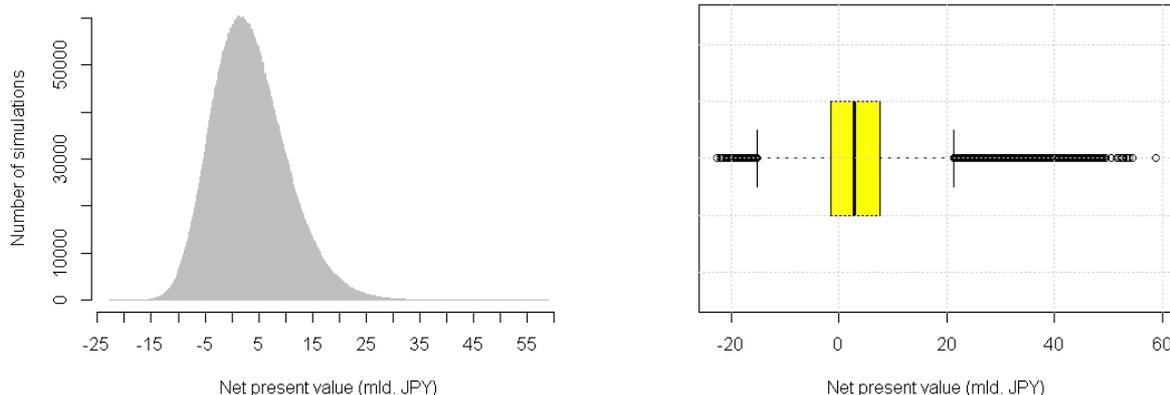


Source: the authors.

Figure 2 shows the final histogram of the NPV of the project as well as the box-plot of simulated values.

As evident from the histogram and the box-plot of simulated values of NPV, the distribution of NPV has a longer right tail and the mass of the distribution is concentrated to the left, which implies that NPV tends to realize values under the expected mean value. In addition, the distribution of NPV is prone to unsatisfactory negative values and leptokurtosis is manifest

Figure. 2. Empirical distribution and box-plot of NPV



Source: the authors.

Basic descriptive characteristics of the simulated distribution of NPV confirm the declared properties formulated on the basis of visual inspection and graphical analysis. They are summarized in Table 3.

Table 3. Elementary empirical characteristics of the distribution of NPV

Descriptive	Value
Minimum	¥ -22.438 mds.
Lower quartile	¥ -14.782 mds.
Median	¥ 2.812 mds.
Upper quartile	¥ 7.667 mds.
Maximum	¥ 58.184 mds.
Average	¥ 3.434 mds.
Standard deviation	¥ 6.946 mds.
Coefficient of variation	2.023
Moment skewness	0.551
Moment kurtosis (symmetrized about 0)	0.565

Source: the authors.

The mean NPV is ¥ 3.434 mds. and is in consistency with the expectations on the value of risk factors as systemized in Table 1 and Table 2. The risk of the project can be measured and assessed in several ways.

1. The standard deviation ¥ 6.946 mds. in relation to the expected NPV ¥ 3.434 mds. (representing 202.30 %) indicates high dispersion of true (or rather simulated) values about the (computed) expected value, and in effect is also indicative of high risk as well. Measuring risk by means of the standard deviation nowadays represents a classic approach.
2. A more modern approach rests in measuring risk by "at risk" measures, i.e. downside risk measures, which communicate the worst value of the target criterion over a given time horizon and at a certain confidence level. If the probability distribution of the target criterion is known, the "at risk" measure is expressed as a lower quantile (usually 0.01-quantile or 0.05 quantile) of the distribution in question. It is possible to compute 0.05-quantile out of

(owing to the occurrence of outlying and extreme values). In spite of (optically) slight left-tailedness NPV takes preferably high extreme positive values than extreme negative values. The distribution of the NPV of the project is with respect to its asymmetry and leptokurtosis does not reveal compliance with the Gaussian distribution, which is supported by the Jarque-Bera test as well (the Jarque-Bera statistic is 319418.9, the associated p-value is zero).

3. Another possibility of constructing "at risk" measures stems from expressing them as an absolute or relative deviation from the expected (or budgeted) level of the target criterion. The value of NPV at risk expressed as an absolute (or relative) deviation captures a maximum negative absolute (or relative) deviation of NPV from the expected amount at a specified confidence level. For the project under assessment, it holds that with confidence 0.95 its NPV will not deviate from the expected value ¥ 3.434 mds. upwards more than $3.434 - (-6.810) = ¥ 10.244$ mds., or – put in relative terms – $10.244 / 3.433 = 298.29$ %. Both these variants of „at risk“ measures highlight high riskiness of the assessed project.
4. Of heavy importance is the probability with which the project will attain a negative NPV. This figure can easily be estimated as a proportion of negative simulated NPVs to the number of all simulations, which is 33.25 %. In a similar fashion, it is possible to estimate the probability that the NPV of the project will end beneath the expected level. For this project this probability is estimated at 53.63 %. These values are again indicative that this project is highly risky.
5. By comparing risk and return associated with the project, it is possible to estimate acceptability of the project in regard to its risk, or rather to evaluate capability of the project to generate return at a reasonable degree of risk. This may be measured as a proportion of the expected NPV to the standard deviation of NPV. This indicator is useful in comparing favourableness of various projects. For the project in question, a unit of risk (measured by standard deviation) yields expectably $3.434 / 6.946 = 0.49$ units of return (in the form of NPV). The relationship between risk and return for this investment project is unbearable and testifies of extreme and inappropriate burdening of the project by risk.

As follows from the aforementioned facts, this project is not recommendable for implementation given the circumstances considered.

5 Conclusion

The paper indicates a possibility of applying the conceptually simple and illustrative simulation method Monte Carlo in investment decisions and project evaluations, which makes it possible to obtain, in a relatively easy way, the probability distribution of NPV and accordingly to determine suitable indicators as inputs to deciding on implementing or discarding the project. A simple case study in the paper demonstrated that this method can be employed so as to obtain answers to questions such as:

1. What is the worst NPV that can be expected for the project at a certain confidence level (usually 0.95 or 0.99)?
2. What is the probability that the project attains a negative NPV?
3. What is the probability that the NPV of the project is lower than the expected (budgeted) target value?
4. What is the relationship between risk and return for the project?

In spite of unquestionable advantages of this method and despite the fact that Monte Carlo simulations are a very useful tool in deciding on investment projects and in their evaluating, it is needful to recognize that in its final effect it is still a "laboratory" model. No model is capable to map and describe all uncertainties and dependencies, to which a project is subjected. Results obtained through modelling (or Monte Carlo simulations) can only be used as a supportive tool in decision-making and no way can they be globalized or overtopped above results gained through other methods.

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Primary Paper Section: A

Secondary Paper Section: none

POSTMODERN VIEW OF THE NATURE OF THE INTERNET AS A SOURCE OF INFORMATION

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Abstract: Above all, the Internet is perceived as a consequence of information tools development. Its image, however, is also a result of socio-economic changes that are of greatest importance when it comes to behaviour represented by the Web users. This wide context of analysis makes the nature of the Internet complex and characteristic for postmodern description of reality. The objective of this article is to present the contemporary nature of this medium and to define behavioral tendencies of its users. The attempt that has been made to describe all the problems mentioned appears to be valuable also from the point of view of entrepreneurs, both in the context of the way of running business and understanding the conduct of other market participants.

Keywords: postmodernism, Internet, information.

1 Introduction

The notion of postmodernism is present both in social sciences and in the humanities, for example in art. In case of the latter one experts often use such terms as "decentration" or "antistructure" while referring to the construction of a piece of art which is an example of this trend. However, as it is often pointed out, none of these possibly used terms fully reflects the essence of the discussed issue [Zalewski 1998].

On management science ground A.K. Koźmiński speaks clearly about the range of problems connected with postmodernism in social sciences by stating that the lack of "clearly marked up ways to distinctly defined targets, obvious rules and great, monolithic structures, in which everyone may and should find a place for themselves" is characteristic for postmodernism [Koźmiński (Foreword); Kostera 1996].

The notion "nature" used in the title of the article becomes the key element for the postmodern perspective of the described problem. Encyclopaedic explanation of this notion states first of all that it is "a kind, an essence of a given object or phenomenon, being the principle of its activity", and secondly, it is "objective and tangible reality" [*Podręczna encyklopedia PWN* 2002]. On the one hand, as it will be outlined in the article, this very nature of the Internet is a consequence of complexity of contemporary reality. Therefore, it is impossible to explain lucidly this fundamental principle which shapes its face. On the other hand, the Internet is commonly referred to as virtual reality, thus at first it seems paradoxical to accept this explanation. Obviously, the problem here is the understanding of the notion "virtual" which contrary to general understanding does not mean anything "unreal", but rather elusive, generating however most perceptible results of its own influence. As a consequence, it leads to the problem presented in the first place: how to describe the cause when it is ephemeral, and in this connection the relation between the cause and effect is vague [Taboli, Pourkiani, Ahmadzadeh 2013].

Previous issues become fundamental for the attempt made in this paper to describe the Internet as a consequence of specific conditionings of contemporaneity which together constitute the notion of postmodernism that may be considered by adopting characteristic reference points/ areas of interests. It is worth highlighting that in connection with the above mentioned this very attempt to define the Internet as well as to treat it as a source of information will take specific composition of description of the so called Web (i.e. the Internet – note). It is worth highlighting that in case of the Internet it is not the architecture of technical infrastructure that becomes the most important aspect for social sciences but the ways in which it is harnessed by users, and as a result the roles users assume in the course of their activity in the Web.

2 Issues of postmodernity

In literature there are several synonymous terms referring to postmodernism. Among them there are for example postindustrialism or postmodernity. This problem arises from various references to the description of reality [Clegg, Kornberger 2003]. There are two main areas distinguished here, these are: ideas, i.e. opinions, attitudes or the so called infrastructure, i.e. people themselves and manifestations of their lifestyle [Morawski 1999]. A distinct issue which complicates this matter is the formation of descriptions independently from one another, out of which not every single one becomes basic for the current standard of reference to reality.

For the purpose of the article the author assumes that the notion of postmodernity is synonymous to postmodernism. The notion of postindustrialism, however, is a specific view of postmodernism and it reflects the first perspective presented in table 1. The table contains questions that may possibly be asked in order to define the gist of postmodernity. At the same time, it becomes clear that in fact there are many possible perspectives in its description. It is also worth noticing that since they present the same reality from different points of view they are to some extent convergent.

The existence of many perspectives of reference to the problem of postmodernity itself may prove its potential attributes. They seem to be of basic importance for cognitive processes. Firstly, it may be assumed that there is not a single one commonly binding narration of description of reality, in this connection methods of description vary. It also leads to the conclusion that description of local conditionings and individual cases becomes equally or even more important than recognizing currently binding tendencies. Secondly, postmodernity rejects the possibility of impartial observation of the researched reality, assuming that each observer constitutes its part and therefore cannot provide an objective description. Thirdly, attention is paid to processes, flexibility, "the becoming", and not to static relationship of data (the aim is to recognize why something becomes important, and not to what extent it is important). Fourthly, the individual perspective, individual understanding of the world, individual paths of solving problems become outlined [McBride, Lander, McRobb 2011].

Considering the content of table 1 it may be concluded that perceiving knowledge or information as widespread resources is characteristic for postmodernism. They are available via all kinds of electronic media or in the form of qualified employees' feature. It is worth highlighting that knowledge therefore has rather become a commodity and lost its importance as a source of self-fulfillment. Simultaneously, internationalization as well as globalization of all socio-economic aspects of life give an impulse for further acceleration of knowledge popularization. However, the existence of many perspectives of reference to reality causes that the popularized knowledge is unlimited in interpretation [Marinescu, Constantin 2009] – this is where the postmodern attributes come from.

The aspects of the essence of postmodernism are also reflected in economics and management. Searching for sources of postmodernity in this scientific area, one may quote, following M. Kostera, trends which were the basis of contemporary descriptions of economic phenomena [Kostera 1996]: change of ownership structure (above all progressive separation of ownership from direct running of business); formation of social corporate responsibility (aims of various stakeholder groups of enterprises become important); necessity to redefine efficiency measurement of enterprise functioning (categories that are not classified as financial profit ones are also included here); significant share of services in national income (decreasing share of industry; increase in importance of services connected with information processing); active and strategic role of state on the market; globalization.

Tab.1. Understanding the essence of postmodernism

Perspective	Description
What constitutes the basic good?	Information as a basic good; rapid technological development and its connection with current trends [Hatch, Cunliffe 2013]; emergence of sign-goods (decisions concerning purchase of a product do not depend on assessment of its functionality [Chien-Hsiung 2010]).
How is reality experienced?	Lack of constant values; temporary moment attitude; writing being forced out by multimedia communication; blending of positive experiences of fast and intensive life with constant fear [Bauman 2000].
Where does the social burden lie?	Shifting the social burden from employees hired in production plants onto intermediaries-managers; forming of communities based on temporary idols, common actions, succumbing to pressure of opinion [Clegg 1990].
What is the key form of capital?	Key role in contemporary banking and finance corporation economy; market globalization, constant flexibility in the choice of investment areas [Burbach 2001].
What is the nature of contemporary societies?	Consumption as a life motto ("consumption for the sake of consumption"); consumption as a constantly repeated ritual [Willmott 1992].

Source: study based on S. Morawski, *Niewdzięczne rysowanie mapy... O postmodernie(izmie) i kryzysie kultury*, Wydawnictwo Uniwersytetu Mikołaja Kopernika w Toruniu, Toruń 1999

Tendencies in economic development mentioned above, which have been present for many years, indicate the importance of changing roles performed by particular subjects/representatives of society, as well as objectives they want to reach. On the one hand, these objectives are common in certain areas, whereas in others they differ. Moreover, noticing this conformity or antagonism may depend on the arrangement of subjects in question. Therefore practically, while making the attempt to reconcile them, cooperation between various subjects takes place and in this way the Web structures appear [Gill 1996]. They are an expression of description of postmodernism in management presented by A.K. Koźmiński. There are no monolithic structures in which subjects are supposed to find their own place. They strive after finding a place that suits them and guarantees realisation of their objectives. What is more, the defined goals as well as relations between subjects may undergo conversion and consequently the content of subjective cooperation system itself may change, too. It is characteristic for the concept of reality in which certain groups emerge with regard to, among others, convergence of motivation at a given time.

This potential configuration of system of subjects seems even easier and more obvious if progressive informatization and virtualization of activity are to be distinguished in trends that shape contemporary reality [Żukowska 2009]. It is also worth highlighting that constant information and knowledge exchange takes place among members of social groups and economic subjects parallel to the trends characteristic for postmodernity.

It is worth emphasizing that specific attitude towards the issue of space-time in analysing reality is typical for postmodernism. It may be stated that the adopted configuration of the notion of time and space becomes significant (also in the economic aspect of postmodernity). Space itself becomes capacious in terms of the scope of notion, whereas time category is connected with aiming at establishing why a particular phenomenon becomes important- for this reason postmodernity banks on the analysis of the course of the past, presence and future [Rahman, Hussain 2011].

3 Manifestations of postmodernity on the Internet

The Internet may be presented as space defined by architecture of interactions undertaken by the Web users in the communication process. However, the users very often define themselves while making and maintaining relations, which is characteristic for postmodernistic conditionings. It results in the possibility of becoming whoever they want to become on the Internet and to harness informatics infrastructure in a way that suits them with the aid of certain communication tools that it offers [Markham 2004].

Therefore there is no possibility to directly and precisely explain motivation and methods of activity of users on the Internet. It may be attempted by analysing course of actions of a given virtual community as well as characteristics of the Web place/space in which they are active. There is also another reason for the significance of this problem, which is so characteristic for postmodernism,. As it has been emphasized, users' activity consists in communicating and exchanging information in various forms. Information often becomes the basis of knowledge regarding a particular problem discussed in the virtual reality. It seems that it does not matter whether information is published by individual Internet users (private person) or sole proprietors running their business on a given website (institutionalized kind of virtual community members). Private opinions and judgements become egalitarian in reference to facts made known by information portals or they are the basis of the functioning of services. Moreover, it may be observed that there is a connection between content presented by Internet users and electronical media. For the media it is common that comments of Internet users are equal to facts presented in services or that special services presenting comments of virtual community emerge (e.g. *Publiczna.tv* programme on Polish TV channel TVN24; or publishing the so called readers' letters in official local information services *Gazeta.pl*; it is also characteristic to show entries on blogs made by politicians or publicists as information, which are nothing but their personal views). These opinions of readers/viewers/Internet users/media experts become also the basis of taking up by them particular plots in their journalistic work.

It is worth highlighting here that the Internet is strongly integrated with other kinds of media. Each information television in Poland has its own portal which complements and supports the TV programme. Similar situation concerns many headlines in the press. What is more, one may observe the increasing role of the portal in comparison to TV channel/newspaper. It is also worth noticing that Internet users have, owing to mobile telephony, mobile access to the Web and they may modify its information resources from anywhere.

Disorientation as an element which is surprising and incoherent with the reference context is also characteristic for the Internet [Zalewski 1998]. It results both from the users' activity and sole proprietors running their official business activity in the Web. On the part of these disorientation consists above all in drawing Internet users' attention by using "catchwords" that while analyzing the content that is hidden behind them turn out to be false. Making articles or press notes headlines more attractive by formulating radical and scandalizing statements in order to draw the attention of Web users is a typical and notorious practice. After having become familiar with the content hidden by a given headline it often turns out that it is completely disconnected from the context and the sense of the text is totally different. On the other hand, Internet users themselves can create references to particular matters/facts that are incomprehensible and unexpected by other users, for example on portals edited by virtual community (e.g. Wikipedia).

Disorientation on the Internet may also refer to the architecture of relation of information constituting its resources. It is possible that particular link hides content or website that is different from the one it suggests. There is also a problem with the form of advertisements and other contents presented on the website

parallel to information desired by the Internet user which may influence the scope and level of information absorption.

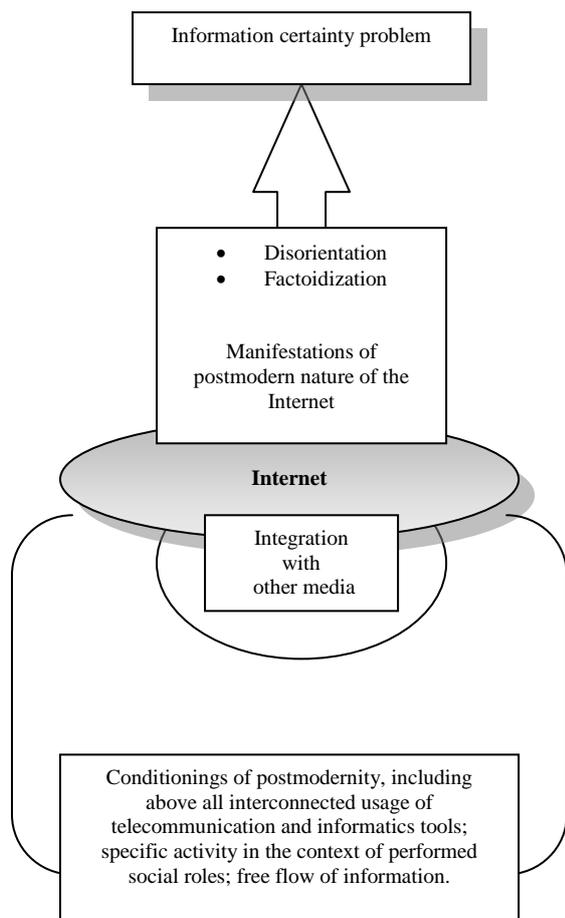


Figure 1. Conditionings of postmodernism and the Internet as a source of information.

Source: own study.

The appearance of factoids is a consequence of disorientation and lack of possibility to recognize motives which are followed by users undertaking their activities (including institutionalized Web participants). This notion stands for "lie or half-truth accepted as truth due to the very fact of its emergence" [dictionary of the Polish language: sjp.pwn.pl 2013]. This emergence is connected with publishing information on the Internet and/or in other media [Charmaz 2009]. Popularization of this kind of information leads to the situation in which facts that never took place are treated as true ones, but also in consequence and which is not often taken into consideration, real facts (though rather unlikely) e.g. due to lack of wide popularization may be regarded as false. The problem is even more serious since, as it has been already stated, the Internet is integrated with other media and the common popularization may take place, and as with this connection authentication of information may occur. Therefore postmodern reality requires searching for confirmation of the published information, and the level of its certainty appears to depend not only on assessment of its likelihood but also on assessment of reliability of its sources. The assessment is in turn the result of subjective process of their evaluation which is done by the Internet users.

4 Summary

The Internet has already become an important area of interests in the middle of the 1990's. At that time, that is at the dawn of commercial usage of the Internet, many analysts announced the emergence of medium which guaranteed market participants the

access to perfect information. However, soon after that it was estimated that a great part of information resources of the Web is not true.

Nowadays, it seems impossible to evaluate the truthfulness of all information resources on the Internet since their interpretative context appears to be too complex. Apart from that, there is ever greater belief among the Web users that information which does not appear in the Web resources cannot be true.

Development of information technology as well as changes in behaviour of the society became the basis of postmodern nature of the Internet. At the same time, it is worth noticing that mutually conditioned transformation of relations on the ground of technical studies and society (tools used in the context – social activity) exemplify relatively fully the Internet as a source of information only when they are analyzed at least in the context of the past and the presence.

Postmodernity as a view of nature of the Internet leads then to two basic aspects that shape contemporary attitudes of the Internet users. Firstly, they often treat the Web as a main dimension of reality and therefore as a main source of information. Secondly, users of the Internet should browse through information resources in order to confirm them by confronting various sources and to catch unreflective copying of content in various places in the Web. These attitudes (or lack of them) seem to have basic influence on socio-economic activity that is actually conducted by the Internet users.

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Primary Paper Section: A

Secondary Paper Section: AE, AH

THE RELATIONSHIP BETWEEN MORAL JUDGMENT COMPETENCE AND EMPATHY: A COMPARISON OF THREE AGE GROUPS

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This study was supported by an internal grant from the Faculty of Arts and Letters at the Catholic University of Ružomberok in Slovakia.

Abstract: This study investigated relationships between emphatic skills and moral judgment competence among 180 adolescents, 170 early adults, and 150 adults (N = 500). Participants completed a battery of measures including the Basic Empathy Scale, the Moral Judgment Test, and the Demographic questionnaire. Results of this cross-sectional study have confirmed the expected findings. Adolescents' and early adults' moral judgment competence was positively correlated with cognitive, and affective empathy. Results from an adult sample showed positive relation between moral judgment competence and cognitive empathy and negative relation between moral judgment competence and affective empathy. In conclusion, implications for moral education are discussed.

Keywords: moral judgment competence, cognitive empathy, affective empathy, adolescent, adult

1 Introduction

Moral judgment competence and emphatic skills are among essential the social competences that have roles in the evolution and social development of human beings. Development of the competence of moral judgment and empathy in an individual is substantial for the development and democratization of societies. Morality requires that the actions of an individual are "rational, motivated by purpose or intent, and carried out with autonomous free will" (Arnold, 2000, p. 367).

In the 1970s, Lind developed a new concept and evaluation of morality, centring on moral judgment competence (Lind, 2008a). Based on Kohlberg's (1964; 1984) definition of moral judgment competence, Lind created the dual-aspect theory of moral development. Kohlberg (1964) defined moral judgment competence as "the capacity to make decisions and judgments which are moral (i.e., based on internal principles) and to act in accordance with such judgments" (p. 425). Lind's dual-aspect theory made it clear that the moral person must not only realize what is moral, he or she must also have the capacity to actually act upon it. Moral judgment competence also specifies morality in the context of a person's intrinsic feelings of what is allowable, not only the understanding of social norms and values. Accordingly, the concept of moral judgment competence establishes together the affective, cognitive, and behavioral aspects of morality into one component to be measured as a whole.

It has been proposed (Stotland, 1969) that all moral or altruistic behavior is based on empathy. There were many debates about the definition of empathy. Empathy can be seen as one of the basic human characteristics, and the ability to feel empathy for fellow human beings is an important aspect of positive social exchanges (Mehrabian & O'Reilly, 1980). The term empathy has been defined in several ways. One definition highlights the cognitive component of empathy, because it views empathy as the willingness and ability to put oneself in another's place (role-taking) (e.g., Hogan, 1969). Other researchers have used a definition of empathy stressing its emotional aspects (e.g., Stotland, 1969; Mehrabian & Epstein, 1972; Hoffman, 1977). They defined empathy as a vicarious emotional response to the perceived emotional experience of others. In the past there was a trend to describe empathy as only cognitive or only affective process, but at present it is revealed that empathy is a multidimensional construct involving both cognitive and affective dimensions (Boston, 2007; Hoffman, 2000). Empathy as one of the significant prosocial behaviors (Batson & Shaw, 1991) is among the fundamental moral emotions in addition to the feelings of guilt and embarrassment (Behrmann, 2001). Persons with high moral

judgment and emphatic competences choose democratic ways to violence for dealing with problems (Lind, 1993; 2000; 2003). They are also able to set up interpersonal relationships (Tangney, 1991; Hoffman, 1994; Lind, 2003).

1.1 Is empathy necessary for morality?

Empathy and moral judgment competence have been studied extensively as separate topics, but little research has considered the association between the two concepts. Researchers and theorists generally agree on the positive role empathy plays in moral development. Hoffman (1987) detected that it is important for a complete moral theory to involve empathy. He argued that empathy contributes to the development moral reasoning because it stimulates internalized moral judgments reflecting concern for others' welfare. The author also accented the significance of feeling, empathy, socialization and situational cues in selecting moral principles.

For most of moral development theorists, internalizing moral values and moral principles require perspective-taking skill, which is also outlined as emphatic reaction. This ability is necessary for an individual to focus on others' needs in place of one's own (Eisenberg, 1987, 2000; Gibbs, 2003; Hoffman, 1976; 2000; Pizarro, 2000; Pizarro & Bloom, 2003).

Theoretical research points to a possible positive correlation between empathy and moral judgment competence. Eisenberg (2000), Pizarro (2000), Hoffman (2000) and Walker (2002) detected the role of empathy as catalyst for moral judgment. In addition, empathy has been linked to relatively high levels of moral reasoning and social competence, and to low levels of aggression and antisocial behavior (Eisenberg, 2007; Carlo, 2013).

Similar relations between empathy and moral reasoning have been found in other samples of adolescents in the United States (e.g., Carlo, Eisenberg, & Knight, 1992; Eisenberg-Berg & Mussen, 1978) and Brazil (e.g., Eisenberg, Zhou, & Koller, 2001). In various studies by researchers in various countries, emphatic impact on moral development in adolescents and adults were analyzed, and it was exposed that empathy has positive effects on moral development (Miller, Eisenberg, Fabes, & Shell, 1996; Upright, 2002; Verducci, 2000). Researchers Shelton and McAdams (1990) encourage using empathy to create effective programs that promote prosocial behavior. In their Visions of Morality Scale (VMS) they include empathy as one of the dimensions that are necessary for everyday morality.

The results of the study of Berenguer (2010) indicate that participants who showed a high empathy level provided more arguments of moral reasoning than those in the low empathy group.

A lot of psychologists and therapists have accented on the significance of moral reasoning and empathy competence while defining the mental and psychological health of individual (Adler, 1969; Fromm, 1947; Horney, 1945; Kalliopuska, 1983; Preston & Waal, 2002).

The main purpose of this study was to look at the empathy-morality relation in three age groups. The aim of this study is to analyze whether there is a significant relationship between moral judgment competence and emphatic skills among adolescents, early adults, and adults. Finally, the present study sought to address two primary questions around empathy and moral judgment competence. Is there any difference among different age groups with respects to their relationship between moral judgment competence and cognitive empathy? Is there any difference among different age groups with respects to their relationship between moral judgment competence and affective empathy? Finally, the aim of the present study is outlined and hypotheses regarding the relation between the empathy

dimensions and moral judgment competence. Based on the review of literature and on knowledge of the past research conducted on empathy and moral judgment competence as well as a broad understanding of human development, we formulated several hypotheses. First, we hypothesized that the empathy would be positively associated with the moral judgment competence. Second, we expected that differences would arise around the relationship between these two variables with respect to three age groups.

Although the main aim of this study was to look at the empathy–morality relation, we also looked at how age related to moral competence. Research has shown that level of education is a more important determinant of moral competence than age, and that education can stimulate moral competence (Lind, 1993, 2003; Oser, 1986; Rest, 1986). In line with previous research, we expected moral competence to be unrelated to age.

To rule out the possibility that the relationships between moral judgment competence and the empathy dimensions can be reduced to age differences, we checked whether these relations between moral judgment competence and the empathy dimensions remain intact after taking age differences into account. In addition, to rule out the possibility that the relations between moral judgment competence and the empathy dimensions vary by level of age, we tested the moderating role of age.

A cross-sectional study was used to investigate the moral judgment competence and empathy of three age groups.

2 Method

2.1 Participants

Participants in this study included 180 adolescents (Mean age = 16.0; SD = 1.7), 170 early adults (Mean age = 22.0; SD = 2.0), and 150 adults (Mean age = 35.0; SD = 2.3) (N = 500).

Adolescent sample

At the beginning of the September of 2012 teachers of secondary schools were asked to distribute two questionnaires to their students. The sample consisted of total 180 students from various public schools located in the Zilina region of the Slovakia. Out of these students were 46% males and 54% were females. The participants' ages ranged from 15 to 17 years with an average age of 16.0 (SD = 1.7).

Early adult sample

At the beginning of the winter term of 2012 and 2013 undergraduate students were invited to take part in a survey on empathy and morality. Survey participation was voluntary, but students were promised one extra credit point (above the maximum of 100 total points) for taking part in the anonymous survey. A total of 170 early adults participated in the survey. They were asked to give responses according to the instructions provided in the questionnaires. The students were registered in the following majors (fields of study): psychology, social work, educational science, philosophy, religion, and health science. Approximately half (47%) of the students were males, 53% were females. The participants' ages ranged from 21 to 23 years with an average age of 22.0 (SD = 2.0).

Adult sample

The adult sample came from a stratified sample based on gender, and age. Psychology students of the Catholic University in Ruzomberok were asked to distribute two questionnaires to adults in the age range of 30 to 40. There were 55% females and 45% males. Their average age was 35.0 (SD = 2.3).

2.2 Measures

Demographic questionnaire. The demographic questionnaire was used to gather information about the participants. Each participant was required to complete a self-reporting

questionnaire, which included demographic questions about the participant's age, gender, study specialization.

Empathy. Participants completed the 20-item Basic Empathy Scale (Jolliffe, Farrington, 2006). The original BES is a 20-item scale, self-rating measure with two subscales: cognitive empathy (9 items, e. g., "I find it hard to know when my friends are frightened"; $\alpha = .79$) i. e., the ability to understand another person's experiences; and affective empathy (11 items, e. g., "I do not become sad when I see other people crying"; $\alpha = .85$) i. e., measuring an observer's congruence (emotional) with another person's emotions. Agreement with statements was indicated on a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree. The sum of the cognitive empathy items' ratings was the cognitive factor score (range 9-45), and the sum of the affective empathy items' ratings was the affective factor score (range 11-55); the sum of two factors scores was the total score (range 20-100).

In this study the Cronbach's reliability coefficient for cognitive empathy was $\alpha = .72$ and affective empathy $\alpha = .78$. It demonstrates a high level of internal consistency. It took participants on average 10 minutes to complete the BES.

Moral judgment competence. Participants completed the Moral Judgment Test (Lind, 2008a), which consists of a workers' dilemma and a mercy-killing dilemma. For each dilemma, a person has to identify to what degree he/she agrees with the solving chosen by the actor(s). Next, this person is confronted with six arguments pro and six arguments contra his/her opinion on how to solve the dilemma. The person then designates, on a 9-point scale ranging from -4 to +4, to what degree these arguments are un(acceptable). The MJT provides a good task for observing subjects' moral judgment competence, that is, their ability to judge in accordance to moral principles. The C score indexes this ability. The C score (C-index) can range from zero, indicating absence of any moral judgment competence, to 100, indicating perfect judgment competence. The MJT provides a pure measure of moral judgment competence. A high C score indicates that the subject can rate arguments consistently from a moral point of view. Thus, in general, people obtaining the highest moral competence levels are also the ones preferring the most advanced socio-moral perspectives. These results support Kohlberg's presupposed affective-cognitive parallelism. It took participants on average 20 minutes to complete MJT.

2.3 Statistical analysis

Statistical analysis was performed using Statistical Package for the Social Sciences 17.0 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics (including means, standard deviations) were calculated for characterizing the three age groups. For determining the associations and correlations between empathy and moral judgment competence, the bivariate correlations and regression analyses were used. A p-value < .001 was taken to indicate statistical significance for all comparisons. Internal consistency of the questionnaires was evaluated by computing Cronbach's alpha.

3 Results

Validity analyses

The means and standard deviation of the scores on the MJT and the BES are presented in Table 1.

Tab. 1: Mean and standard deviations of the scores on the MJT and the BES

	Sample 1		Sample 2		Sample 3	
	Adolescents		Early adults		Adults	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
C-index	37.8	6.28	63.2	5.53	47.6	5.34
Cognitive Empathy	30.2	1.99	40.67	3.59	38.7	2.51
Affective Empathy	49.3	1.91	53.62	3.86	50.1	1.69

Table 1 shows that participants in Sample 2 obtained significantly higher scores than participants in Samples 1 and 3 for the C-index. There's a difference in the C-index of participants belonging to the individual groups studied ($F_{(2,498)} = 18,188; p < .001$). Early adults displayed the highest level of moral judgment competence, followed by adult participants and, finally, adolescents.

The results are in line with previous research that has shown that education is the most important determinant of moral judgment competence (the sample 2 is clearly the best educated sub-group). This testifies to the importance of level of education and shows that the results that we obtain with the Moral Judgment Test are in line with earlier results.

Table 1 demonstrates that, compared with adolescents and adults, early adults achieve the highest average score in cognitive and affective empathy. A more detailed statistical analysis, however, has not confirmed the differences between individual groups in either cognitive ($F_{(2,498)} = 23,455, ns.$) or affective ($F_{(2,498)} = 28,345, ns.$) empathy as statistically significant.

Correlation analyses

Among the adolescent sample, the cognitive empathy and affective empathy subscales were positively correlated ($r = .44, p < .001$). The cognitive empathy subscale was also significantly positively correlated with the moral judgment competence (C-index) ($r = .46, p < .001$), and the affective empathy subscale with the moral judgment competence as well ($r = .36, p < .001$). Descriptive statistics and a summary of the adolescent life stage correlational analyses can be found in the Table 2.

Tab. 2: Descriptive statistics and correlational analyses for the adolescent sub-group

	Mean	St. Dev.	Cognitive Empathy	Affective Empathy	C-index
Cognitive Empathy	30.2	1.99	1		
Affective Empathy	49.3	1.91	.44***	1	
C-index	37.8	6.28	.46***	.36***	1

*** $p < .001$, two tailed

Results were essentially the same for the early adult sample. Among this sample, the cognitive empathy scale was positively correlated with the affective empathy scale ($r = .67, p < .001$), and the cognitive empathy scale was also significantly positively correlated with the moral judgment competence (C-index) ($r = .42, p < .001$). The affective empathy scale was similarly positively correlated with the moral judgment competence ($r = .58, p < .001$). Descriptive statistics and the early adulthood correlational analyses can be found in Table 3.

Tab. 3: Descriptive statistics and correlational analyses for the early adult sub-group

	Mean	St. Dev.	Cognitive empathy	Affective empathy	C-index
Cognitive empathy	40.67	3.59	1		
Affective empathy	53.62	3.86	.67***	1	
C-index	63.2	5.53	.42***	.58***	1

*** $p < .001$, two tailed

Interesting differences arose, however, with the adult sample. Within this subgroup, the cognitive empathy scale and affective empathy scale were negatively correlated ($r = -.69, p < .001$). The cognitive empathy scale was positively correlated with the moral judgment competence ($r = .34, p < .001$), and the affective empathy scale was negatively related to the moral judgment competence correlated ($r = -.41, p < .001$). It would appear then, that while the affective empathy during adolescence and early adulthood is predictive of moral judgment competence, doing so during the adult life stage is not.

A summary of the descriptive statistics and correlational analyses for the adult sub-group can be found in Table 4.

Tab. 4: Descriptive statistics and correlational analyses for the adult sub-group

	Mean	St. Dev.	Cognitive empathy	Affective empathy	C-index
Cognitive empathy	38.7	2.51	1		
Affective empathy	50.1	1.69	-.69***	1	
C-index	47.6	5.34	.34***	-.41***	1

*** $p < .001$, two tailed

Regression analyses

In order to determine (a) whether the relations between both empathy dimensions and moral judgment competence remain significant after controlling for the effect of level of age, and (b) whether level of age moderates these relations, a hierarchical regression analysis was performed. In this analysis, moral competence served as the dependent variable and was predicted by level of age in Step 1, the two empathy dimensions in Step 2, and the two interaction components (level of age by cognitive empathy and level of age by affective empathy) in Step 3. Results show that, after controlling for the effect of level of age ($\beta = .18, p < .01$), cognitive empathy ($\beta = .23, p < .001$), affective empathy ($\beta = .34, p < .001$), and the two interaction components ($\beta = .31, p < .001$ and $\beta = .27, p < .001$) explained additional variance in moral judgment competence score. The cognitive and affective empathy and the two interaction components as well significantly added to the prediction of moral judgment competence.

4 Discussions

The main aim of the presented study was to analyze the relationship between empathy and moral competence in three different age groups.

The partial results show that participants in Sample 2 (early adults) obtained significantly higher scores than participants in Samples 1 (adolescents) and 3 (adults) for the C-index. A more detailed statistical analysis confirmed the existence of differences in the C-index of respondents from the individual groups, with these differences being statistically significant ($F_{(2,498)} = 18,188; p < .001$). Level of moral judgment competence was highest in early adults, then adult participants, who were followed by adolescents.

The results are in line with previous research (Lind, 2000; 2003; Schillinger, 2006) that has shown that education is the most important determinant of moral judgment competence (the sample 2 is clearly the best educated sub-group).

The levels of empathy within the individual groups were also subjected to analysis. However, no statistically significant differences in cognitive and affective empathy among the studied groups have been detected.

Our findings supported the conclusions drawn by previous research (Hoffman, 1976; Eisenberg-Berg & Mussen, 1978; Kalliopuska, 1983; Eisenberg, Miller, Shell, McNalley, & Shea, 1991; Eisenberg, Carlo, Murphy, & Van Court, 1995; Pizarro, 2000; Eisenberg, 2000; Eisenberg et al., 2002; Haidt, 2001; 2003; Skoe, 2010), which found a positive correlation between empathy (both cognitive and affective) and moral judgment competence. Positive values of correlation coefficient reflect a linear relationship of variables in adolescents, early adults and adults, who, however, showed negative correlation between moral judgment competence and affective empathy. It could seem that with growing levels of affective empathy moral competence, while higher in adolescents and early adults, diminishes in adults. Further statistical analyses nevertheless highlight the fact that the relationship between moral judgment competence and empathy cannot be explained on the basis of different age levels. Regress analysis has equally revealed that the studied relationship between the observed variables does not

vary with age. These findings are in line with previous research, which did not find age to be the most important determinant of moral judgment competence (Lind, 1993; 2003; Oser, 1986; Rest, 1986). Age does not constitute the most important factor in the observed level of empathy either (Schieman & Van Gundy, 2000; Beadle et al. 2012; Grünh, Rebuca, Diehl, Lumley, & Labouvie-Vief, 2008). The relationship between empathy and moral competence is discussed by Hoffman (2000). He elucidates the processes underlying empathy's arousal and its contribution to moral judgment competence. Hoffman (2000) also underlines empathy's contribution to the principles of caring and justice, to resolving caring-justice conflicts, and to moral judgment competence.

The validity analyses that are reported in this article support the claim that level of education can stimulate moral competence (cf. Lind, 1993, 2003; Oser, 1986; Rest, 1986). However, these analyses also make it clear that the empathy contributes to the prediction of moral competence beyond educational differences. In line with this, previous research has shown that it is not merely the amount of education but its quality, which fosters moral judgment competence (Lind, 2008b).

5 Conclusions

This study has provided an insight of the moral judgment competence and empathy of the adolescents, early adults and adults. These findings support the theory that empathy plays a significant (and positive) role in moral reasoning. With a better understanding of moral development and empathy, various counselling or educational implications can be derived for assisting adolescents to develop holistically as they venture into the world of adulthood.

The paper has shown attention to the moral judgment competence and empathy. Apart from assessing the cross-cultural generalizability of our findings, research should further develop the educational programs that are available to stimulate moral judgment competence. Our results suggest that, rather than focusing exclusively on directly facilitating moral development, these programs might benefit from incorporating both a character education and empathy programs. Educators should negotiate these issues in order to cultivate an empathy securely connected to morality.

This article argues in defence of the application of an empathy-based approach to moral education. Incorporating these elements might yield additional beneficial effects on moral development. Many researches (Narvaez, 2013; Cooper & Schwartz, 2007; Derryberry & Thoma, 2000) cite longitudinal empirical evidence which suggests that education curricula that highlight and create an environment that fosters discussion about moral issues, plays a significant role in moral development and is correlated with gains in moral development above and beyond that accounted for by maturation.

It was felt that there were two main limitations of the study. The first limitation was concerned with the sample size of study. Participants came from a limited number of secondary schools and universities in Slovakia. A sample of 250 students was not sufficient for any generalization on all students of similar age groups. Further the samples were drawn from a particular location; it would be more acceptable and representative if the samples were taken from diverse localities with students and adults of diverse backgrounds. A large sample from different schools and universities in xxx could have enhanced the generalizability of the results and increased the power of the study to detect significant differences and associations.

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Primary Paper Section: A

Secondary Paper Section: AN

CRISIS MANAGEMENT AND SIMULATION OF PROCESSES AS EDUCATION TOOL

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This study was supported by the Research plan No.VG20102015043 "Simulation of crisis management processes in system of lifelong learning of participant Integrated Rescue System and public services", which is financed by the Ministry of interior of the Czech Republic. (Security Research for the Needs of the State 2010-2015 (2010-2015)).

Abstract: The vision paper deals with the current project named „Simulation of crisis management processes in the system of lifelong education of integrated rescue system units and public administration bodies” that is based on the determination, description, and simulation of crisis management processes. The objective of the present research is to create a tool enabling first-rate preparation for the regional and local authorities, and unit of rescue system¹. This tool will enable the preparation to be performed under conditions maximally similar to those of real situations, including psychological and physical time factors. The paper describes individual tasks of educational process and their phases, means of extraordinary events selection and the progress of the project phase being in progress at present.

Keywords: crisis management, tool of education, extraordinary events

1 Introduction

In 2010 the Faculty of Safety Engineering, VSB-Technical University of Ostrava obtained a project within the Security research of the Czech Republic. This project is called „Simulation of crisis management processes in the system of lifelong education of integrated rescue system units and public administration bodies“(the SIMPROKIM).

The aim of the project is to design a system of lifelong education in crisis management for employees working in the rescue system units and public administration bodies. These employees are divided into crisis management groups and other bodies involved in crisis management in the territorial unit. The educational process is based on the assumption that these employees are expected to have knowledge of security issues of the territory. The educational process will be implemented using a simulation of crisis management in conditions similar to real life conditions, including psychological and temporal aspects.

Crisis management is an important tool in providing assistance to the public during emergencies. A two-stage crisis management model was selected for the needs of this project: the Protection module and the Response module that are graphically illustrated in Figure 1. Note: EE is extraordinary event.

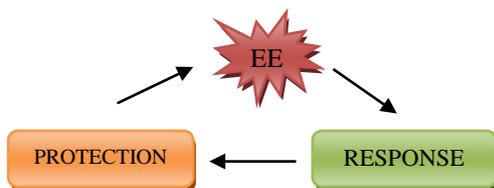


Figure 1: Basic modules

Each module is defined by a knowledge base and set of skills that a participant of the project should obtain during the educational process.

The "Protection" Module includes a complex of activities executed during the preparation for emergency. Generally, it covers identification of possible emergencies in the area, assessing their risks, reducing the effects of emergencies and emergency preparedness.

The "Response" Module in general includes a complex of activities needed for dealing with the consequences of emergencies that occur in the territory.

The educational process in both modules operates in three stages: teaching, training and testing.

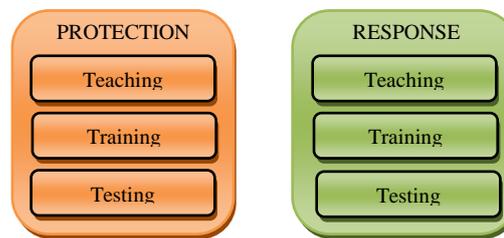


Figure 2: Basic modules – individual phases

Teaching

In general, the "Teaching" phase will have the form of controlled lecture. The instructor will gradually give participants the information about basic attributes needed for the assessment of "Protection", "Response", and "Reconstruction" problems. The instructor's involvement will reach up to 100%.

Training

The „Training" phase will comprise the testing of skills acquired by participants during the previous phase "Teaching" Practice of given problem and correct reaction to emerging situations in the scope of permanent working group field of activity will be part of training. The instructor's should be around 50%.

Testing

Testing of participants, who attended a course or one of partial problems, will be performed in this phase. The aim of this phase is to verify the adequateness of knowledge gained by participants. The instructor's role is minimal, 10% at most.

2 The Protection module

The "Protection" Module is currently focused on the creation of "didactic" texts for the course participants. The aim is to introduce and teach the participants to assess the "security situation" in the territory. The participants will use the knowledge and skills obtained during the course to prepare the crisis management group chairman decision.

Measures to protect the population, infrastructure, and environment belong among monitored parameters of the security situation. A possible occurrence of emergencies in the territory is taken into account.

The assessment of the security situation consists of:

- assessment of the monitored territory characteristics,
- identifying emergencies in the monitored territory,
- identifying safety-significant objects,
- comparison of the current situation in a territory with existing security documentation and
- presentation of differences between the current situation in the territory and the documentation.
- Evaluation of the current security situation is executed for two reasons:
 - to improve existing condition or
 - for the need to prepare a response to the emergency in the territory

The first reason puts the trainee in the workplace of public administration crisis management group with a task to prepare materials for the security situation documentation. For the second reason, the trainee is in the role of crisis management group member. Principally in analysis group of permanent crisis management group.

3 Training center

The training workplace is conceptually consists of several sectional workplaces: the workplace of crisis management group, the workplace of communication with media and the workplace of direction. The whole training system is designed in such a way that the training can be realized either in regular spaces established for this purpose, or in mobile form in the room provided by the subject whose employees will be trained. The software solution in the form of server part communicating with mobile computer workstations, the separate telephone system based on IP telephony, and mobile center for the support of multimedia communication are adjusted to this purpose.

3.1 Software system

Software system supporting the training of crisis management group members has two main functions: simulate the course of crisis situation and support the activities of crisis management group, that the group must perform in order to fight the crisis situation effectively. The system support is planned during the whole organization of training and educational process, from the course announcement to the registration of participants, to creating their accounts, to final issuing of certificates on passing the course.

4 The Response module

The training was held in November 2012 and March 2013 within the "Response" module at the premises of the SIMPROKIM project. The theme of the training was

- floods in 2010 in the territorial self-government (TSG) of Bohumín (real training November 2012),
- flash flood in 2009 in the territorial self-government (TSG) of Nový Jičín (real training March 2013).

The first training was in floods Bohumín. The second training was flash floods in Nový Jičín. The reason was the difficulty in the preparation for exercise and development flash floods.

The aim of the training was to test some of the proposed procedures, especially the time allocation, realistic assignment of tasks in a prepared scenario, reaction of the participants to the assignment and situations and other.

Total training time both exercise was 180 min. Table 1 presents detailed time analysis.

Table 1: Time analysis of the training

Part of training	Time allocation
Introduction to the topic	15 min
Theoretical part	60 min
Break	15 min
Practical part	60 min
Evaluation of the training	30 min

The theoretical part of the training was executed in the form of lectures using audiovisual techniques. The lecture contained introduction to the security situation in the territory and information necessary for the operation of the permanent crisis management group.

Security situation to describe complex information about area:

- describe of area (characteristic of the area - geographic, demographic, climatic and hydrological information, infrastructure, safety or risk objects)
- information about risk and risk evaluation
- map information
- preparing of area at definition risk

In the theoretical part students were divided into roles of the permanent crisis management group.

The permanent crisis management group operated in this composition of roles:

- Dispatcher,
- Evaluator of the situation,
- Resource Manager (Logistics)
- Response Planner
- Representatives of the emergency services bodies and
- Experts chosen according to a type of emergency.

For the training was prepared several documentation

- flood plan,
- hydrologic situation and
- security situation.

For the both training were selected from students of the Safety and Security Planning master's degree programme (Safety planning) at the Faculty of Safety Engineering VSB-TU Ostrava. Students were put in the role of permanent crisis management group members of the territorial self-government.

Presentation of theoretical part was the same for both training. The difference of both training was in scenario situations and practical part of the training.

4.1 Training of flood in Bohumín

In the practical part of the training, the trainees were introduced to the situation of the territorial self-government of Bohumín, hydrometeorological situation and other necessary documents (e.g. emergency plan). After that, according to the scenario (see table 2), the trainees were informed about the development of the situation in the self-government territory and about their tasks by an operator. The trainees were to perform their tasks immediately or to prepare proposal of the solution for the discussion of the permanent crisis management group. Trainees were intentionally working under time pressure. The reason was to provide participants with partial stress environment. A technical support was available for the participants: laptop, SmartBoard, video conferencing system.

Observers of the training then observed the communication between members of the crisis management group and the correctness of the proposed measures and procedures. Training was captured on video recording for other use of the project.

Table 2 Example of a list of information and tasks

Character of report	Date	Time*	Text
Information	29.11.	10:00	river level rises
Task	29.11.	10:02	water pumping
Task	29.11.	10:05	evacuate hospital

*it is real time of flood

The evaluation of the training was executed with the participation of trainees and the SIMPROKIM project working team. Head of the permanent working group summarized the work of trainees during the training, execution of the assigned tasks and prepared proposals for measures. Findings shown in Table 3 for training Bohumín.

Table 3 Table 3 findings from training assessment – Bohumín

	Findings	Solution
1.	The premises of the SIMPROKIM project determined for the work of the crisis management group are relatively small and practically don't allow to execute a training	After completion of the extension and renovation of the Faculty of Safety Engineering, suitable premises will be allocated for purposes of the SIMPROKIM project
2.	A geographic information system must be available for the	This tool is being prepared in the course of the project

	trainee	
3.	For further training validation it is necessary to add telephony equipment to the premises	This equipment has already been purchased
4.	Suitable software tool should be used for preparation and execution of the training	A suitable software tool is being prepared in the course of the project

4.2 Training of flash flood in Nový Jičín

The trainees (students) were introduced to the situation on the territorial self-government of Nový Jičín. According to the scenario (see Table 4) were informed of developments in the territory and tasks. Tasks had to solve promptly in a stressful environment (time pressure on the trainees). Observers of the training then observed the communication between members of the crisis management group and the correctness of the proposed measures and procedures. During exercise was used a form of "time jump" - this is the shift operating time. A technical support was to same as for training situation in Bohumín - laptop, SmartBoard, video conferencing system. Training was captured on video recording for other use of the project.

Table 4 Example of a list of information and tasks

Character of report	Date	Time*	Text
Information	19.3.	21:00	river level rises
Information	19.3.	21:02	static distortion of the dam
Task	19.3.	21:03	ensure accommodation for the people

*it is real time of flash flood

The evaluation of the training was executed with the participation of trainees and the SIMPROKIM project working team. Findings shown in Table 5 (new findings) for training Nový Jičín were observed during the training. Points 1 to 4 are to same problems as in training situation in Bohumín (it is in solving).

Table 5 findings from training assessment – Nový Jičín

	Findings	Solution
1.	Use of mail, ICQ, SKYPE to receive information only one member	This member will decide whether the information is / is not important for other members – saving time
2.	Need to see real and operating time for the trainees.	Use a separate screen for these times.
3.	Trainees give a choice of functions.	It will be tried at the next training.
4.	For longer training need to prepare technical support - phones, GIS applications, shared documents for trainees.	It is in solving.

5 Summary of findings from both training

On the basis of practice are gaining weaknesses in the training. These experiences are then used in the creation of new exercises. Some don't immediately implement in practice. Software support is developed.

The first scenario was created for situations (floods) in Bohumín. Experience has shown that it is necessary to use additional technical support - phone and software support - GIS. To exercise students were selected master's degree (wider knowledge in the area).

The second scenario was created for the situation (flash flooding). Here again showed the need for technical support (for additional exercises will be provided). Trainees were the same as

in the situation Bohumín of the Safety and Security Planning master's degree programme. Here it was shown that they have the experience of previous exercises (better response). For further training are selecting students for doctoral studies.

The second training gave important knowledge to be applied when creating the next exercise.

6 Conclusion

This article captures the SIMPROKIM project that focuses on crisis management training for employees involved in the rescue system and public administration bodies that are involved in crisis management groups and other bodies involved in crisis management of the territory. A module called "Privacy" is described within an interactive learning environment. In this module participants are introduced to security problems in the territory. Within the "Response" module a training that took place in the premises of the SIMPROKIM project in November 2012 (flood in Bohumín) and in March 2013 (flash flood in Nový Jičín) is presented.

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Primary Paper Section: A

Secondary Paper Section: AM

EMOTIONAL BONDS IN PERCEIVING EMOTIONAL CLOSENESS AND PERSONAL WELL-BEING IN PARTNER RELATIONSHIPS AND GENDER DIFFERENCES DURING ADOLESCENCE

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Abstract: Interactive relationships are necessary for personality formation in all stages of life, but adolescence is a period of finding a partner; and we are interested to find out how the emotional bond with a partner reflects emotional closeness in comparison with individuals without a current relationship. In this study, we will focus our attention on the relationships of adolescents in accordance with family and partners, as well as their personal well-being. We are interested to what extent there are differences in the subjective living and the need to start a relationship across both genders. The research sample consisted of university students of humanities and economic studies (N= 98, M=23, 97; 19- 24 years) in Trnava and in Galanta (UCM, BIVŠ, UJAK). A substantial proportion of the sample represents female adolescents who are in a romantic relationship for at least a year

Keywords: family, relationships, partner relationship, personal well-being, adolescent

1. Introduction

Everyday life situations show the importance of emotional relationships which are based on emotional closeness. A question of emotional closeness is therefore a question of accepting and giving social support, particularly in areas of understanding and trust.

Such relationships are the basis for offering social support. Krivohlavý (2003) states that the impact of social support on mental health is significant. The way an individual perceives social support speaks volumes about how subjectively a quality of the whole set of social relationships that are available to an individual is perceived.

Emotional contacts and emotional ties effect the development of personality in a stimulatory way and help an individual in search for life views. Emotional closeness brings confidence and happiness which represent a powerful source of experiencing mental and social well-being. Emotions such as joy and enthusiasm are a signal of our life satisfaction and a core of social relationships. Emotions associated with the presence of close people reflect on our positive psychological state. Their absence is one of the factors that can destabilise and have a negative influence on the psychological and social world of an individual. Whereas emotional expressions reflect in physiological and psychological aspects of our health, we can conclude that to the large extent the psychological and the social dimensions of personality are a significant factor that determinates the quality of life. Subjective feelings of positive emotions in relationships tend to be evident in life and have a stronger impact on psychological and social functioning as well as on ego strength (Arrive, 2004).

The quality of relationships in the family affects the intimate personal and social relationships. The main category of positive emotional relationships is a sense of security, on the basis of which the individual creates faith or distrust towards other people. Positive emotional ties are an important factor in maintaining a mental balance and forming a healthy emotional stability of an individual. These interactions are reflected in the overall quality of interpersonal relationships. The quality of mental health factors are reflected in the personal well-being. This is a dynamic process which affects our inner harmony and spiritual balance. Mental balance shows in our general mind well-being and in functional relationships which we consider valuable. Thanks to the influence of this interaction, the personal potential of an individual can develop further. The environment in which we feel comfortable is a source of a social well-being and this is reflected in our personal well-being. Interactive relations characterise a potential which effects the personality development of an individual. A relationship can then be considered as a positive psychological factor, affecting the

mental health and personal well-being of an individual (Kras, 2001), Nakonečný (2008).

In adolescence, the quality of relationships reflects in an ability and willingness to hold a companion, or a friend. The peer relationship is based on this principle. As Vágnerová (2000, 2010) states, the value of partnerships importance makes up a large potential of social support. Social support can then be seen as help to a "soul mate". Interaction here is then enriched by a partner's affection, or love. Spezzano (2009) adds that the relationship is the best device, thanks to which we can experience love and happiness. A relationship allows us to connect with others, even provoke us to do so. Interaction with others, giving and sharing deepens a meaning and direction of our lives. In addition, we can even say that an emotional support and understanding is responsible for a creation of personal well-being of an individual. Kondáš (2002) highlights mutual understanding as the core of social support. An emotional support of people close to us helps us to find comfort.

Social support is an important factor in the development of an individual's personality. In the early period of life, the main source of support is parents, who largely shape the future relationships towards him or herself or to other people. Positive emotional bond 'the parent – child' relationship is formed and gradually deepens; it is also a source of mental and physical well-being of a child. Social support and its manifestations in the form of security protection are the 'pillars' in the development of a personality. It forms the basis for emotional stability throughout life. A romantic relationship in the period of adolescence is an important factor for an emotional fulfilment. Emotional experiences from childhood interfere in the period of adolescence, and can significantly affect an individual's relationships.

Adolescence is the second phase of a relatively long period of growing-up. It takes about 15 to 20 years to stabilise some individual variability in psychological and social areas. Entrance to the stage of adolescence is biologically limited by a sexual maturity. It is a period of comprehensive psychosocial transition. The period of adolescence is influenced by two social milestones. The first is completion of compulsory schooling, and the second is preparing for a professional life. Preparation for a career is associated with an economic independence, which firstly occurs among pupils and later in undergraduates (Rican, 2010). The period of adolescence can be seen as a bridge to adulthood, where the transition is obvious due to an economic independence and need to be independent. In this regard, Vágnerová (2000) states that for many adolescents adulthood is not that attractive and they are trying to delay the process of growing-up. The author also sees this period as a "cult of immaturity", which affects adolescent behaviour.

With regard to immaturity, the data obtained from adolescents confirmed that men have short-term relationships in this period of life. Adulthood can be understood as a social milestone, when adolescents gain more life experiences. The duration of this period is described as a psychosocial moratorium by Erikson in Rican, 2010.

Economic and social conditions of the society as well as the current lifestyle of young people have resulted in a slower independence process and often cause a longer and stronger dependency on parents. Despite this fact, there is a strong need to find a soul mate, or a partner.

However, we can say that a partnership of adolescents has an effect on a lifestyle, developing identity and in search for personal satisfaction, happiness, success and so on.

As an adolescent gradually matures, the need for a fulfilling partnership grows. The need for such a relationship is becomes a

necessity for psychological, social and physical development (Vágnerová, 2000). "Some values are common to entire mankind" (Maslow, 2000). This value is called love and it occurs at the forefront of the value chain of adolescents. The need to develop emotional relationships is not only tied with parental love, but also with a partner love. Parts of the internal structure of human beings are not only physical needs but also psychological needs (Maslow, 2000). Such a need for love is involved in shaping the psychological health of an individual. As reported by several authors, eg. Vágnerová (2000), Langmeier, Krejčířová (2006), as an individual's personality matures; it results in identifying a range of values, which are important to an individual. Partnership and love belong to the most important values in the period of adolescence. According to Frankl (in Krivohlavý, 2003), a partnership can be considered as a significant factor for a meaningful life.

Partner relationship can be considered as a source of mental and physical well-being and can become the main purpose of life for many individuals. Grun (2011) notes, that romantic love plays a big part in searching for 'the meaning of life'.

A strong emotional relationship gives the direction of human existence, motivates to action, integrates and directs the existence of an individual and helps his well-being. It therefore distracts attention from itself and meaningfully fulfils the life of an individual. According to Grün (2011), one needs and desires relationship. However, we live in 'the era of individualisation' which is resulting in people not concentrating on forming a partner relationship, but their energy focuses more on the development of their own lives.

The current need for individualisation leads to the development of skills for self-improvement and pursuit of personal goals, which may also become the meaning of life for some. Spezzano (2009) in this regard, states that the need for individual excellence can stop us finding a mutual proximity in romantic relationships.

Individualisation can greatly develop the psychological dimension of an individual in terms of saturation over other values, such as partnership and love. Kofman (2010) states that some people limit their own spiritual activities over their work-related activities, which can define their personal and social identity. According to Grenberga (2001), adolescents may be affected by existing social politics, changes in the legal system and the mass media.

In a study devoted to the meaning of life (Mičková 2012.2013), we found out that young people are capable of subjectively experience psychological well-being without being in a relationship. These findings support Kofman's (2010) argument about the individualisation of personality. To some extent, individualisation may be an obstacle in strengthening love.

According to Spezzano, relationships have healing power. In addition, the author thinks that in order to reach excellence, partners need to give and receive admiration and love at some level.

In 2012, we conducted research based on a sample of young adults. Our findings demonstrate the importance of emotional relationships and emotional closeness during a period of young adulthood. Perception of friendly, personal and sexual relationships is perceived stronger by individuals who have a romantic relationship, while the greater emphasis is on personal relationships rather than sexual relations. The quality of emotional support or emotional closeness is significantly influenced by existing partner relationships. We can then conclude that if an individual is in relationship, the perception of their social support is significantly higher when compared to individuals who are currently not in a relationship. We think that even if we build our personal happiness on certain values, which are to some extent shared by all of us, emotional relationships and positive emotional bonds give an individual a sense of joy and happiness. The quality of partner relationships is reflected in

the personal well-being of an individual who is then able to concentrate on work and rest, and also on working efficacy.

Emotional saturation is a prerequisite for a good quality of being in all stages of life (Smith, 2001, (Křivohlavý 2009) and it is an important prerequisite for quality of life. Individual findings and search can be found for example in Harinekova's research in (2003, 2004), Matějček (2002), Sobotková (2007), A Keys Ryff (1995), Rhoades (2008), Ruiselovej (2006), Greenberger et al (2001) and others.

Cobb (in Hewstone, Stroebe, 2006) defines social support as a summary of information from people who love and show interest in themselves. The author sees individuals as part of a communication network with mutual obligations. Sobotková (2007) states that family relationships are the foundation of emotional saturation. According to the author, they are defined by the existing intensive and continuous psychological and emotional ties. Gecková, Pudelský, Tunistra (2001) conducted a research which showed that adolescents do not experience adequate social support in their social environment. This insufficiency was mostly missing from their mother. Končeková (2002) states, if parents are unable to adapt to the needs of the individual adolescent, their relationship might be damaged.

2. Research objectives and the research sample

The research focuses on the period of adolescence in the context of interactive relationships of adolescents in the areas of emotional ties, social connections, and the perceived psychological and physical well-being. We want to determine the level of satisfaction and mental and physical well-being level of emotional stability while comparing the perception of a social support in partners and individuals who are currently not in a romantic relationship. We are interested in partner relationships as well as family relations of adolescents. The research sample consisted of university students of humanities and economic subjects (N = 98, M = 23.97; 19-24 years) in Trnava and Galanta (UCM, BIVŠ, UJAK). A substantial portion of the sample represents female adolescent who met the criteria of being at least one year in a romantic relationship.

3. Hypotheses

H1 We expect that individuals in a romantic relationship will experience greater emotional support compared to "single" individuals.

H2 We assume that the perception of emotional closeness will be more greater in adolescents with more positive relationships within the family.

H3 We assume that the perception of emotional closeness will be greater in adolescents with higher levels of trust in interpersonal relations.

H4 We assume that experiencing emotional closeness is reflected positively in experiencing physical and psychological well-being.

H5 Adolescents with higher levels of emotional weakness will not perceive emotional closeness as strongly as individuals with higher levels of emotional strength.

4. Research Methods

Research methods were chosen in accordance with studied variables. To obtain demographic data and information on their current parent relationship, we created our own questionnaire which also includes information such as age, relationship status and sex. This data is considered as important for creating a homogeneous sample.

For finding emotional closeness, we used the Social Support Questionnaire (MOS). This questionnaire was originally developed by a group called Rand Medical Outcomes Study under the name Social Support Survey (MOS). It is an indicator of social functioning in the general population. It focuses on the estimation of anticipated social support. It also reflects an individual's subjective interpretation of his social presence. The use of the questionnaire was regulated in 2002. The regulation

was implemented by Kozeny J. and Tišanská L. The shortened Czech version consists of 18 items involving three dimensions. These are: Practical intervention, Emotional closeness, and Understanding authority. Practical intervention corresponds with Tangible Support from the U.S. version which states that emotional closeness is an expression of the American factor, Affectionate Support; this authority includes the U.S. factors: Positive Social Interaction and Emotional Informational Support. In this amended form, respondents score points on the five-point Likert scale. Each component reflects one of five grades. With respect to the suggested hypothesis, we only used a scale which detects a level of emotional support or emotional closeness. From a choice of personality questionnaires, we used the multi-factor personality questionnaire for adolescents - Miglierini's personality questionnaire, which understands the personality profile as 'an open system'. We are interested in emotional willingness, emotional family relationships, relationships with other people and physical and mental well-being. These factors are examined in relation to their current experience of emotional perception within a partner relationship. Social domain aims to obtain data about a subjective satisfaction in social relationships and intimate partnerships. Findings (based on the theoretical resources) suggest that emotional closeness is a source of emotional saturation; we used the social support MOS questionnaire in this case (emotional closeness range). The answers provide information about the perception of emotional closeness, or about the quality of social support. Our own questionnaire helped us to split individuals into several research groups. We were mostly interested in the length of a partnership and the perceptions of individual adolescents (how they characterise their current relationship - either romantically or sexually).

We consider emotional stability as a very important component of the psychological profile of every personality. The complex factor contains the following measurements: dimension of calm - restless, dimension of reassurance - inferiority feelings, dimension of personal balance - mental weakness, dimension of mental stress - mental looseness, and dimension of optimism - pessimism and dimension of mental and physical freshness - various neurotic symptoms.

To achieve our objectives, from the personality questionnaire, we also chose family relationships as we generally consider them to be the major factor in shaping the personality traits of an individual. The questionnaire provides answers based on the dimensions of negative - positive family relationships. Assumption for the personality balance is physical and mental well-being, which is examined by the dimension of health - health problems.

5. Interpretation of Results

Table 1 includes descriptive characteristics of basic variables that were included in the research. Characteristics are calculated on a sample of 98 respondents. The average value obtained in social support is 75.19 ($\bar{S}O = 13.83$), the values are in the range of 10 to 90 points, the median (79) and modus (86) have a higher value than average.

Values of emotional stability varied from 8 to 55 points, with an average of 31, 57 ($\bar{S}O = 9, 62$). The median is close to the average (30), modus as the most common value is higher from the average of 8 points (38). The average variable in family relationships was 10, 77 ($\bar{S}O = 4.68$), median (10) and modus (9) are slightly lower than average. The value range varies from 2-25 points. The variable for Welfare and Relationships with other people, respondents could score from 0-10 points. The variable Well-being, respondents achieved the full range of values; the variable Relationship with people, the minimum value was 1. Average Variables: Welfare = 4 ($\bar{S}O = 2.44$), relationship with other people = 5.55 ($\bar{S}O = 2, 20$). Median of the variable Well-being was equal to the average; the variable Relationship with other people was slightly higher than average (6) and equal to the most common value - the modus, while the variable Well-being is the most common value 1, which is significantly lower value than the average or median.

Table 1 - Descriptive characteristics of variables -social support, emoti. stability, family relationships, physical and mental well-being, relationships with r people (N 98)

N 98	1	2	3	4	5
Average	75,19	31,57	10,77	4,00	5,55
Median	79	30	10	4	6
Modus	86	38	9	1	6
Deviation	13,83	9,62	4,68	2,44	2,20
Variance	191,19	92,64	21,91	5,94	4,85
Minimum	10	8	2	0	1
Maximum	90	55	25	10	10

Legend: 1 social support, 2. emotional stability, 3.Family relationship, 4.well Being, 5. relationship with other people

Table 2 shows the result of testing H1: *We expect that individuals in a romantic relationship will experience greater emotional support compared with "single" individuals.* The variable Social Support was not distributed equally, we decided to use a non-parametric Mann-Whitney U test. The result demonstrates a statistically significant difference (Sig. <0.001) in social support among individuals without a relationship, while higher levels of social support are obvious in a group of individuals who currently have a romantic relationship. Therefore, the hypothesis was accepted.

Table 2 - Social support in relation with romantic relationships (N 98)

	Relationship	N	Average Order
Social Support	Yes	55	59,01
	No	43	37,34
Mann-Whitney Test			
	Social Support		
U		659,5	
Z		-3,748	
Sig		0,000	

In Table 3 we can see calculations of the Mann Whitney U test which helped us to detect differences in social support among a group of women without a relationship, and women in a relationship. According to our results, women who are currently in a relationship show a greater closeness than women who are not in a relationship. The statistical significance is at the level of Sig. ≤ 0.001 .

Table 3 - Social support in relation with romantic relationship in women N (87)

	Relationship	N	Average Order
Social Support	Yes	51	51,38
	No	36	33,54
Mann-Whitney Test			
	Social Support		
U		541,5	
Z		-3,248	
Sig		0,001	

Table 4 shows a sample of men. Due to a low number of men, we decided not to interpret the result.

Table 4 - Social support in relation with romantic relationship in men N(11)

	Relationship	N	Average Order
Social Support	Yes	4	7,50
	No	7	5,14
Mann-Whitney Test			
	Social Support		
U		8	
Z		-1,136	
Sig		0,256	

H2 : We assume that the perception of emotional closeness will be greater in adolescents with more positive relationships within the family. We expect that higher adolescents perceive positive relationships within the family, the higher they perceive emotional closeness.

To verify this hypothesis, we used the calculation of Spearman rank coefficient (variables are not equally distributed). As shown in Table 5, there is statistically no significant difference between social support and their family relationships (Sig. > 0,05) . The hypothesis is therefore rejected.

H3 : We assume that the perceived emotional closeness will be noticeably higher in adolescents with higher levels of trust in interpersonal relationships – we assume that the higher the level of trust they have, the stronger they perceive emotional closeness.

This hypothesis was verified by calculating the same as in H2 (Table 5). The result does not show a statistically significant relationship between variables (Sig. > 0, 05). The Hypothesis is therefore rejected.

H4: We assume that experiencing emotional closeness is reflected positively in experiencing physical and psychological well-being - We expect that the perception of emotional closeness relates to the perception of experiencing physical and mental well-being.

This assumption was verified in the same statistical criteria as the previous assumptions and results can be seen in Table 5. As we can see, there is no statistically significant relationship between social support and well-being in the whole group (Sig. > 0.05). The Hypothesis is therefore rejected.

H5: We assume that between perceived emotional closeness, and emotional stability, there is some form of relationship. Test Results - Spearman correlation coefficient are shown in the Table 5. As we can see, there is a weak negative relationship between social support and emotional stability, which is slightly statistically higher than the acceptable value (Sig. < 0.065). We therefore reject the hypothesis, but the relationship can be still discussed, especially if it is negative - more stable individuals can experience social support more significantly.

Table 5 - Spearman correlation coefficient contains the following variables - Relationships in the family and towards other people, well-being, and emotional stability. (N 98)

	Family	People	Well-being	Emotional Stability
Spearman's social support	-0.135	-0.150	0.018	-0.188
Sig.	0.184	0.142	0.863	0.063

In Table 6, we present results for the relation between social support, family relationships and relationships toward other people, well-being and emotional stability separately for men and for women. Due to a low number of men, we cannot generalise the results. In the table below, we see a statistically significant relationship (Sig. <0.05), and this is between social support and family relationships in men (N = 11!). It is a very strong negative relationship (rho = -0.734), which means that perceived social support is stronger among men with a more positive family relationship. In women, we found no statistically significant relationships.

Table 6 - Spearman correlation coefficient contains the following variables - Relationships in the family and toward other people, well-being, and emotional stability divided by gender. Men (N 11), Wumen (N 87)

Men	Family Relationships	Relationships towards other people	Well-being	Emotional stability
Spearman's social support	-0,734	-0,230	0,500	0,263
Sig.	0,010	0,496	0,117	0,434
Women	Family Relationships	Relationships towards other people	Well-being	Emotional stability
Spearman's social support	-0,051	-0,123	-0,001	0,195
Sig.	0,636	0,258	0,990	0,070

In table 7, we can see specific calculations between social support variables which have been observed above, particularly in individuals without a relationship, and individuals in a relationship. As we can see, a statistically significant relationship is detected between social support and emotional stability in a

group of individuals who are in a relationship (Sig. <0005). This relationship is a weak negative (rho = -0.269), which is interpreted thusly; the more stable relationship a respondent is in, the greater emotional closeness is perceived. Here we also discuss the relationship between social support and the relationships with other people. This relationship is a weak negative (rho = - 0.260), which is just on the edge of the acceptable statistical significance (it slightly exceeds the Sig. ≤ 0.055).

There were no statistically significant relationships shown between the variables in the group of respondents without a partner relationship. (without relationship N 43, relationship N 55)

Table 7 - Spearman correlation coefficients – Emotional stability, relationships, well-being in relations with partner relationships

Without Relationship	Emotional Stability	Family Relationships	Relationships toward other people	Well-being
Spearman's social support	-0,270	-0,171	-0,160	0,021
Sig.	0,079	0,274	0,307	0,893
In Relationship	Emotional Stability	Family Relationships	Relationships toward other people	Well-being
Spearman's social support	-0,269	-0,114	-0,260	0,050
Sig.	0,047	0,409	0,055	0,716

6. Discussion

Adolescence is considered as a period of forming relationships. We think that these social relationships help to ease this period and assist in the creation of a mental balance. Although we have not studied who is inducing this emotional saturation, the significant positive relationship between emotional support and partnership was determined in the whole group. Gender differences are interesting in women who perceive social support significant stronger if they have a partner.

For men, this result was not interpreted due to a low number of respondents.

It can be concluded that women have a higher tendency to bond with a partner. Partner relationship is not however the only interactive bond, which saturates emotional closeness, it can be also provided by parents and friends. This fact is also supported by our results where we investigated the relationship between social support and family relationships. In this context, there is a significant relationship between social support and emotional stability. This result is not linked to the current partnership of adolescents. We also confirmed that perception of emotional closeness at a higher emotional stability is linked to a partnership. It also confirmed that people in partnerships have a greater confidence in people.

Social support is also related to emotional relationships within the family. It can be stated that experiencing emotional support is not near as important as the adolescent evaluates the relationship of parents and their actions but what emotional ties he/she has with their parents. The emotional attachment toward parents can be seen as an important factor for social support among adolescents, despite the fact that interpersonal interactive relationships are beginning to strongly stimulate in the adolescent's life. This emotional environment represents itself as a safe territory.

Another important finding is that emotional stability is related to the experience of social support. It can be discussed that individuals with a sense of certain safety without any neurotic symptoms, are able to experience positive emotional presence of close people. Since the perception of relationships in the closest family and a sense of well-being in relation to social support weren't confirmed, we can conclude that emotional stability is saturated by many other factors. An interesting result of the examination of gender dimension was found, where especially men perceive social support in relation to a positive perception of family relations, while in women, we didn't confirm a statistically significant relationship to the family and social support. Due to a low number of men, we would recommend this interesting result for further exploration. Based on the theoretical and practical knowledge, a long-term observation and research support a

theory that despite positive family relationships, everybody's development is different.

We focused on the period of adolescence and its definition in the context of interactive relations, respectively in the definition of current partner relations. We were interested in experiencing emotional closeness in relation to love, and in connection with the personal feature of emotional stability, as well as in relation with experiencing a state of mental and physical well-being in relationships towards people and the family. A perception of emotional closeness is higher among adolescents in a relationship. The adolescent period is dominated mainly by passion, which can be seen particularly in close contact with a partner. Due to the length of the partnership and a quality of a relationship (eros) it is possible, that this can be considered the most important factor for emotional well-being. This conclusion can be picked up especially in women who belong to a longer partnership, in comparison with men.

Another finding claims that emotionally stable individuals are experiencing significant social support. In this context it would be interesting to conduct a regression analysis and find out in which direction this is affected. Given that the sample is not representative, a regression analysis cannot be done.

Another finding showed the negative relationship between social support and emotional stability of adolescents in a relationship. Experiencing emotional closeness is associated with higher rates of experiencing social support. The findings also point at the importance of social support in relation to emotional relationships within the family. This finding underlines the importance of emotional bonds, particularly in relationships with parents. Even though adolescence form new relationships, parents continue to occupy an important place in their lives.

A significant relationship was found between social support and the emotional attachment to the family in men, while it was not in women. The number of men was low, and therefore it is not possible to generalise the results. Nonetheless, this is a strong negative relationship regardless of the low number, and can be interpreted for the whole group.

For significant factors in relation to our research, we consider emotional ties to parents, trusting other people, and emotional stability. The state of physical and mental well-being was shown in connection with social support. This could be discussed further, that another important factor in relation to personality as a mental and spiritual dimension of the personality.

An interesting finding is that men urgently need positive relationships for experiencing emotional closeness in comparison with women during adolescence. This conclusion, however, should be interpreted with caution due to the low number of women included in the research. We could argue about whether it is one of the major factors why men have more behavioural problems. Our findings confirm the importance of positive family relationships, which were also mentioned in the previous research; however it was conducted on boys at primary school. Gender difference was also seen while obtaining demographic data on the length and quality of a relationship. In this context, it can be concluded that only a small number of men were in a relationship for more than one year. We can therefore discuss different ideas about partner relationships.

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Primary Paper Section: A

Secondary Paper Section: AN

REPUTATION CRISIS RESPONSE STRATEGIES ON THE EXAMPLE OF SELECTED POLISH COMPANIES

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Abstract: Reputation is a valuable, but simultaneously highly vulnerable asset and the most difficult to protect asset of enterprise. No company is able to protect itself from committing some errors and avoiding the risk of reputation loss or damage. But the point is to identify the sources and causes of risk and take appropriate action related to compensation tarnished reputation, and so choose the appropriate crisis response strategy. Against this background we present examples tarnished reputation in selected Polish companies (Wawel, Bank Pekao Group, LPP Group), its financial and non-financial consequences and crisis response strategies. In a summary it was concluded that moderate, small, impairment of reputation and a proper reaction of a company can be a positive experience and it can even contribute to the enforcement of reputation in the future.

Keywords: corporate reputation, crisis reputation, crisis response strategies.

1 Introduction

Recovery the corporate reputation after crisis requires to use the rules and procedures for crisis management, widely described in the literature [e.g. Siomkos, Kurzbard 1994; Coombs 2000; Barton 2001; Dean 2004; Coombs 2006; Smith 2006; Coombs 2007; Jaques 2007; Brocato, Petersen, Crittenden 2012]. One of the most crucial activities taken in order to rebuild reputation after the crisis is effective and open communication of the company with the environment [Sturges 1994; Fearn-Banks 1996; Argenti 2002; Coombs 2004a, 2004b; Hale, Dulek, Hale 2005].

The first objective of the paper is to indicate the importance of having effective crisis management plans and tools for an unpredictable reputation crisis event in a company, it is the concept of appropriate crisis response strategy. The second objective is to illustrate, that a positive corporate reputation, as well as a long history of a company and its tradition in the market, can help mitigate the effects of negative events. Finally, in the paper was questioned, suggested by many authors claim, that reputation is a very fragile enterprise resource.

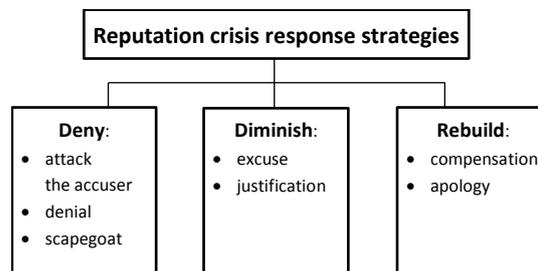
In this article, in order to conduct research, as a research method the individual cases method (the case study) was adopted, relating to the analysis of Polish companies examples in which the reputation crisis was observed as well as an effective process of its rebuilding. Selection of companies from different industries should indicate that problem described in the paper is not limited to a specific industry, but it can affect every company and every company has a chance to fix a mistake.

To create a case studies analysis of researched companies we used numerous press releases, information on the official websites, the messages issued by the researched companies as well as annual and interim reports published by them. In addition, in order to present investors' reactions to reputation crisis and its rebuilding, we made use of information on the shares quotation of the analysed companies.

2 Reputation crisis response strategies

Ways to respond to a reputation crisis situation may be different and their choice is conditioned by many factors. Coombs within the Situational Crisis Communication Theory (SCCT) distinguishes several types of behavior, which he calls strategies to respond to a crisis situation. He points at three primary strategies – deny, diminish, rebuild – and in the second place at bolstering crisis response strategies – reminder, ingratiation, victimage [Coombs, 2007]. The primary reputation crisis response strategies are presented in Figure 1.

Figure 1. Reputation crisis response strategies



Source: Own work based on: [Coombs, 2007, p. 170]

The main idea of deny strategies is to convince the public that the organization is not experiencing any crisis (denial or attack the accuser), or that any problems are not its fault (scapegoat). Diminish strategies aim to weaken the negative perception of the surroundings by proving, that the organization had no bad intentions or had no control over the event that triggered the crisis (excuse), or by insisting, that the damages caused by the crisis are not large and can be quickly fixed (justification). In the rebuild strategies organization assumes full responsibility for the crisis, accepts the losses and tries to fix them. Its activities are focused on providing financial assistance or other compensation for victims (compensation), or rely on public recognition of their sins and asking for forgiveness (apology).

A similar approach to the possible response to the crisis situation presented K. Wojcik, distinguishing five of the following strategies [Wojcik, 2009]:

- Dodging strategy – the organization behaves as if the crisis situation did not concern her at all: remains silent, argues that there is no connection with the crisis or submit the conflicting messages;
- Denying strategy – the organization responds immediately informing that did not cause the crisis, nor participate in it;
- Defense strategy with standards rejection – organization defends its decisions and actions that caused the problem, referring the use of other standards;
- Defense strategy with using the responsibility issue – the organization explains their actions, trying to convince the surroundings, that it is not responsible for the creation of a crisis;
- Acceptance strategy – organization accepts all charges, accepts responsibility, apologizes and corrects errors, and promises to improve.

The effectiveness of these reputation crisis response strategies depends to a large extent on respect for the truth principle and stakeholders reaction. In cases of the truth principle breach (dodging and denying strategies) the problem is not resolved, it passes into a state of latency and can transform into a much bigger crisis. Then reputation risk is very high. With regard to the defense strategy with violation of the truth principle risk of reputation damage is significant. While observing that principle the level of risk depends on organization's stakeholders reaction. It seems, that the lowest risk to organization reputation generates the acceptance strategy, provided, that the truth principle is also observed, i.e. that organization actually accepts the charges and repairs the damage, and does not do so within the framework of considered and temporary tactic.

3 „WAWEL” Confectionery Company – insects in chocolates

Manufacturer of sweets Wawel prides itself in over one hundred years of tradition on Polish and European market. The company's head office is located in Cracow. Corporate reputation means

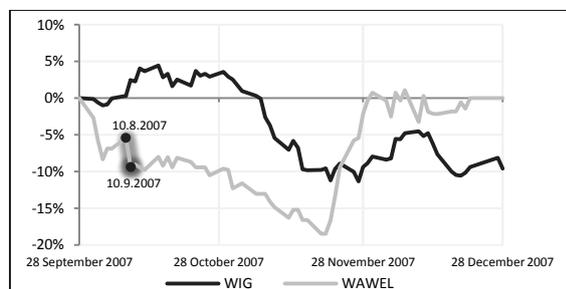
the quality of products, „based on tested recipes and the raw materials used are of the highest quality and are subject to detailed control” [www.wawel.pl, 30th August 2012]. Chocolate products soon gained huge popularity among the connoisseurs and became one of the symbols of Cracow (Wawel is the name of a residence of Polish kings located in Cracow).

However, corporate reputation was put at risk as a result of a crisis which was related to the detection of insects in filled chocolates – Kasztanki – in October 2006. After a phone call from a customer to one of the newspapers information spread immediately on the Internet. An image and reputation of Wawel company was seriously affected. However, the company did not take up any corrective actions. What is more, the head of technological department tried to convince journalists that there was nothing unusual and the insects (*Ephestia Elutella*) found in sweets were harmless to human health. He also added that the factory is under constant control of sanitary and epidemiological station [Zadroga A., 9th October 2007].

Nevertheless, this described in the press case caused further flurry of reactions. This issue was taken up by media. Although the main topic in traditional forms of media was discussed only for two days (9th and 10th October), on the Internet it was raised for several months.

For Wawel as a listed company, the most crucial was the information published for investors. Crisis, through media, spread to the next group of stakeholders of the company – the shareholders who reacted with over four per cent drop in Wawel’s shares on the Warsaw Stock Exchange (Figure 2). The company reacted to the crisis not earlier than after two days (11th October) publishing management representation in the form of a current report [www.wawel.com.pl/gielda/?pg=rapoty-biezacy&id=4183, 11th October 2007].

Figure 2. Changes in stock quotes of Wawel and WIG index on the Warsaw Stock Exchange on a cumulative basis before and after a crisis event (reference date: 28th September 2007)



Source: Own work based on quotes data from www.stooq.com.

Moreover, it established cooperation with PR Network in the course of which the following steps were agreed upon:

- Corrective actions aimed at calming the media storm including, inter alia, a proposal to sanitary and epidemiological station for a comprehensive inspection;
- Actions dedicated to employees which included meetings regarding the situation of the company.

The results of inspections together with a favorable opinion of sanitary and epidemiological station got to business partners and the media [www.wawel.com.pl/oswiadczenie20071017/komunikat.html, 12th August 2008]. This argument convinced investors and customers. As shown in Figure 1, the market reacted positively on corrective actions of the company and thus, the negative influence of the event mentioned above was limited only to one session. In the course of further quotations company’s shares returned to correlation with the main market index (WIG) and after a positive quarterly report, presented in November, even behaved better than this index.

Wawel managed to get out of the crisis with minor losses, although in first comments following the detection of insects in sweets, it was suggested that the company would fall into serious troubles connected with the reputation crisis. Wawel company, immediately after the crisis, did not take up any actions addressed to customers and investors, whereas a statement made by one of the employees had even more negative influence on its reputation.

Fortunately, Wawel realized relatively quickly what mistakes had been made and drew conclusions from this situation. Thanks to the cooperation with PR Network agency it changed its attitude towards preparation for the crisis. Apart from the trainings how to talk to the media, the company was also instructed how to correspond with the customers (inter alia by the Internet website). In order to improve corporate reputation the company was advised to communicate actively with the media and to take up actions within the range of social business responsibility (in the winter Wawel supported actions of Fundacja Przyjaciółka – a charity organization, for the benefit of foster family care). These actions were noticed and appreciated by the stakeholders of the company, including the shareholders, which resulted in its relatively better quotations in relation to WIG index.

To sum up, at the beginning Wawel has applied the denial strategy, claiming that the crisis situation did not have place. After the publication of press, it adopted the diminish strategy, and thus it clarified that the damage was not too harmful and possible to fix. Then it applied the rebuild strategy of reputation.

4 Bank PEKAO Group – Personal data leakage

Reputation is an important element in the activities of banks which as the institutions of public trust are particularly vulnerable to its loss. One example of a bank whose reputation was injured is Bank Pekao Group – one of the leading banks operating in the Polish market. The crisis was related to the leakage of personal data of the candidates applying in the recruitment process which took place in the summer of 2008. From the portal „zainwestujwprzyszlosc” it was possible to download data about addresses, phone numbers and employment history of one and a half thousand people. Within the period from 12th to 19th July 54 publications appeared in the press and on the Internet referring to this topic, 51 of which brought about a negative effect for the bank [Podraza, 2009, pp. 207-220].

The bank reacted immediately calling crisis management center which at once took up operational activities. They were divided into three groups:

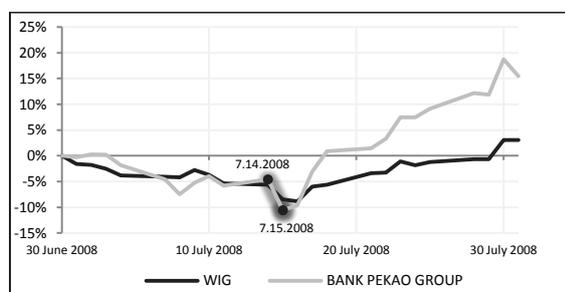
- Activities in the field of information technology to ensure security of data, supervised by the bank’s head of IT;
- Activities related to victim applicants who were addressed by the project manager of HR department;
- Communication activities lead by the spokesman of the bank.

The decision was made to conduct in the first place communication activities addressed to the customers in order to make them feel confident that their data and financial resources deployed were completely safe, in the second place activities addressed to potential victims and in the third – to public opinion. In a published announcement it was emphasized that the creation and administration of the web portal where the leak appeared, was maintained by external company for the bank and the portal itself was set up on external web server. However, quick reaction did not eliminate the problem because lack of proper website security enabled an access to data for a next few hours after the page had been blocked. Information about the leakage spread rapidly in the network and it was the Internet where merciless comments such as: „disgrace, incompetent PR, embarrassing form of the defence of the bank” appeared. This situation had a negative influence on the image and reputation of this financial institution.

M. Macierzyński and L. Radomski on the portal bankier.pl state that „Bank Pekao Group undoubtedly suffered from image loss in this crisis. And it does not matter that the application was prepared and administered by an external company. The role of the bank is to choose the cooperators in such a way that everything could work correctly and safely. And personal data is the most crucial thing for the bank” [Macierzyński, Radomski, 14th July 2008].

Reputation crisis of Bank Pekao Group did not in fact cause serious losses in bank's activities in the form of customer attrition, but it affected negatively its image as well as financial results in the form of the costs of error correction and PR activities. From the stock market point of view the crisis described above, as in the case of Wawel, had only a short-term negative effect on the stock quotes of Bank Pekao Group on the Warsaw Stock Exchange (Figure 3). After a one-day drop in quotes, which was relatively greater than in the case of a main stock index on the Warsaw Stock Exchange (WIG), on successive sessions the shares of Bank Pekao Group behaved much better than this index.

Figure 3. Changes of stock quotes of Bank Pekao Group and WIG index on the Warsaw Stock Exchange on a cumulative basis before and after a crisis event (reference date 30th June 2008).



Source: Own work based on quotes data from www.stooq.com.

It should be also noticed that the bank drew conclusions from this difficult lesson and took up preventive actions for the future. First of all, personal data from each recruitment process and trainings since that time are stored on well-protected bank servers. Moreover, in September 2008, therefore very soon after the incident, a cycle of trainings in the field of personal data protection and security policy of the bank was conducted.

In the context of the above-mentioned types of strategies, firstly Pekao applied the denial strategy of repression (scapegoat). Bank tried to blame an external company, which was responsible for the operation of the portal. Then adopted the diminish strategy by taking appropriate measures in the field of PR. Applied strategies yielded results in the form of restoration of confidence in the bank, which was confirmed by the quotations of stock prices. It should be noted, that Pekao has not escaped some errors:

- wrongly identified group of stakeholders who were mostly concerned about this problem (it turned out that they were not the customers or potential victim applicants but Internet users);
- an attempt to blur responsibility through pointing to an external company which was engaged in the process of creation and administration of the portal where the leakage appeared.

5 LPP Group – unsuccessful collection

LPP Group is an enterprise which is engaged in designing and distribution of clothes in Poland and countries of Central and Eastern Europe. Specification of LPP is based on a combination of design, distribution and marketing activities [A. Leder, 20.12.2004]. The company supplies a wide range of clothes representing the latest trends in the fashion world.

The offer is addressed to different groups of customers, offering them a distinct brands and chain stores. The company launches on markets clothes under the following brands: Reserved, Cropp, House, MOHITO, Promostars, Sinsay.

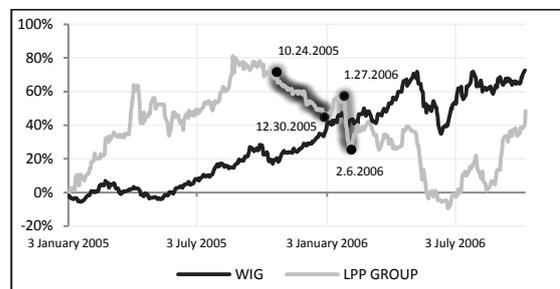
LPP uses a variety of distribution channels. For each of its brands it uses distinct methods of promotion and distribution. Currently, distribution of clothing focuses primarily on retail sales through a network of company-owned stores, which functioning within the framework of franchising. In addition, LPP provides its products to wholesalers, retail chains, as well as for export to the countries of Central and Eastern Europe.

The current scope of activity the company, related to the presence in the markets of Central and Eastern Europe, it would not be so extensive, if not the company's reputation. Reputation LPP has been created for years, beginning in 1997, when it was born the brand – Reserved. Then, it was also created the idea of the company's activities, which were associated with the design of clothes and its distribution, while production was commissioned outside. The company's headquarters employed Polish designers, then the projects were sent to Asia, and there were sewn clothes according to their own designs. In addition, LPP strengthened his reputation by every seasonal collections of clothes such brands as Reserved, Cropp, and after in 2008 the acquisition of the firm Artman – also House and Mohito.

However, at the turn of 2005 and 2006 the reputation of the LPP Group was tarnished.

The crisis was associated with the autumn-winter collection, which turned out to be completely unsuited to the market needs. „I think we wanted to be too trendy, but Poles turned out to be too conservative. Our clothes were too extravagant. We went by the trends prevailing in the world” [Estrawagancja nie popłaca, 13.11.2006]. During the crisis, brand Cropp was specified for the target group of young people aged 13-18 years. However, research has shown that the clients are also consumers aged 25 years, and older. Therefore, it was decided to expand the target group, which was associated with the new character of collection. Changes also related advertising, which was addressed to young people, but not „kids”. The crisis also embraced a leading brand Reserved. In autumn 2005, the firm started rebuilding the image of the brand Reserved, from lifestyle and casual for all people, in direction fashion's brand for demanding and constantly waiting for new customers. It turned out, however, that the direction was too revolutionary, and the number of customers bent on challenging of modern clothes was much less than expected.

Figure 4. Changes of stock quotes of LPP Group and WIG index on the Warsaw Stock Exchange on a cumulative basis before and after a crisis event (reference date 3th January 2005).



Source: Own work based on quotes data from www.stooq.com.

The crisis of reputation firstly moved into a decline in sales. Domestic sales of Reserved brand in the first quarter of 2006 dropped by 6.5%, which translated into a decline financial results, and this resulted in a negative reaction from a group of shareholders (Figure 4). Jan. 31, 2006, the shares of LPP Group decreased by 11.5% as a result of the second revision

of the forecasts of net profit (the first of the 60 million to 53 million, and then from 53 million to 40-44 million PLN).

Presented a kind of crisis reputation was associated with errors in determining the target group and maladjustment offer to the needs of customers. LPP quickly realized what mistakes committed. In the next autumn-winter collection (2006/2007) projects were calmer, tailored to the tastes of the "average" customer, as well as addressed to a wider circle of consumers. Collection spring-summer was also more moderate. These collections were met with increased interest from customers, which resulted in an increase in sales. It can therefore be concluded that the error has been fixed. The company in the framework of strategy to respond to the crisis situation has adopted the rebuild strategy, involving the public recognition of their wines as well as taking up corrective measures.

6 Conclusions

The effects of the damages to reputation depend on two main issues: the source of risk (type of reputation risk) determining the scale and depth of crisis as well as the speed and effectiveness of corrective actions taken by a company, and so the crisis response strategy. Crisis at a moderate level which is the source of human errors (operational risk) may, paradoxically, have a positive influence on reputation and even strengthen it in the future, an example of which are presented companies: Wawel, Bank Pekao Group, LPP Group. It should be noted, that each of these companies has applied the appropriate strategy or several strategies response to the crisis.

Presented examples suggest that tarnished reputation, as a result of a crisis, is possible to rebuild in a relatively short period of time. So reputation turns out not so sensitive resource, as it might seem. However, in order to verify this claim it should be carried out broader research taking into consideration variety of industries, economies, cultures, size and scale of business operations

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Primary Paper Section: A

Secondary Paper Section: AE

HUMAN RESOURCE MANAGEMENT DEVELOPMENT AT LATVIAN CUSTOMS ADMINISTRATION

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Abstract: Paper is devoted to one of the topical questions of modern public administration - development of the competence approach to human resources management for Latvian State Revenue Service, focusing on the development of proposals for customs units to improve the performance. Previous research on the link between HRM and performance has focused almost exclusively on HR strategies and policies and has neglected process and implementation. This paper presents some evidence to show that HRM and process management interaction is important also for tax and customs authorities. The study led to the establishment concept proposals for improvement of the competence model for the integrated tax and customs authorities.

Keywords: customs administration, human resource management, performance, process management.

1 Introduction

Public organizations are increasingly challenged by ideological and political pressures towards new ways of governance, improved efficiency and customer orientation. One of the examples could be mentioned by Gruening, so-called new public management (NPM) may be viewed as a polysemous concept, inspired by various theoretical perspectives, upon which formal agreement can easily be obtained. Nobody could seriously reject such inspiring ideas as modernity, change, efficiency and improved quality. Also a question of human resource management is operational behavior of public administration. Governmental, public-sector organizations are known to operate differently than private, for-profit organizations. But do sector differences exist at the individual level as well? Most of the single studies found significant individual-level differences between the two sectors, although not always in the expected direction. Detailed comparison of public and private sector approaches is given, for example, by G.Boyne, G.Jenkins and M.Poole, however country specific and organization specific issues still are actual research topic. One of the topical questions of modern public administration theories is to ensure that governmental institutions are acting with higher productivity and efficiency. Qualitatively different organization of the public administration is required and since human capital is the main resource of public administration development of the competence approach to human resources management has become popular in recent years, because of its ability to provide qualitative change in all government performance. Despite the fact that gradually competence approach in public administration is planned in an integrated HR (Human Resources) management processes such as planning and selection of personnel, development of job descriptions, wage-setting, career planning and development in the paper Latvian State Revenue Service (SRS) operational behavior is analyzed, focusing on the development of proposals for customs to improve the performance. Certainly is that "the contemporary architecture of company processes allows more flexibility, however it is more demanding with respect to knowledge potential and empowerment of employees. However it remains extremely important how to grasp the formulated strategy, how to distribute it and integrate into company processes and how to ensure their synergies within the framework of existing managerial competencies." As for public administration in the Baltic States, the civil service system is constructed in accordance with the career model, which does not promote the development of career civil servants, as the training and development processes are not regulated and functionally linked to the assessment process. Therefore, improvement instruments are used eclectically, focusing on the areas financed by the European Union, or training does not take place, explaining it by a difficult budget situation. Most strategy formation and realization methodologies are designed for the prediction of the future of business organizations and determination of possible changes. It was established that after the implementation of business process

management, the aspects of quality assurance have changed in the most beneficial way, and the most insignificant changes have happened in the expenses area. To carry out the delegated functions (use obtained funds and assets effectively) in the modern economy, it is necessary to become an institution performing in market conditions, and the recipient of its services becomes a client. This directs the public sector towards modernization and innovations. Performance planning and evaluation are associated with all human resource management processes in the institution, where evaluating the professional qualifications and competencies, the results of the selection process are examined and information is acquired for planning training and development. Moreover, the performance evaluation forms the basis for the claims under the current structure and its detection algorithm. The author believes that to date a uniform system has not been established, within which human resource management processes, such as selection, appraisal, training and planning should be subordinated to each other. Tax and customs administration is very specific and important part of public administration. First of all the reason is a purpose of tax and customs authorities – ensure fiscal needs and ensure economic security of state. Secondly the business philosophy of tax and customs administrations represents very complex environment in which tax and customs authorities works. A single, uniform approach for tax and customs operational behavior is impossible since a great diversity of legislation and individual situations are admitted. Hence as for tax and customs authorities service driven attitude, supported by customer management on the one hand and by human resource management on the other hand is advisable. Like all tax and customs administrations also Latvian State Revenue service is working on management improvement issues reflecting main task execution principles and approaches.

2 Particular features of employee performance appraisal in the Latvia State Revenue Service

The most valuable asset of any public organization is its staff. For any organization's management it is essential to know the quality of the employees, as the results of performance of each organization, both qualitative and quantitative, depend on it. Characteristics of the current staff composition can be provided by an objective and scientifically sound assessment of employees. Public administration has started the development of a common methodology in human resource management, as many of the State Public Service documents, produced by officials, are out-of-date. Thus, the institutional managers at all levels, will be able to build a common understanding of the significance of human resources in reaching the institutional aims, in the selection of new employees, in the retention of the existing staff, and in the objective appraisal of the staff performance and motivation. The primary objective of the performance planning and appraisal is to improve the results of the performance of the institution, which is achieved by assessing the results of the individual performance, and by reaching an agreement on the objectives to be achieved during the next period, thus ensuring that employees can work in the desired direction and quality, required by the institution. The deficiencies, which were observed in performing the work, namely, the unobtainable goals, qualification gaps referring to knowledge, skills and abilities, or gaps in competency behavior and actions which do not satisfy the requirements, were analysed.

Lack of a common methodology in human resource management, analyzing the performance of the State Revenue Service (SRS), where the initial staff performance assessment was delegated to the SRS regional customs offices, so that even within a single institution, unified official evaluation procedure does not exist. The assessment showed that only professional and general knowledge of customs officers, rather than the results of performance and contribution was evaluated. The aim of human resources assessment of an institution is to ascertain

the quality of staff composition, its full potential, the degree of readiness for operational duties. One of the most significant objectives of the performance and assessment system should be promotion of the performance results appropriate to the strategy of the institution, where the most essential element is the evaluation of the subject, the evaluation of the object, assessment and the evaluation methods and procedures. The results of the evaluation can form the basis for calculating the need for additional staff, planning the need for training, addressing the issue of interchangeability of personnel and deciding the issue of staff remuneration. On November 1, 2012, regulations No. 494 of the Cabinet of Ministers, from 10 July, 2012, came into force, namely, "Regulation on performance appraisal system in direct state administrative institutions", which is based on the competence approach. Performance of work will continue to be based on individual performance and overall work efficiency in public administration, as well as the evaluation process, using information technology capabilities. The State Revenue Service is directly subordinate to the Minister of Finance, and, therefore, it is an institution, to which the regulation No.494 of the Cabinet of Ministers applies.

According to Grote, performance planning and evaluation of the annual cycle of State Civil Service Administration is based on four main steps - performance planning, performance of work, performance evaluation and negotiations. Performance planning means an agreement on the objectives to be achieved. During

planning the performance of work, the individual objectives and their achievement indicators shall be set, i.e., the specific results to be achieved. The goal shall be formulated, so as to be understood, by specifying, what needs to be done and what the end result is. The statement of purpose is examined according to the SMART principle, which helps to assess, whether the goal is correctly formulated. However, it does not help to distinguish, whether it is appropriate to the strategy of the institution or not. Performance criteria – achievement of individual goals, fulfillment of the required job responsibilities. The immediate supervisor evaluates the employee performance. The employee himself does not evaluate his own performance, however, shall comment on each of the performance criteria, justifying and explaining how his work done complies with requirements of the position.

Performance criteria are divided into two components: - achievement of the individual goals, i.e., compliance of the employee's individual achievement of results against the pre-defined performance indicators. The target reference point of achieving the individual goals is the pre-defined performance targets and their results, comparing the expected performance level with the current level; - performance of the job duties, i.e., duties meet the eligibility requirements set out in the job description and quality criteria. (see Fig.1).

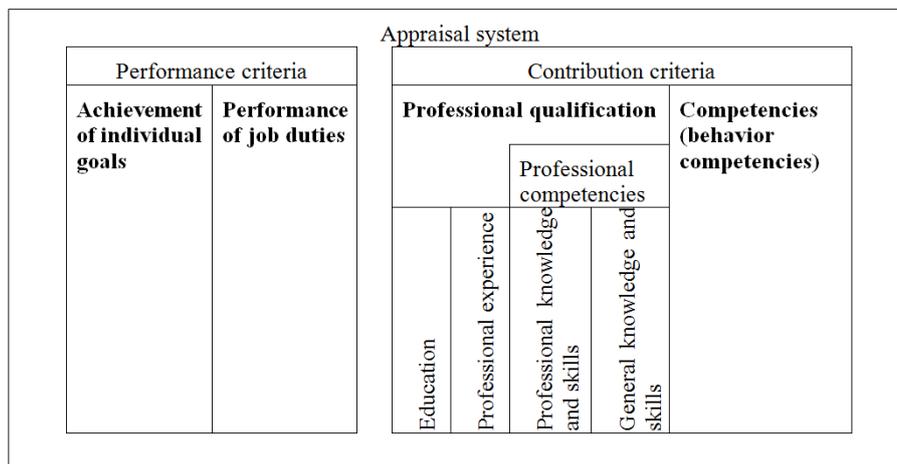


Figure 1: Model of appraisal in State Civil Service Administration [compiled by the author]

The author believes that the resultant criterion is the fulfillment of obligations and duties arising out of job descriptions, for which, in turn, the SRS process is taken as the basis. Thus, being aware of all the tasks of the organization, we can accurately determine criteria of each employee's responsibilities. Contribution criteria - knowledge and skills, qualifications and competencies are needed to be able to perform the job duties, as required, which, in turn, are divided into professional and behavior parts according to the requirements. Competencies are one of the human resource management tools that in the descriptions explain what behavior is expected. The description of competencies is an assistant driver for the manager and the employee. An important component of the description of competencies is the definition and action indicators, which specify how competencies are explained and understood in public administration. The titles of critical competencies for the particular position must be clearly identified in the job description, but a detailed description of the definitions of competencies and action indicators are shown in the Competency dictionary. Competency profiles are designed so, as to inform employees of the rating levels of the appropriate actions during the performance process. They are indicative, and depending on the scope, there may be variations. This means that the manager, when explaining the requirements to the employee

in the specific areas of competencies, can interpret them, taking into consideration the specific position. However, it is essential that this interpretation is previously known and understood. The term "position group" is referred to a set of positions that share similar responsibilities and role in the institution, along with the required competencies. Position groups are performers of support functions, performers of physical and skilled jobs, policy implementers, policy planners, managers, and their division into groups. Competency models have been established for position groups. However, from the author's point of view, the competency models cannot be applied in the same way for different groups of positions. They shall be applied, taking into consideration each specific job description, as, for example, customs officers of the post office of SRS Customs administration in the same position fulfill different roles. As other sub-criteria should be professional qualification – acquired professional qualification of the employee, namely, the compliance of the level of education, professional experience, professional knowledge and skills, general knowledge and skills with the requirements written down in the job description. The professional qualification requirements of the position are outlined in several sections of the job description. The author's point of view is that, so far, this performance evaluation phase has not been developed adequately. An issue, to be considered

is, whether the relevant professional qualification shall be examined together with the changes in the job description of duties. In case, serious changes are envisaged, the employee with inadequate professional knowledge and skills shall not occupy the position. If in the job description changes are planned, the employee shall be trained before the implementation of these changes, or another employee with the appropriate qualifications shall be found. Though, theoretically, there may be a situation, where, for almost a year, in case of major changes in the job description, the employees without adequate professional knowledge and skills can still occupy their position. Latvian legislation provides very broad interpretation about formal education, required for the position in the SRS. There is no corresponding link between the education and the professional knowledge and skills. Professional experience for the corresponding position is a very subjective factor, and there is no direct connection between professional experience and the specialty, and professional knowledge and skills.

3 Job competency model for state revenue service

Choosing the direction, to achieve significantly higher efficiency and effectiveness, with the aim to develop a qualitatively different and targeted system of values in the internal organization, we have to look for a new, unifying, strategy driven solution. The competency approach to human resources management offers such solution, which, in recent years, has become increasingly popular in the world and also in Latvia, because of its ability to provide qualitative changes in the state administrative performance. In contrast to the traditional personnel management, the competency approach is not oriented on defining the formalized tasks and jobs, but instead of that, on how employees fulfill their responsibilities, use their skills and behave, i.e., everything an individual does, to achieve the objectives set successfully. Analyzing the content of competencies, author can conclude that general and functional competencies, are similar in their content and describe the behavior of employees in the work environment, and may be called behavioral competencies, whereas, the specific competencies describe the content of professional knowledge and skill requirements. In fact, they are the so-called "technical" or "professional" competencies, which characterize certain professions or profession groups. Thus, to a greater extent, they correspond to the characteristics of professional qualification. The concept of 'competency', in both cases, can lead to confusion about the nature of the concept and contribute to the misinterpretation in the job descriptions and the competency models. In order to distinguish between the behavioral and professional competencies, in the analysis of Competency handbook, it is recommended to use different terms to designate them, e.g., "competency", when speaking about the behavioral competencies and "professional skills and knowledge", when speaking about the specific or technical competencies and to separate in job descriptions the behavioral competencies and professional skills and knowledge, taking into account the fact, that they are produced and manifest themselves differently, and in the overall performance assessment their relative importance can be different.

Despite the fact that the State Administration is gradually planning to apply the competency approach in integrated human resource management processes, such as staff scheduling and selection, job description development, remuneration, career planning and development, the author has now addressed this issue and wishes to make a number of proposals to improve the professional standards and job descriptions.

The job descriptions provide information about the specific position tasks, performance criteria, circumstances and conditions. The job descriptions for employees, working in the public sector, are made up of two parts, namely, the job descriptions, specifying the corresponding tasks, and the requirements of professional qualifications needed for individuals, in order to occupy the position, so that they would

be able and ready to fulfill the specific work assignments. Traditionally, to specify the requirements of professional qualification, job description analysis should be carried out, during which similar tasks are grouped, and the necessary knowledge and skills to fulfill them are defined. The scheme to develop professional standards is similar, taking into account the rules approved by the Cabinet of Ministers. For quality assurance and evaluation in vocational education institutions, one of the criteria for the evaluation is the compliance of theoretical and practical studies, included in the vocational education programs, and the compliance of content of placements to the profession, i.e., the professional standard. Detailed analysis of the role of professional standards for customs authorities is given by Krastins A.V. Within the framework of one profession, the professional standard includes the necessary information about the requirements of the labor market, acting as a tool through which the labour market can sum up the total and specific requirements for a group of employees and in a concentrated form transfer it to the educators. However, as a rule, in job descriptions the professional qualification requirements are not recognized as the necessary professional knowledge and skills, but simply describe the professional qualification, required for the position, which is the evaluation of a given profession with an appropriate education and professional background, confirmed by documentary evidence. The author considers that, in the SRS job descriptions, section "Duties for the position" is described, in great detail, while the professional qualification requirements are presented in section "Education required for the position of the civil servant", job performance skills are reflected in section "Professional experience and skills required to occupy the position", but the necessary knowledge and competencies required for the position are not at all mentioned. In the SRS job descriptions section "Education required to fulfill the duties of civil servant" according to Latvian laws and regulations provides extensive educational opportunities for the State Revenue Service officials and candidates for the position of civil servants - higher education. According to the law, section „Education required fulfilling the duties of civil servant" also presents the interpretation of education requirements. For example, in the job description of the senior customs officer of the State Revenue Service Customs Administration, it is written down that the first level professional higher education or second level professional higher education, or the second level professional higher education (bachelor's degree), or academic higher education (bachelor's degree), preferably in social sciences, business, law, or in tax or customs administration are required. In the section „Duties for the position" only the specific tasks, meant for the customs service, are mentioned, such as, to carry out physical customs control, or customs procedure with economic impact and customs clearance operation. The author thinks that the exact wording of this section includes inappropriate qualification requirements for the position. The author is convinced by recruiting the people with no special knowledge and skills in the customs field, the organizations must additionally invest in training. This is not required if the people with special customs education are recruited for the position. In addition, the human resources issues, in any public institution, seem to be "most sensitive", and may lead to nepotism. In the job descriptions for customs officers, when defining the knowledge and skills required, emphasis should be placed not only on the professional qualification requirements, but also the knowledge and skills required for each position, on the basis of the job description for fulfilling the duties of a civil servant, not forgetting about the behavioral competencies. In terms of specific competencies that describe the content of professional knowledge and skill requirements, it is essential to divide the general and specific knowledge and skills, so that they are not to be confused with behavioral competencies that describe the behaviors of employees in job situations, and are divided into general and functional competencies. According to this division, the author offers to create more detailed job descriptions and professional standards (see Fig.2.).

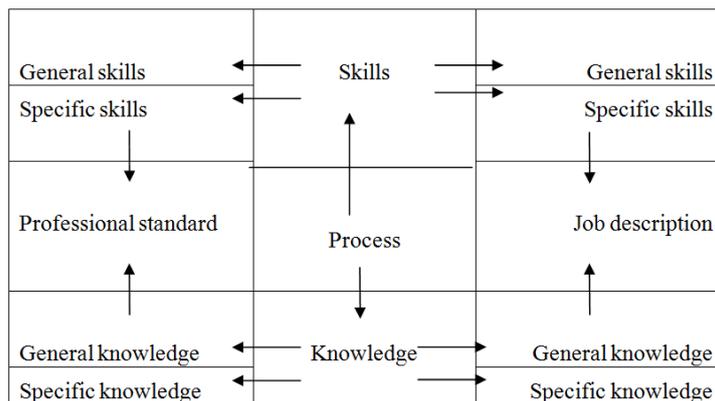


Figure 2. Principle for developing job descriptions and professional standards [compiled by the author]

Therefore, the author believes that it would be proper to make a decision about the division of knowledge and skills at an early stage of process management level, rather than, as usual, when analyzing the job descriptions and, on the basis of this, formulate the necessary knowledge and skills. For training providers, the development of professional standards ensures the possibility to act according to the needs of Tax and Customs Administration, as the future employer, which arises from the goals and objectives of the employer. Exactly in the same way, as the job descriptions are made according to the goals and objectives of the employer, in professional standards and job descriptions the section "Duties for the position" should be included. Thus, the author does not see any problems, when defining the responsibilities in both documents. The same applies to the sections "knowledge" and "skills". The professional standard should be a flexible document, reacting to the changes, in case the job descriptions are changed. As soon as the section "Duties for the position" is changed in the professional standard, or in any of the job descriptions for customs officers, changes in the section "knowledge" and "skills" of the professional standards and also corresponding job descriptions for customs officers should be introduced. This might be the mechanism, how to find the employees, who need new "knowledge" and "skills" to perform their direct duties effectively. As soon as the section "Duties for the position" is changed in the professional standard, or in any of the job descriptions for customs officers, changes in the section "knowledge" and "skills" of the professional standards and also corresponding job descriptions for customs officers should be introduced. It would also serve as an indicator for deciding, what kind of specialist is needed for the position, e.g., a person with knowledge and skills in customs affairs, or a person from another profession. In such knowledge and skills division, the winner would be the organization, which would have the documentary evidence to form the basis for an effective personnel policy planning and recruitment strategy. Main gains obtained are selection of the staff based not only on the education and the qualification requirements included in the job description, but also on knowledge and skills needed for the position, successful development policy and development of a unified knowledge and skills validation procedure. Thus, there will be arrangements through which it would be possible to find the compliance of the knowledge and skills required with the 'fixed' standard both in training and annual assessment. The author concludes that by aligning two documents, namely, the professional standard and the content of job descriptions, it is possible to create a common professional training and skills development system, which would be feasible and suit the interests of both tax and customs administration and employees. Besides, the general and professional knowledge and skills would be the relevant elements of all human resource management processes. Traditionally, job descriptions are based on carrying out tasks in specific working fields or areas of attention, however possible approach would be to concentrate descriptions on roles and areas of the result, with the related

knowledge and expertise aspects. In the relation to this system of competence management system of integration of job patterns could be introduced. Such approach allows staff members do not just focus on their ability to perform properly in their current positions but also work on the development of skills and capacities required to adapt to the increasing task load and responsibilities of the tax and customs administration and the competences needed to address such challenges.

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Primary Paper Section: A

Secondary Paper Section: AE

MARKETING COMMUNICATION TRENDS IN HIGHER EDUCATION ENVIRONMENT

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The contribution was created within project SVV 2014 /OP 7427/: Modern tools of marketing communication on the Internet and their perception of the Czech Internet users

Post in the introductory chapter defines the parties involved in communication of university in its internal and external environment. It urges to new trends (content, mobile marketing, social media, mobile-friendly solution, inbound marketing, real time bidding), which, when it is properly used, can help to create a positive image of school in the eyes of the wide public, these trends are the carriers of competitive advantage, tool for building loyalty of employees, students, graduates, sponsors, employers, etc. Graphic image of the perception of advertising by potential students and the following verbal comment affirm the need of using new trends for the visibility of school and getting the attention of the Internet generation X, Y, Z.

KEY WORDS: marketing, university, segmentation, generation X, Y, Z, trends of marketing communication.

1 Basis for marketing communication of the higher education in institution

Marketing is a scientific discipline that is developing very dynamically. Any school that wants to be successful and competitive must produce quality marketing activities and manage the marketing mix instruments. Marketing communication – as a tactical tool – ensures a presentation of a product or service to existing and potential customers, in case of university also for its graduates, professionals and the general public. It includes all support processes through which are existing and future customers informed and which influence their shopping habits – thus explaining the reasons why they should study at the particular school and what added value they obtain after graduation. Suitably chosen instrument of communication mix will affect the building of trust and loyalty and creation of long-term relationships with other interested parties. Through marketing communication the school tries to influence the knowledge, attitudes and needs of the customers in relation to the offered product (education, skills, abilities) or service. The school must recognize the importance of two-way communication in relation to its own employees, the media, government and financial institutions, suppliers and cooperating entities. One of the goals of communication is to make the whole society perceive school positively, including its activities and products. Suitably chosen communication is an accelerating and regulating factor between the supply and demand.

The new trends in marketing communication include content marketing, viral marketing, event marketing, emotional marketing, mobile marketing, product placement, internet marketing and much more. Online marketing is gaining on the importance with the development of modern technologies and scope and accessibility of the Internet. The modern trend of marketers is to use psychological effects to influence the purchasing behavior and customers' choice, offer unique competitive advantages and recommendations of satisfied customers that encourage them to purchase products. All these tools can be used in school communication practice.

Thanks to hypercompetition (even in the university environment) it is not easy to create original and effective marketing or to design effective and creative communication campaigns. Marketing communication is the most visible part of marketing. The addressees are becoming more demanding, more educated and more immune to traditional marketing tools. "Meeting of the traditional and the new is something which is very typical for the world of marketing communication. It seems that this world has to constantly come up with something new because the traditional is no more attractive, does not address

anyone and therefore will not be effective."¹ Standard marketing tools today cease to be enough, so there is a search for new effective forms of marketing management. New trends may increase the effectiveness of addressing, attractiveness and also can reduce marketing costs. Schools try to attract attention through these trends in marketing communication.

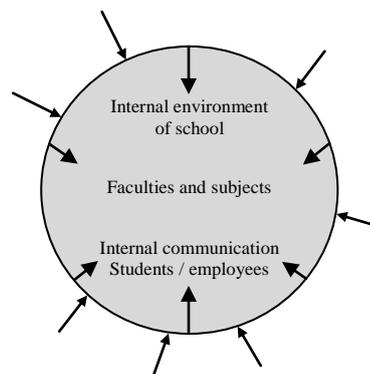
1.1 Customer segmentation of university

"Academic premises are free premises. Soil guarantees freedom of research and knowledge that have not only a rational, but also an ethical dimension, morality and conscience which are shared by independent community of teachers and students – magistrorum et scholarium. This liberal academic premises are not there on a whim of university's representatives, but for the actual fulfillment of its responsibilities for research and teaching."²

Internal academic environment is characterized by factors that create the organization itself. It is the quality of employees and academic staff, students, physical environment, organizational structure, quality and capabilities of academic administration, interpersonal relations between university staff and also between staff and students, and last but not least the organizational culture. One of the most important components of the internal academic environment are people, their skills, knowledge, expertise and education, their achievements, satisfaction with the work environment and the ability to communicate.

Academic microenvironment consists of entities that are not part of the university, but interact with school and influence each other. Usually these are the representatives of the target groups, which for some reason want or need to work with the university. These are students and university graduates, its employees, Ministry of Education, sponsors, partner and competing schools, secondary schools as a potential supplier, cooperating businesses and professionals as well as general public. Microenvironment entities constitute of representatives of the external target groups for the communication of higher education institutions.

Pic. 1.1: Internal target groups in an academic environment

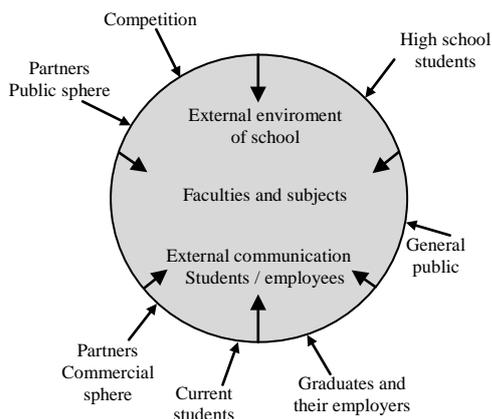


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¹ BAČUVČÍK, Radim. *Tradiční a nové v marketingové komunikaci*. 1. vyd. Zlín: Verbum, 2011. ISBN 978-808-7500-040. p. 7.

² HAMPL, Václav a Jan HÁLA. *Závěrečné komuniké z konference „Historie, současný stav a perspektivy univerzit“* in AULA, časopis pro vysokoškolskou a vědní politiku, 2008, ročník 16, č. 1, CSVŠ ISBN 1210-6658, p. 67.

Pic. 1.2: External target groups in an academic environment



Source: SOUKALOVÁ, Radomila. *Současná role komunikace vysoké školy s cílovými skupinami*. 1. edition. Zlín: Verbum, 2012. ISBN 978-80-87500-14-9. p. 25.

Identification of target groups and their properties for communication purposes of higher education institutions is usually based on socio-demographic characteristics like age, gender, place of residence, type of high school, relationship with an institution, expected benefits.

For more detailed specification of potential and existing students (full and part-time study) it is necessary to deal with the characteristics of each generation, known under the name of generations – X, Y, Z, silent generation. This is simplified in Table 1.1.

Tab. 1.1: What distinguishes generations?

Generation Y 1980 – 1996	Generation X 1965 – 1979	Generation of babyboom 1946 – 1964	Silent generation 1928 – 1945
Use of technology (24 %)	Use of technology (12 %)	Work ethic (17 %)	II. World War / economic crisis (14 %)
Music culture (11 %)	Work ethic (11 %)	Tolerance (14 %)	Intelligence (13 %)
Liberality / tolerance (7 %)	Conservatism (7 %)	Values / morality (8 %)	Probity (12 %)
Intelligence (6 %)	Intelligence (6 %)	„Baby boom“ (6 %)	Work ethic (10 %)
Clothes (5 %)	Tolerance (5 %)	Intelligence (5 %)	Values / morality (10 %)

Source: BERGH, Joeri van den, BEHER, Mattias. *Jak cool značky zůstávají hot: marketing zaměřený na mladou „generaci Y“*. 1. edition. Brno: Bizbooks, 2012. ISBN 978-80-265-0002-5. p. 23.

While the majority of teachers and school staff could be included in the silent generation, baby boom generation, generation X, the majority of students belong to the generation Y. Generation Y is said to be a generation of the cyber revolution. Digital progress and the ability to connect from anywhere changes social DNA the same way the industrial revolution transformed the culture and lifestyle of the late 19th century. Thanks to the digital media, today's 13 – 25 years old people form their own world through cell phones, internet, tablets and music players. To obtain a unique competitive advantage in their eyes, the school should be aware of their differences and focus marketing activities of schools on their lifestyle. This generation is also referred to as the turn of the millennium generation, also generation Why, Next Generation, Search Generation, digital natives, Echo Boomers and the like. The Generation Y is the successor of the Generation X. Views of children of this generation have weight and parents take them into account when

discussing things. Young people have the opportunity to travel, play sports and learn new things. They are critical, cynical and well-known for the fact that it is quite complicated to amaze them. It is hard for them to resist the need for immediate gratification and they can maintain attention for a short period of time. They want to implement their ideas immediately. It is on marketers to take advantage of this valuable information in their strategies and successfully hit this large group. The next succeeding generation is generation Z – those born after 1996, today's preschoolers, elementary school students and future students at higher education institutions. Larry Rosen has marked them in his book *Rewired: Understanding the iGeneration and the Way They Learn* as an iGeneration. The prefix i – "I" means to edit and customize everything according to your needs. For them it is quite common to use the internet and mobile devices on a daily basis. For them, technology is not a tool but part of life. In connection with the characteristics of each generation it is often discussed whether its members are not only in a stage of life or if their opinions or way of thinking will change through time. The clear answer is no! "Generation is a product of the time and of course, technology, media, social indicators and events that make it uniquely shaped. Values, attitudes and priorities that were set at a young age will remain unchanged for the rest of their life."³

The above text implies that the use of new marketing trends is necessary for a successful communication with existing and potential students. Some of them will be presented in the following text.

2 Marketing trends in higher education environment

2.1 Content marketing

As a result of the hyper competition, the importance of interesting and creative communication is significantly growing. The user brings a new quality. According to the Content Marketing Institute, content marketing is basically an art of communication with supporters and customers when the company does not try to sell anything. Sam Decker states that content marketing is not product-focused, but rather informative, enlightening, entertaining, etc. By publishing this type of content, schools attract the attention of interested parties but at the same time they have to focus on the topics of cognitively connected with their offers and demonstrate audience their expertise. The definition of the website Copyblogger is "Doing content marketing is to create a free and regular extra quality content that your audience will share and find it useful or funny. Quality content will attract some people who may find your content interesting and, eventually, they can become your customers. And if the processes are set well and customers are satisfied, the customers will become returning customers. Because you publish quality educational content, the customers will believe you, like you and it will make them want to do business with you."⁴

The main aim of the content strategy, as well as of the marketing, is to satisfy the customer (or Internet users). First, it is necessary to determine their wishes and needs and then satisfy them through the content that you deliver. Since the main objective of the content strategy (as well as other online marketing tools in most cases) is to maximize the number of relevant visitors on school's website, social networks, blogs and forums. First of all it is necessary to know what people are looking for, what they want, what issues are troubling them, to which questions they would like to know the answer. After learning these facts, the information is deployed on the specific medium and channel through which the company's communication will be brought to the internet end user. The mix (concrete channels and media) is filled with information and its

³ BERGH, Joeri van den a Mattias, BEHRER. *Jak cool značky zůstávají hot: marketing zaměřený na mladou „generaci Y“*. 1. vyd. Brno: BizBooks, 2012. ISBN 978-80-265-0002-5. p. 21 – 24.

⁴ PROCHÁZKA, Tomáš. [online] *Co je obsahový marketing a proč ho používat*. [cit. 2014-04-05]. Available at: <http://www.vceliste.cz/co-to-je-obsahovy-marketing/>

content is continuously published on the basis of precise schedule. Since each target group responds differently to different media types and uses different channels for receiving information, it is not possible to create a mix which would be successful across all segments. Online content strategy consists of the following parts:

- Media – these can be articles, applications, dictionary, text post, photos, status on Facebook, forum post, video, e-book, events, infographics or other graphics and more. An example in the higher education institutions environment may be a video recorded by the VŠFS multimedia center. It is a short film presenting successful graduates. It introduces the five former students who were able to exploit the potential of education and achieved extraordinary results in their professions. Video can be published on the school website, at Gaudeamus exhibition, on the social network YouTube, it can be part of a school presentation at the Open Day, etc.
- Channels – individual channels are web, blog, Facebook page, YouTube channel, Twitter account, Foursquare account, a discussion forum, specialized magazine, conference proceedings, PPC advertising, as well as personal communication in the context of official and unofficial school activities (soccer tournament for Rector's cup, school ball, press conference for prof. Klaus', etc.)
- Content – it is a text, photographs, videos, competitions, quizzes, e-learning and the like. An example is the content of the new website www.ematurity.cz through which VŠFS provides potential students – present high school graduates – with video simulations of oral final examinations presented in an entertaining way in the sections Czech with Švejk, English with Harry, mathematics with Albert.
- Schedule – it is a document that contains a particular form of tasks, including data publication, an article, specialized magazine and number of views. An example might be an article published by doc. Milan Kašík in the magazine *Marketing & Media* on the 3rd of March 2014. The school promotes the development of practical skills and it has set up an advertising agency for the students.

An integral part of every content strategy is key performance indicators (KPI)⁵ which measure the performance and success of activities.

2.2 Social media

The website mediaguru.cz defines social networks as a "special group of Internet services that enable mutual virtual-social connection of people on the Internet, communication and social activities. Major social networks include Facebook, LinkedIn or Twitter. However, there may be other networks such as Groupon (collective shopping) Delicious (bookmarks manager) and others.⁶ Social networks fall into the category of Web 2.0. They exist because users make their contents. "Their fundamental essence is something more – creation of virtual relations between users. Those networks contain functions for sending messages similar to e-mails, for direct communication (ICQ, Skype) and the basic method of communication is sharing."⁷

It is necessary to monitor and evaluate results of school's activities on social networks for long periods. Nevertheless, the social networks have now become a tool for personal recommendations. Up to 80 % of social networking visitors search for recommendations/opinions on the brand or company and make a decision based on their findings. Grant Leboff describes in the book *Sticky Marketing* the importance of social networks as follows. "It is a specific kind of platforms where the

conversation will take place and where you can find people who want to influence you. You cannot expect these people just come to you by themselves. To get their attention and to establish the initial contact you have to be present in places they often visit."⁸

2.3 Visual content of the message

What does it mean? Visual information include the source of information in the form of visual media such as static pictures, presentations, photos, videos, some digital stories in the form of audio recordings and more. All this in order to facilitate memorization and efficiency when getting attention. Well-known data prove why is the visual content of the school presentation important. Textual content, even if it is interesting, may not attract you so much. 90 % of information that the human brain holds is of visual nature. This content is also easier to remember by up to 65 %. The school attracts people with bold colors and creative graphics and addressees of the statement get a clear message. 40 % of people rather respond to a visual signal rather than to its textual variant.

In connection with this topic, the creation of messages should respect the trend in the provision of information by using infographics. Data say that creating good infographics can increase website traffic by up to 12 %. Video content is another very visible pillar of this trend – 85 % of all videos are viewed online. Website Design is for 46 % of people the first criterion when assessing the credibility of the company. A potential customer is more likely (around 85 %) to become a real customer (student at the school) after watching the video demonstration of the product along with virtual tour around the school and with the presentation of sample lessons.⁹

2.4 Mobile-friendly solutions

Content adjusted to mobile devices such as tablets and mobile phones is gaining on importance. Smart phones and tablets are one of the most popular devices among the students and interested parties. Mobile-friendly content is adapted to be read even in those mentioned facilities. It keeps the original text and graphics. The only difference is that it is adapted to another resolution. Not only websites should adapt their content to different devices. Also e-mail marketing requires mobile-friendly content. More and more people are accessing the internet via mobile devices and e-mail communication (and search) is among the most frequent activities.¹⁰ Web access is changing in favor of mobile media. For illustrative clarity see Table 1.2.

Tab 1.2: The proportion of devices through which users access the internet. Comparison of the first quarters of 2012 and 2013.

Device/ Period	Q1 2012	Q1 2013
Traditional	88,62 %	78,99 %
Tablet	5,95 %	10,58 %
Smartphone	5,42 %	10,44 %

Source: Smartinsights [online]. Statistics on mobile usage and adoption to inform your mobile marketing strategy. © Smart Insights (Marketing Intelligence) Ltd. [cit. 2014-04-05]. Available from: <http://www.smartinsights.com/mobile-marketing/mobile-marketing-analytics/mobile-marketing-statistics>

2.5 Inbound marketing

What is inbound marketing? Roughly one can say that it is about how to be the center of attention when you are talking about any topic. Future customer gets to the website of the company practicing inbound marketing through compelling content that

⁸ LEBOFF, Grant. *Sticky marketing: jak zaujmout, získat a udržet si zákazníky*. 1. vyd. Praha: Management Press, 2011, ISBN 978-80-7261-235-2, p. 124.

⁹ HubSpot [online]. *Fascinating Statistics That Make the Case for Using Visual Content in Your Marketing*. [cit. 2014-04-05]. Available from: <http://blog.hubspot.com/blog/tabid/6307/bid/33423/19-Reasons-You-Should-Include-Visual-Content-in-Your-Marketing-Data.aspx>

¹⁰ Sdružení pro internetovou reklamu. [online]. *TZ Internet je využíván jako komunikační nástroj, zdroj informací a zábavy*. Copyright © 2011 SPIR z. s. p. o. [cit. 2014-04-02]. Available at: <http://www.spir.cz/tz-internet-je-vyuzivan-jako-komunikacni-nastroj-zdroj-informaci-zabavy>

⁵ KPI – key performance indicators that are used to measure the performance of certain activities. In the online environment are known CTR, web traffic, number of subscribers, the number of fans, etc.

⁶ MEDIAGURU [online]. *Sociální sítě (definice)*. Copyright © 2013 PHD, a.s., [cit. 2014-04-05]. Available from: <http://www.mediaguru.cz/medialni-slovník/sociální-sítě-social-media/>

⁷ BEDNÁŘ, Vojtěch. *Internetová publicistika*. 1. vyd. Praha: Grada Publishing, a.s., 2011. ISBN 978-80-247-3452-1, p. 193.

attracts his attention. The aim is to make people demand school's products or services, contribute to a positive image, build loyalty. It involves countless tools and activities which include SEO, e-mailing, PR releases, podcasts, forums, creation of backlinks (called Link-building), blogs, videos, social networking and more. Unique content and appropriate distribution can result in the desired effect (see section 1.2 Content marketing). You need to know your product well and be clear about what you want to offer to interested parties. Offer quality of teaching and practical application to the students, graduates that are prepared for jobs to the employees, and professional development to the staff, etc. In the context of content creation and its deployment across the web we will probably encounter some "blind shots" (one type of content will be less effective than the other). However, activities cleverly set within content marketing can save us a lot of effort and money that can be spent elsewhere. The aim, of course, is to convert users into customers and we need to focus on this aim. Numbers cannot be avoided even here. As in other activities, we cannot do without measurement and analysis. For the full image, we have to mention other specific activities within inbound marketing. These include uploading of useful articles on blogs (preferably from prominent figures in the field, the so called influencers). It is also appropriate to upload an article that leverages our product and discusses the reasons why to buy it into the respected online magazines. It is not just about PR articles, the content can also be a video, the interviews with celebrities, infographics. Specifically, for example, the daily newspapers E15, March 13th, 2014, Petr Budinský: The quality of teaching is also provided by the real life experts; Ekonom, February 20th, 2014, Jaroslav Vostatek: Four ways where you can go, iDnes.cz, February 7th 2014 Czech teachers favour girls. A new study opposes feminists. Petr Matějů, Dean FSS VŠFS.

2.6 Real-time bidding (RTB)

It is a technology that makes it possible to buy banner ads more effectively through auctions. Compared to the traditional purchase of banner advertising as we have known so far, the real-time bidding (RTB) offers more effective and faster execution of campaigns, and what is more important, advertising can be focused specifically on the selected user. In practice it means that the site visitor upon entering website is displayed a particular advertisement, which is determined by the interaction with the web presentation or advertising based on his interests. So, it is not a pig in a poke, but a very well-targeted advertising with a lower number of impressions (ad views) for favorable prices. The following text zooms closer at the real functioning in practice.

In the world of RTB, there exist two sides (platforms) among which the auction takes place in real time. As in the economy, we have the supply side and the demand side. The media (SSP, Supply-side platform) and then the advertisers (DSP, Demand-side platform). It is important to note that not every advertising space is available via RTB. However, if a user comes to the area available via RTB, after he loads the page, the real time auction takes place between the SSP and the DSP. There the publisher (medium) sells impressions that he could not sell in a classic sales (not in RTB). Subsequently, the advertiser is selected (by several factors) and the banner is then displayed to the user. The advertiser buys an audience through DSP platform (it is important to have collected or purchased data). It is important to note that using this form, the advertiser buys the audience, not the space. For example, in the USA transactions through RTB account to around 10 %. In the next few years it is expected to increase to 25 %.¹¹

The advantage of using Real-time bidding is reduction of costs for advertising, more accurate (and specific) audience, transparent menus, the representative of the school sees all

campaigns in one system, faster start-up campaigns, opportunity to reach previously targeted users (retargeting) and others. For this system there are several different platforms such as Double Click Bid Manager or AdForm.

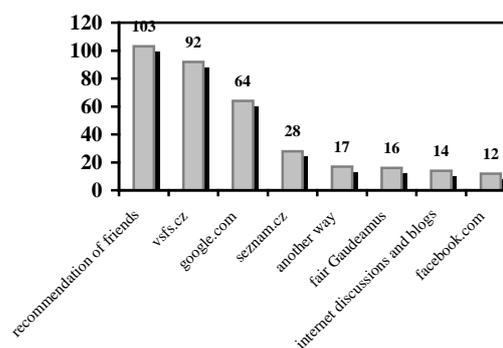
We could go on, naming many new trends. What does it mean for everyday communication activities of higher education institutions? We recommend to reconsider existing forms of online marketing activities, to determine how existing communication of schools is evaluated by potential and current students, graduates, staff, and other interested person. It is necessary to precisely define the target audience and determine what segment of customers we are trying to reach – and, subsequently, deduce concrete steps for communication campaigns that are suitable for the communication in online and offline environments.

3 How students of VŠFS, o. p. s. perceive its communication

Advertising is one of the essential elements of the communication process of VŠFS, o. p. s. The school uses all elements of communication and media mix – i.e. print and outdoor advertising, radio, television, and online advertising. Its communication strategy involves sales promotion, personal selling, PR, fairs and exhibitions, events, thematic Open days "What it's like to be our student", guerilla campaigns – such as events Do you want to have your own statue? Study! etc.

The chart below is the result of the VŠFS's survey with its prospective students. Questionnaires were distributed at the Open Day and their aim was to determine the primary impulse that brought visitors to VŠFS, o. p. s. and, therefore, where is the most effective place for an ad. The evaluation covers the year 2013 and a total of 407 corresponding prospective students. The graph shows that most participants knew about VŠFS, o. p. s. from friends, parents, colleagues, etc. This indicates the need for continuous building of a positive image in the eyes of the general public and also the need to build brand awareness and to promote achievements of the school. Another source of information is the website of the school, Google, Seznam, Gaudeamus exhibition, online discussions and blogs.

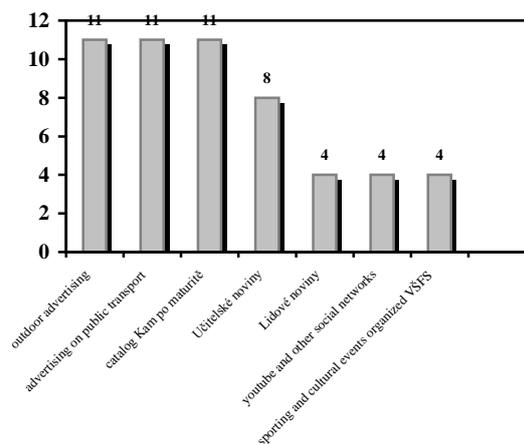
Graf 1.1 Graphical representation of perception advertising VŠFS from part of potential students



Source: internal school material

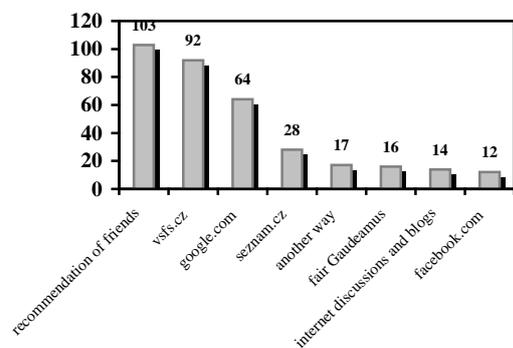
¹¹ Blog.hl. [online]. *Seznamte se s real-time biddingem*. © 2013 H1.cz Ltd. a QUIISMA company. [cit. 2014-04-06]. Available at: <http://blog.hl.cz/aktualne/seznamte-se-s-real-time-biddingem/>

Graf 1.2 Graphical representation of perception advertising VŠFS from part of potential students



Source: internal school material

Graf 1.3 Graphical representation of perception advertising VŠFS from part of potential students



Source: internal school material

It is clear from this graph that school's communication has been correctly focused on online media appealing to the current generation. This confirms the need for the use of new trends in marketing communication. An essential part of marketing activities is to constantly react to changes in key areas following the European higher education institutions settings. Within marketing strategies it is important to focus on creation of values for customers and interested persons, respect individual approaches based on knowledge of their habits, needs, requirements and expectations. Now the current need of the younger generation is the communication on the internet and interesting news communicated through emotional and content marketing.

4 Conclusion

Marketing of higher education institutions is a complex process which management must be based on many factors. These factors are responsible for the content that institutions communicate in different ways to the interested groups. Rapid change of marketing communication tools goes hand in hand with changes in the global economy, information technology, needs, requirements and expectations of customers. As a result of these changes, the marketing must develop and use new ways of addressing customers. The new trends in marketing communication include content marketing, viral marketing, emotional marketing, mobile marketing, product placement, internet marketing along with the use of social networks, remarketing, mobile-friendly solutions, inbound marketing and

many more. Prestige of the school and its success depends on the marketing skills of the school staff.

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Primary Paper Section: A

Secondary Paper Section: D, G, L

DEVELOPMENT OF A RISK CULTURE FRAMEWORK FOR THE FINANCIAL MARKET

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Abstract: Many banks are seriously impacted by the financial crisis. Thus nowadays, they try to establish a sound risk culture. This paper analyzes the diverse risk culture concepts and develops a risk culture framework for the establishment of an adequate risk culture in financial institutions. Therefore, different concepts based on organizational theory, cultural theories as well as other psychological approaches are analyzed in detail. The comparison of the concepts deciphers the same attributes independently of the applied approach designate a sound risk culture.

Keywords: Risk culture, financial market, resource-based view, cultural theory

1 Introduction

As financial companies enter new markets, expand their trade relations and are confronted with increasing pressure from stakeholders to enhance transparency and disclosure, risk management becomes a board-level concern of financial institutions. The financial trade activities have changed. Financial markets deal with the expectation of possible financial streams and monetarized relationships. The fiscal transactions are no longer linked to material counterparts and production life cycles.¹ These developments have altered the focus of risk management from a loss avoidance approach to a key contributor to market advantage via improved corporate reputation and better recognition in the financial market. 30% of the companies in Germany consider the implementation of a sound risk culture as their main challenge.²

The financial crisis started with a sub-prime crisis in the United States. But the sub-prime crisis did not have only an impact on a small segment of sub-prime mortgages, it extended to the entire financial system. The implications of the sub-prime crisis have been a liquidity crunch, a dramatic impairment of credit notes, and finally an economic downturn with the risk of a strong economic recession.³ Thus, the financial crisis, which is originated in the excessive risk-taking in the financial market, has straightened the debate of risk management.⁴ The financial crisis forced the regulators to pass several laws and policies to regulate the risk management of the companies. In the financial sector, the regulatory requirements imposed by BASEL III result in further tightened measures to manage risks. The regulations of BASEL III have been transposed into national law in Germany in 2010. The amendments to pillar two are implemented in the MINIMUM REQUIREMENTS FOR RISK MANAGEMENT (MaRisk). The new compensation rules are enforced via the initiation of the REGULATION GOVERNING REMUNERATION AT INSTITUTIONS.⁵ In addition, 65% of the seriously impacted banks increase their focus on a sound risk culture.⁶ As shown in a research of ASHBY, PALERMO, and POWER the use of the term risk culture is raising from 2007 onwards.⁷

2 Definition of risk and risk culture

In accordance with IDW (Institute of Public Auditors in Germany) and GASB (German Accounting Standard Board) the following definition of risk will be applied in the paper: Risk is the possibility of a future negative impact on the economic position of a group. It is the negative discrepancy between the achieved and the expected result. Risk can but not necessarily has to result in a potential loss. Risk can occur in each organizational unit and is related to all activities of an entity.⁸ The financial sector differentiates between credit risk, market

risk, operational risk and other risks including liquidity risk.⁹ As a result of the financial crisis a new risk category has arisen - systemic risk.¹⁰

Researchers such as BUNGARTZ, O'DONOVAN, as well as the IRM have defined criteria for sound risk culture. According to them an adequate risk culture can be described with the following characteristics: "A company has to possess a high integrity. The organization has to establish clear principles regarding risk management. These guidelines have to be promoted by the executives of the company. The senior management is accountable for the implementation of the risk culture. But each individual employee is responsible for the management of risk. There has to be a risk-awareness throughout the whole company. Risk appropriate behavior has to be encouraged and rewarded. The company has to promote an actively leaning culture to be able to survive by adapting to the new developments in the market."¹¹

3 Overview of the state of research on risk culture

As the following sub-chapter illustrates, research regarding risk culture is a relatively new subject of applied science. The risk culture concepts are based on diverse theories such as organizational culture theory, cultural theory or other psychological approaches. The next section gives an overview of the existing risk culture studies and approaches.

The first risk culture study was accomplished by BOZEMAN and KINGSLEY in 1998. The authors focus on a multivariate measure of risk culture. Their research is based on the definition of risk culture as the willingness to take and manage risk. In their research they try to examine the correlation between risk and the following independent variables: sector, formalism, control, promotion, goal clarity and trust. They analyze risk culture and its corresponding leader-ship behavior via information from the National Administrative Studies Project in 1992. The authors use questionnaire data collected in a two stage sample of 365 top-level and middle-level managers from a variety of public and private organizations in New York. Their core hypothesis is that risk culture will differ between the public and private sector. The findings of BOZEMAN and KINGSLEY are that risk-taking behavior does not depend on the market sector. Most important is goal clarity for risk-taking, whereas red tape and formalism demoralize risk-taking behavior. Moreover, if risk-takers are rewarded, they are better informed and make better decisions. Their research result shows a positive correlation between the willingness of the leaders to trust their coworkers and the willingness of the coworkers to take calculated risk and to act more risk aware.¹²

The second study concentrating on risk and culture was accomplished by VAN VUUREN in the year 2000. He analyzes the cultural influence on risk and risk management. The research focuses on safety culture. The author divides the safety culture into three sub-categories: norms and rules for dealing with risk, safety attitudes, and reflexivity on safety practice. A risk management approach called PRISMA (Prevention and Recovery System for Monitoring and Analysis) is applied as data collection tool. The author uses incident information collected in the Dutch steel industry and medical domain. In the steel industry VAN VUUREN analyzes 78 incidents from two studies. In addition, four case studies in the medical domain are used to extend his research. The study shows that in the steel industry as well as in the medical domain about 30% of accidents are caused by the culture of the organization. Most of these accidents (about 70%) are caused because of the failing attitudes of the involved persons. VAN VUUREN'S conclusion is that the traditional focus

¹ Kessler 2011, p. 198.

² Herre / Tüllner 2011, p. 21.

³ Bessis 2010, p. 3 et seqq.

⁴ Hudson / Maioli 2010, p. 53 et seqq.

⁵ Deutsche Bundesbank 2013.

⁶ Ernst & Young 2012, p. 14.

⁷ Ashby / Palermo / Power 2012, p. 8.

⁸ Denk / Exner-Merkelt 2005, p. 28 et seqq.

⁹ Bank for International Settlement 2005, p. 144.

¹⁰ Bank for International Settlement 2011, p. 1 et seqq.

¹¹ Bungartz 2006, p. 171 et seqq.; O'Donovan 2011, p. 43 et seqq.; 64; AIRMIC / ALARM / IRM 2012, p. 6.

¹² Bozemann / Kingsley 1998, p. 109 et seqq.

on human error and technical crashes needs to be substituted by a method that concentrates on the organizational and cultural aspects of failure. The research shows a high cultural influence on risk behavior and risk management. The study supports the relevance of the topic of this paper.¹³

Other approaches of risk culture are based on the relevant findings of organizational culture especially on the approach of SCHEIN. He is the founder of the modern organizational psychology. He uses in depth analysis of organizational culture to examine the deep roots of organizational culture. In the 1980's he developed a theoretical concept, which findings are used as a core concept for many other culture analyses. Researchers such as BUNGARTZ¹⁴ or FÜHRING¹⁵ apply Schein's findings for their theoretical risk culture models.

BUNGARTZ' theoretical model is based on the approach of "cultural pragmatism", which means that the management of an organization is able to influence the company's culture as well as its risk culture. He develops a three step-model to adjust the risk culture of a company. BUNGARTZ' risk culture concept is based on a variety of diverse recent research findings from risk management and organizational culture.

FÜHRING uses an analytical method to develop a risk culture concept based on secondary research. His conceptual work is based on two dimensions. The first dimension is the degree of adequate risk behavior. The second dimension is the type of risk conviction. Remarkable regarding his concept is that the author does not only focus on the formal and technical aspects of a risk management system. He also considers organizational and psychological aspects. In the focus of his approach is the resource-based management approach. He combines this management approach with organizational theory and develops an optimal risk culture – the "resource-based risk culture". FÜHRING invents a risk culture typology, which is based on two dimensions. The one dimension is the "degree of risk-appropriate behavior" and the other dimension is the type of "risk conviction" of the company. The risk-appropriate behavior depends on the task / position of the employee and the business sector of the company. It should not be unidirectional – not only risk averse or risk affine. The adequate risk behavior depends on the probability of the occurrence of loss and the estimated loss amount. Prerequisites of an appropriate risk behavior are competency, motivation, and organization. Competency encompasses the capability of the employees to be aware of the consequences of their behavior in respect to the specific risk situation. Therefore, the employees need the intellectual, social and methodical skills to be aware of a sound risk behavior. Additionally, the employees have to be motivated to behave in the desired way. The motivation depends on intrinsic elements like morale but can also be influenced by extrinsic elements e.g. the reward of risk-aware behavior by the company. Moreover, the appropriate risk behavior has to be embedded in the organizational structure and procedures. The assignment and extent of responsibilities and accountability have to promote risk-aware behavior. In addition, the compensation and benefit strategy has to facilitate the desired risk attitude. In the second dimension FÜHRING differentiates between two kinds of risk conviction (internal & external). The internal risk conviction is based on proactive behavior. Each employee is certain to be able to influence the development and risk situation of the company. In contrast, if the company has an external risk conviction, the company observes risk as not influenceable. According to the opinion of these entities, the locus of control is embedded in the market. In consideration of the two dimensions, FÜHRING developed four risk typologies. Companies showing a "bureaucratic ignorance" have an internal risk conviction, but do not focus on potential risks. They occupy themselves with their internal processes and are not able to adjust to changing market conditions. The companies do not compass future risks in their

business plans and do not take any countermeasures. Companies possessing a "reactive fatalism" have an external risk conviction and a low degree of appropriate risk behavior. They view market developments as not changeable. Thus, risk can occur or not. These companies only have reactive business continuity plans but do not develop a long-term risk management strategy. The third risk typology is described as "market-oriented risk management culture". The adequate exposure to risk is in the spotlight of the company. Adequate risk behavior will be rewarded. The risk conviction is external and focuses on external influencing variables. Such a risk culture can be observed in a risk management reporting focusing on market or exchange risks. Operational risk caused by the organizational structure and processes are not in the focus of the company. Such a culture promotes behavior patterns and capabilities to adapt promptly to the changing market conditions. The "resource-based risk management culture" is designated by a high degree of risk aware behavior and internal risk conviction. A responsible risk management is a core competency of the organization. FÜHRING defines resource-based risk management "as the entirety of organizational measures for risk identification and dealing with risk of business activities, which comprises a possible loss of the market demanded (core) competencies and the impossibility of the assembly of the respective entity resources". In addition to BARNEY's resource-based concept, FÜHRING considers the organizational structure as a key resource for achieving a competitive advantage. From his point of view, valuable, rare and unique resources only create a competitive advantage if the organizational procedures, structure and culture promote the potential of these key resources.

Another research regarding the relationship between organizational culture and risk management system is done by KIMBROUGH and COMPONATION. They analyze whether it would be preferable to have mechanistic or an organic cultural environment for implementing an enterprise risk management system. Therefore, they use REIGLE'S "Organization Culture Assessment" (OCA), which is based on BURNS' and STALKER'S organic-mechanistic model. Additionally, they develop a risk management instrument to determine the risk management system. The questions of both instruments have been provided to 2000 internal audit executives via online survey. The study analyzes the differences between the implementation of a risk management system in an organic or mechanistic culture. A mechanistic culture possesses a strict hierarchy and according to BURNS and STALKER is favorable in stable conditions. In contrast, an organic culture is appropriate in a fast changing environment. In an organic culture the commitment of the employees is higher than in mechanistic culture. Decisions are made by the most informed and capable person. The research result of KIMBROUGH and COMPONATION is that an organic organizational culture supports the speedy implementation and effectiveness of a risk management system. According to the research five culture elements can be used to define the organizational culture type: language, artifacts and symbols, patterns of behavior, espoused values and beliefs and underlying assumptions. Typical culture elements of organic culture are symbols representing integration and support, continuous job improvement, open-door policy, and employees are observed as important assets. According to the approach, an appropriate risk culture can be defined as an on-going learning culture, which recognizes work accomplishments, values its employees and supports a positive and transparent communication style. In contrast, an inappropriate risk culture risk management is seen as something negative, responsibilities are neglected and the risk management is separated in silos and not regarded as duty of the entire organization. The result is that the more organic the culture, the more progress can be accomplished in implementing a risk management system. Employees working in an organic culture have positive perceptions of the risk management deployment speed and effectiveness. They regard the organizational culture as supportive. Companies, which installed a chief risk officer, are more satisfied regarding the implementation process than the company without such a key figure. These companies sense that the senior management does

¹³ Van Vuuren 2000, p. 31 et seqq.

¹⁴ Bungartz 2006, p. 170 et seqq.

¹⁵ Führung 2009, p. 1 et seqq.

not support the implementation of a risk management system entirely.¹⁶

Prior to the explicit risk culture research and conceptual work, other authors have already generated theoretical models which partly consider the risk culture aspects. Such a framework is conducted by SMALLMAN. He investigates the link between risk management and organizational behavior via case studies. One aspect of his framework is the risk management culture. His conceptual work is based on diverse scientific concepts such as the work of MILES, SNOW, MEYER and COLEMAN. The aim of his work is to provide practitioners a tool for investigating their risk management system. SMALLMAN describes risk culture as the beliefs and values that influence the activities of individuals and groups who are in charge of risk management within the organization. SMALLMAN differentiates between a proactive and a reactive risk culture. In a reactive risk culture, organizations establish business models by experts which exactly define the risk tolerance. These models are converted into guidelines and quantified decision policies. Only well known risks or major threats are considered in the model. The parameters of the model are only changed, if a major unexpected negative event challenges the risk management model assumptions. This management approach is event driven. Therefore, the organization only reacts in accordance to the unexpected incident. The preferred risk management strategies are risk retention (accepting loss) or risk transfer. Both strategies imply a financial loss by accepting the outcomes of unfavorable events or insurance premium payments for transferring the risk. SMALLMAN labels this approach as fatalistic. The second risk management paradigm is driven by a proactive risk culture. In this approach the risk management strategies are driven by potential risks and not by events. Risk avoidance, risk prevention and risk reduction are the applied risk treatment strategies. Organizations with a proactive risk culture consider all risks and their interrelation. The risk culture implies organizational learning from internal and external events as well as framing of possible risk scenarios. By applying a proactive risk management approach organizations pay attention to so-called "weak" signals for example the company's culture itself. According to SMALLMAN, the proactive approach can also be called holistic risk management approach. SMALLMAN combines this approach with the typology of MILES, SNOW, MEYER and COLEMAN. They defined four different types of organization (Defender, Analyzers, Prospector and Reactor) which differ in their business strategy. The Reactor has no consistent strategy, structure, procedures or technology. The authors call this a form of strategic malfunction. According to SMALLMAN, the Reactors' risk culture is fatalistic. They do not look ahead. This group reacts to risk inadequately. Their risk management behavior is contradictory. Defender wants to establish a stable organization and protect its market domain. This organization uses strict control systems to achieve efficiency. It ignores market developments and is unable to adapt to changing market conditions. SMALLMAN states that Defender possess a reactive risk culture. This organization is not able to anticipate hazards. They only focus on known and well-identified risks. Their risk culture is more fatalistic than holistic. The third strategic group is called the Prospectors. They focus on the market environments and adapt to each new trend. The organization is very flexible and the procedures are characterized by a low degree of formalization, decentralized control, high coordination mechanism. The performance is measured against important competitors. They are not efficient in creating long-term commitment. They have a more proactive than reactive approach. They scan the environment regarding any emerging risk and can easily adapt to market changes. Their problem is that they might cause costly failure by disregarding risks due to unstructured or overly complex procedures. The fourth group is called Analyzer. This group tries to minimize the risk by maximizing performance. This organization combines the strengths of the Defender and the Prospector. This group has to establish an equilibrium between flexibility and stability to gain a competitive advantage. Therefore, they often use a matrix

structure. According to SMALLMAN, this type of organization possesses the most proactive risk culture. On the one hand side this institution conducts a broad environmental scan, but its flexibility is balanced off by risk averseness and stable procedures.¹⁷

The conceptual model of Smallman is partly confirmed by the work of MIKES. She has accomplished a field-study and examined the risk management system of two 'leading edge' banks via 75 in-depth interviews from 2001 to 2003. The second source of her information is direct observation of risk management in action. The study explains differences between a risk management by numbers and a holistic risk management. The research is complemented by a second study between 2006 and 2010. In this study, MIKES conducted 53 in-depth interviews at five institutions. In her field study she differentiates between two types of risk cultures. She calls one of the risk culture "quantitative enthusiasm". Risk models are observed as robust and the adequate decision making tool in this culture. They are established by risk-counting experts. Another characteristic is that the organization uses risk-adjusted performance measures to control the risk management activities. But the risk managers do not influence key strategic decisions. They protect themselves by their autonomy and scientific know-how against criticism and blame. This culture has many attributes in common with the reactive risk management culture such as outcome specification, narrow participation, quantificationism or balemism. Two of these banks in MIKES' case study suffered a major loss in the financial crisis. The other calculative culture is called "quantitative skepticism". The members of this risk culture focus on the envisionment of decision-relevant risk and use quantitative as well as qualitative approaches. The risk experts under this culture view themselves as strategic advisors and regularly influence key strategic decisions. The risk culture is forward-looking and anticipates risk management developments. They observe risk figures as trend signals, which they use to learn from. This culture has predominantly the same risk culture attributes as the proactive risk management culture of SMALLMAN such as anticipationism, absolutism, broader participation, complementarism, qualitativism and process specification.¹⁸

Other researchers apply cultural theory to analyze the risk behavior. Cultural theory states, that the view and behavior of an individual is shaped by the social group to which the individual belongs. Thus, attitudes and judgments about risk are formed in accordance to the cultural relationships. Cultural theory examines the social construction of risk.¹⁹

MAINELLI extends the cultural theory approach to the work environment. According to MAINELLI, risk culture is defined by the risk/reward-personalities of the people working in a company. People are the core of all risk/reward decisions. Hence, they determine the decisions of an organization. MAINELLI classifies the risk culture according to the risk behavior of the employees. The approach divides people on the horizontal axis into those who look at collective risk versus those who look at individual risks. The vertical axis represents the view of people regarding equality. At the top of the vertical axis are people following rules, even if unfair. Their life is dominated by a strict hierarchy. On the other side of the vertical axis are people who establish the rules themselves. Thus, four different characteristic risk culture types can be identified: Individualist, Egalitarian, Fatalist, Hierarchist. The findings of MAINELLI are amended by general risk management findings of DAKE, TANSEY and O'RIODRAN regarding the four culture groups. Fatalists view nature as unpredictable. They believe that they cannot influence nature. Thus, they take whatever happens. According to MAINELLI, most of the people belong to this group. In contrast to the other three groups, they can easily be moved to another quadrant. Moving this group is the easiest way to gain support for change.²⁰ According to DAKE, Fatalists are those

¹⁶ Kimborough / Componation 2009, p. 20 et seqq.

¹⁷ Smallman 1996, p. 21.

¹⁸ Mikes 2009, p. 18 et seqq.; Mikes 2011, p. 226 et seqq.

¹⁹ Tansey / O'Riordan 1999, p. 71.

²⁰ Mainelli 2004, p. 345 et seqq.

who cannot compete successfully in the market due to lack of resources or those who observe life as a lottery where no particular risk management might help to master the challenges of the market. The risk management strategy of Fatalists is "Why bother?". In the social relation Fatalists do not encounter the self-regulation pressure from the market. In addition, they do not possess high group solidarity.²¹ From their point of view the complexity is steadily increasing and changes in consideration of risk management are not beneficial. They do not trust anybody else except for themselves.²² In contrast, Individualists observe nature as innocent. They do not care about risk. Only major catastrophes influence their world. They do not consider the consequences of their decisions except for the return of their investments. According to MAINELLI, marketing professionals typically belong to this group.²³ Deregulation is the favored risk management approach of the Individualists. The term deregulation means that they prefer self-regulated networks with little external impact. From the Individualists point of view, everybody can gain so much wealth which will compensate for the taken risks, if no artificial market constraints exist. They favor individual risk management decisions instead of collective control.²⁴ Egalitarians view nature as transient. They are afraid that their world can be destroyed. They are the most active group. They desire risk management rules and regulations. They want to know who bears the risks if anything goes wrong. According to their self-conception, a company needs them to understand the risk the company faces.²⁵ They challenge top down risk management approaches and hierarchical risk management framework. They demand risk strategies that foster equality of outcomes. Their risk management issues are related to social and political dimensions. The group criticizes organizations responsible for risk management.²⁶ Egalitarians demand a structural change of the way the society deals with risks. The change should be enforced by democratic processes and public participation.²⁷ The fourth group contains the Hierarchists. They observe nature as stubborn. Their goal is to manage nature. Their system is stable under normal conditions. But extreme situations due to catastrophes destroy their designed world. Hierarchists are seen as power brokers. They are a natural bureaucrat and prefer decisions based on sound-thinking. They are in conflict with the risk management rules established by the Egalitarians. According to MAINELLI, they are the only type who values a cost/benefit analysis. Thus, they acknowledge the marketing concepts of the Individualists. MAINELLI believes that most of the finance directors belong to this group.²⁸ In accordance to DAKE, the risk strategy of hierarchical groups is formed by experts. Only they have the knowledge to develop strategies in accordance to the given boundaries. The commands of the experts are followed by the others of the group. There is a high compliance to risk management regulations in this group.²⁹ According to the hierarchical group, an on-going learning culture based on trial and errors as well as a transparent and fluent risk communication are crucial characteristics of an effective risk management system.³⁰

According to ADAMS, these four risk perceptions are the reason why no common risk communication and behavior exists. Enterprises are led by entrepreneurs who belong to the group of Individualists. They focus more on the reward of risk than on the damage it may cause. Hierarchists try to balance the cost and benefits of risky business. Egalitarians complain about the profit-seeking activities of the entrepreneurs and the failure of the Hierarchists to protect them. On the contrary, the group of Individualists complains that Hierarchists over-regulate the

business tasks. The rest of the society represents the Fatalists who do not care about risk management at all.³¹

In contrast to the above mentioned researchers, MARS invents an approach which analyzes the risk management behavior based on the organizational structure of jobs and not from the perception point of view of the diverse groups. His opinion is that if he can identify how a job is organized, he can determine how workers execute risk management tasks. Therefore, he also applies the cultural theory concept and the two social dimensions. He labels them as the degree of classificatory constraints and degree of incorporation (grid dimension). He analyzes whether the employees face high or low autonomy and work in tight bounded groups or isolated (group dimension). This distinction leads to four different organized work clusters: Individualism, Fatalism, Enclave, Hierarchy. The group of Individualists has a high degree of autonomy and works in loose group relations (low group strength and low constraints). The group consists of highly skilled and independent professionals. A lack of organizational procedures and guidelines exists. The group dislikes critics and does not accept any control mechanism neither from their supervisor nor workmates. The Individualists have a short-term perspective and do not possess a long-term loyalty to any specific employer. They prefer short-term personal advantage over long-term corporate success. They belong to a cosmopolitan network and do not feel aligned to their local job environment. The communication in such a job organization is informal and individualized. Ad hoc solutions are often applied. The job environment allows them to cheat on time and to break rules. The group owns a high risk appetite. Jobs in the category of Fatalism are marked by a low autonomy and a high isolation (low group strength – high constraints). Typically, these jobs are embossed by high routine tasks according to fixed timetables in specific environments. These jobs are characterized by a high employee turnover, high absenteeism and sickness rate. The isolation and lack of group control can have a negative impact towards the employees work attitude. These jobs are endangering negligence of risk management and facing a high potential for sabotage. Jobs which are determined by high group strength and high constraints are called Hierarchists. This group of employees works in diverse job areas, which complement each other to accomplish a larger overall task. The jobs are classified by expertise, seniority and / or job specialty. This group owns a strong sense of group identification and controls its members. Breaking group norms is sanctioned. The group focuses on long-term success and calls attention to strategy. The jobs are distinguished by strong control mechanism and well-established processes. Their risk management system is endangered by their slow adoption to a fast changing environment and their over-confidence in their procedures and information system. According to Mars, the fourth group is called "Enclaves" and shows high group strengths but low constraints. The group is formed of same skill / same specialty workers such as a maintenance pointer team. The compensation system is similar for the whole group. They have the same supervisor. In this group many conflicts arise due to undirected competition. Alliances and pacts are used to negotiate and arbitrate problems. The group is very unstable and rejects authority.³²

4 Development of a risk culture model for the financial market

Although MARS uses a different point of origin for his cluster the results and categorization of the habits of the work groups are very similar to the other researchers mentioned above. In consideration of the research, the two job organizations who try to manage risk are the Individualists and the Hierarchists. While the Individualists prefer ad hoc solutions and show high risk preference, the Hierarchists are more long-term focused and favor well implemented structures. An ideal structure would be a hierarchic structure for the successful implementation of a long-term risk management strategy. Additionally, the organization

²¹ Dake 1992, p. 29 et seq.

²² Tansey / O Riordan 1999, p. 86.

²³ Mainelli 2004, p. 345 et seqq.

²⁴ Dake 1992, p. 29.

²⁵ Mainelli 2004, p. 345 et seqq.

²⁶ Dake 1992, p. 29.

²⁷ Tansey / O Riordan 1999, p. 87.

²⁸ Mainelli 2004, p. 345 et seqq.

²⁹ Dake 1992, p. 28 et seq.

³⁰ Tansey / O Riordan 1999, p. 86.

³¹ Adams 2009, p. 7 et seqq.

³² Mars 1996, p. 10 et seq.

should integrate a small number of Individualists. The function of these high professional experts is to observe the market environment for changes and to challenge the existing risk management structure. They could give hindsight to protect the company and its resources from any new risk arising. These hints can be used by Hierarchists to make a cost/ benefit analysis and to gain a sustainable competitive advantage.

By comparing the risk management approach based on cultural theory and the resource-based risk management approach, it is in evidence that these two approaches originate from different points of view. Cultural norms are in the focus of cultural theory, which form the risk perception of the group. This risk perception leads to diverse risk behavior and risk management strategies. In contrast, the behavior of the organizations is in the focus of the resource-based risk management approach. From this behavior, FÜHRING deduces different risk management strategies and risk perceptions. Thus, these theories have a contrary point of origin. But, both theories define four groups and some of the groups are identical regarding their risk perception and behavior. Both theories have identified a group called "Fatalist". This group is reactive and does not believe that they can influence their environment. Thus, they do not establish a risk management system. In addition, the Individualists exhibit a very similar behavior as the organizations applying a bureaucratic ignorance. In both theories these groups do not care about external risk. They are occupied with their own rules and regulations. From these findings, it can be reasoned that groups with an individual orientation possess a less risk aware behavior. A reason for the behavior might be that individual oriented groups do not look at the whole picture. They just focus on themselves. In contrast to the before mentioned groups, a clear mapping of the two other groups is not possible. The Egalitarians do not fit into the concept of FÜHRING. Possible institutions which fit to this role are organizations, which want to apply rules to protect a fair market and to establish equilibrium in the market such as banking supervision or shareholder organizations. The group of Hierarchists wants to manage risk. Like market-oriented or resource-based institutions they have a high risk awareness.

According to OSTRANDER, organizations based on a hierarchical system can be identified by five tendencies:

- 1) They view society as part of nature.
- 2) Hierarchical relationships are valued positively.
- 3) Routine symbolic actions are embedded in the company.
- 4) Group-oriented goals of symbolic action are deeply rooted.
- 5) The company possesses a highly elaborated symbolic system.³³

Thus, Hierarchists have implemented many risk artifacts in their organizations like companies with a market-oriented or resource-based approach. A differentiation between external or internal risk convictions is not applied in the risk management approach of cultural theory. Concluding, the risk management approach of cultural theory and the approach of FÜHRING complement each other.

The risk management dilemma can also be transferred to organizations especially banks. The board, CRO and risk management department take the role of the Hierarchists, the sales and trade department or shareholder act like the Individualists and the audit department, union or other stakeholders like minor shareholder alliance behave like Egalitarians.

Additionally, the proactive and reactive risk culture respectively the "Defender" or "Analyzer" possess similar attributes as the groups clustered in cultural theory or in the resource-based view. The characteristics of the "Analyzers" are very similar to the risk culture of Hierarchists. Both groups value a cost / benefit analysis and want to maximize profits by minimizing risks. Like the resource-based culture the proactive risk culture possesses a holistic risk management and a future-oriented time horizon. They believe, that they can influence and change the risk position of a company. Therefore, they implement an open communication and on-going learning environment.

Contrariwise, "Defenders" or reactive risk culture groups are very similar in their behavioral pattern to groups possessing a bureaucratic ignorance. They perform reactively and are too occupied with their established procedures. Thus, they do not have an adequate risk-awareness. They are not able to identify emerging risk early and cannot adapt to major changes fast enough.

Moreover, business units according to the tentative risk culture model and the approach of SMALLMAN can be compared. Too risk adverse business units act like "Defenders" whereas too risky business units act like "Prospectors". The business units which operate in accordance to their risk appetite in consideration of the bandwidth model act like "Analyzers". They show the adequate risk culture according to the definition of O'DONOVAN or BUNGARTZ.

Moreover, the research of MIKES has shown that a reactive approach can lead to problems in fast changing environments. According to the description of MIKES, reactive banks can be classified as Defender. The proactive banks can be defined as Analyzer. On the one hand side they always challenge the strategic decision, but on the other hand side they use the environmental scan only as an indicator of a change and do not take the results for granted. In addition to MIKES' research, the concept of FÜHRING builds a supporting framework for the analysis and establishment of a strong risk culture. As mentioned before, the core functionality of a resource-based risk management is to implement a risk culture which supports adequate treatment of risk. If a new risk emerges, financial institutions applying a "resource-based risk management approach" will have a competitive advantage. Due to their well implemented risk instruments, their perfect organizational structure, the fast information flow and their competent and motivated staff, the companies are able to react as one of the first companies in the market. They can use the first mover advantage to take appropriate action prior to all other market players. Thus, the bank will face no or only a minor loss.

According to the findings above, it is obvious that the results of the different risk culture concepts do not vary significantly. Even if the points of origin and applied theoretical concepts vary, all of them differentiate between a more proactive, sound, and risk aware culture in contrast to an inadequate risk culture characterized by reactivity or too risky and selfish behavior. For the analytic research of risk cultures of financial institutions especially the frameworks based on organizational theory have to be considered. These approaches embody an appropriate frame of reference to develop a risk culture concept for banks.

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³³ Ostrander, 1982, p. 14 et seqq.

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Primary Paper Section: A

Secondary Paper Section: AE, AH, AO

SOURCES OF REPUTATION CRISIS AND POSSIBILITIES OF ITS MANAGEMENT

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Abstract: Reputation is a very valuable, strategic resource of a contemporary company. It is a prized but simultaneously highly vulnerable, corporate asset and at the same time one of the most difficult to protect. No company is able to protect itself from committing some errors and avoiding the risk of reputation loss or damage. Although it is not possible to eliminate reputation risk, it is possible to limit the probability of a crisis and the influence of its effects. It requires monitoring and control of the factors as well as the sources of risk and protection of procedures and tools which could be launched immediately after occurrence of an undesirable event. So this is what the management of reputation risk is about. As an example companies that identified the sources and was able to deal with the reputation's crisis is Toyota.

Keywords: corporate reputation, stakeholders, reputation risk, crisis management.

1 Introduction

Reputation is considered to be one of the most valuable resources of a modern company. It is classified as an intangible resource, included in marketing resources of relational nature [Hooley, Saunders, Piercy, 1998; Srivastava, Shervani, Fahey, 1998]. Reputation has a nature of strategic resource because according to the conception of resource school, it belongs to the resources which are valuable, rare and impossible to imitate [Barney, 1991; Grant, 1991; Hall, 1993]. Strong, positive reputation, carefully sustained and nurtured can be the source of a long-term competitive advantage of the company [see: Szwajca, 2012].

Difficulty or relative impossibility to manage reputation results from its complex and specific nature. J. Low, and P. Kalafut notice that reputation is the ultimate intangible, it is slippery, volatile, easily compromised, amorphous and impossible to control [Low, Kalafut, 2002]. But some authors claims, that we should rather talk about management of reputation risk.

This paper has a number of objectives:

- to realize the role of corporate reputation, as a significant marketing resource in today's competitive arena, and to indicate how difficult it is to manage this resource,
- to present identification of possible reputational risk sources, with particular attention to predictable and unpredictable sources,
- to describe the possible approaches to reputation risk,
- to present a case study of a company that identified the source and was able to deal with the crisis reputation.

2 Is it possible to manage corporate reputation?

In general, reputation can be defined as an opinion functioning on the market about the company and its activities expressed by different groups of interest (so-called stakeholders) who had any kind of contact with this company or heard about it. Corporate reputation is also defined as:

the "observers" collective judgments of a corporation based on the assessment of the financial, social and environmental impacts attributed to the corporation over time [Barnett, Jermier, Lafferty, 2006],

the perception of a corporation by the public (including corporation's various stakeholders such as suppliers, customers, employees, local communities etc.) and is a function of certain events exposing corporate identity features (such as business practice, behavioral incident or characteristics of the sold products) that were previously unknown to the public [Tonello, 2007].

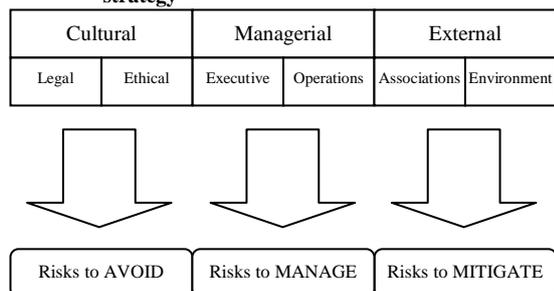
Good reputation is the source of numerous benefits: it builds and enforces customers' loyalty, it allows to gain the best employees, attracts attractive investors, facilitates establishing relationships with the best suppliers and contractors [Walker, 2010; Obloj, Obloj, 2006; Eccles, Newquist, Schatz, 2007; Rayner 2003]. These benefits can be translated into measurable results in the form of increased sales, lower marketing costs, lower capital costs, higher profits and higher growth potential. It is reflected in financial results and market value of a company [Roberts, Dowling, 2002; Fombrun, van Riel, 2004]. B. Lev estimates that corporate reputation can comprise more than 60 per cent of a company's value [Lev, 2001]. Wang and Smith found that having a higher reputation on average increases the company's value by about \$1.3 billion [Wang, Smith, 2008]. Institutions and agencies dealing with the measurement of reputation (e.g. Reputation Institute, Harris Interactive, Fortune) proved that there is a strong positive correlation between the Reputation Quotient and market value of a company. For instance, according to the research of the Reputation Institute a positive 1-point increase in the Reputation Quotient was associated with higher average market values of about \$147 million, while a 1-point decrease was associated with market values lower by about \$5 billion. These results suggest that a "value spiral" operates according to the rule that better-regarded companies attract more investors who build up their market value and further improve their reputation [Fombrun, Foss, 2001].

Reputation is a valuable resource contributing to the company's value but at the same time it is very sensitive, prone to injuries and difficult to protect. It takes a lot of time to build it but it can be lost at once. W. Buffet said that: "It takes 20 years to build a reputation and five minutes to ruin it." Firestein said that today a risk to its reputation is a threat to the survival of the enterprise [Firestein, 2006]. Of course not every mistake or crisis in a company results in complete loss of reputation and leads to its collapse. In most of the cases reputation is damaged or impaired but it can be rebuilt. However, it turns out that it is a very difficult challenge for the companies. It may be costly and extremely lengthy.

In connection to the fact that reputation is a very complex, sensitive and difficult to control resource, a question arises whether it can be effectively managed [Szwajca, 2011]. Some authors suggest that we should rather talk about management of reputation risk, understood as a gap between the expectations of stakeholders and company's operations [Ross, 2005; Honey, Brady, 2007; Tonello, 2007; Honey, 2009]. However, according to Eccles, Newquist and Schatz most of the companies do not manage reputation risk because managers do not know how to define and measure it. In practice their operations come down to liquidation or mitigation of the negative results of the crisis which surprised them suddenly. It is not risk management but crisis management [Eccles, Newquist, Schatz, 2007]. Although it is not possible to eliminate reputation risk, it is possible to limit the probability of a crisis and the influence of its effects. It requires monitoring and control of the factors as well as the sources of risk and protection of procedures and tools which could be launched immediately after occurrence of an undesirable event. So this is what the management of reputation risk is about.

3 Sources of reputation risk and management strategies

The causes of situations leading to damages or loss of reputation can be located inside or outside of the company. Internal causes are connected with behaviors and decisions of the employees at the different levels of organizational structure – from a regular employee to the chief executive manager. External causes are objective in nature and do not completely depend on will and human activities. Honey and Brady classified the sources of reputation into three groups, indicating appropriate operational strategy for each of them (figure 1).

Figure 1. Sources of reputation risk and management strategy

Source: Own work based on: Honey G. (2009), *A short Guide to Reputation Risk*. Gower Publishing Limited, England-USA, p. 24.

Cultural risk is rooted in organizational culture of a company, therefore it refers to adherence to codes and standards of conduct, procedures and rules of operation, valued merits, customs and traditions. Cultural risk embraces legal and ethical risk. In case of legal risk the rules and regulations of conduct are imposed by external institutions (central and local administrative authorities, tax offices, supervision committees etc.) – failure to adhere to these rules results in rigidly defined legal sanctions. It is the most dangerous type of risk which in most of the cases leads to the collapse of a company. The best known examples are here Enron and Arthur Anderson [see: *Najgorsze strategie i praktyki zarządzania*, 2008].

In reference to ethical risk, rules are established and adopted voluntarily by an organization or discreetly imposed by various opinion forming environments (e.g. social organizations, business associations, research centers, mass media). Ethical risk reflects discrepancy between this what an organization says and what it actually does. A good example here can be promises made in advertisements which are not kept or ethically controversial advertisement. Since the sources of cultural risk are relatively easy to identify, the company may apply towards them the strategy of avoidance.

Management risk refers to the sphere of decision-making and performing tasks by all employees of a company – from the highest to the lowest level. Management risk referring to the decisions made at the highest level are reflected in the results of a company as a whole (level of profit, stock rate, shares in the market etc.). These are usually wrong strategic or investment decisions, resulting from the lack of competence or arrogance of the executives. Operational risk in turn, is a consequence of mistakes or negligence of the executives at the lower levels or direct contactors. Their mistakes in most of the cases lead to the defects of a product, mistakes in documents or faults in service etc. It is possible to mention here such examples as: J&J's Tylenol – a painkiller intoxicated by cyanide, faulty Firestone tires, defect of Pentium chip by Intel Corporation [see: Hartley, 2004; Krawiec, 2009]. The sources of management risk can be identified and controlled that is why the best strategy is the management of risk. Companies use different tools in the form of early warning system, controlling or procedures of internal audits. However, they do not give any guarantee to avoid this risk since none of the procedures can protect against human error.

Determinants of cultural and management risk are placed inside an organization. There are also some which are in its environment. These are external factors which can be divided into two groups: relational and environmental. The first group of factors is connected with the fact that a company uses outsourcing, cooperates with different entities on the market: suppliers, intermediaries, cooperators etc. Mistakes and errors committed by them (e.g. supply of faulty raw material or component, delay in delivery by external haulage contractor, loss of an invoice) indirectly charge the company because it made a wrong choice, maybe it did not sufficiently verify or checked a potential partner. These factors generate relational

risk. The second group of the causes of external risk is located in natural, demographic, technological and competitive environment of a company. These causes are the source of environmental risk. Such events as: fire of the storehouse, computer virus, emergence of dangerous competitor cannot be predicted or effectively protected. The causes of external risk can neither be controlled nor avoided. The only solution is to reduce or mitigate the results of undesirable phenomena.

4 Toyota – defects in cars

Toyota is one of the most recognizable and best-selling brands of cars in the world. Since 2007 Toyota constantly occupies the first position as regards the most valuable car brand in the world. In the same year it won the title of the biggest manufacturer of cars in the world, taking it after 76 years from American General Motors.

Toyota Motor Company builds its reputation on the basis of high quality and reliability of its products. Such attitude is the foundation of the company's organizational culture which is based on continuous improvement of the quality of production, identification of the areas that can be improved as well as introduction of necessary improvements at the beginning of each new project. However, despite huge efforts connected to building of corporate image as the manufacturer of the highest quality cars, Toyota until the year 2009 underwent several crises related to reputation.

The first crisis appeared in November 2009 and referred to the detection of technical defects in certain models produced between the years 2005 and 2009. The problem referred exactly to the blocking gas pedal in eight models of cars. Recall, carried out at the expense of the group, was to correct the floor-mat attachment and possibly adjust its position so it could not interfere with the gas pedal. Another defect was also connected to a gas pedal that became stuck leading to unintended acceleration. In January 2010 it turned out that the cars equipped with defective parts in American factories were also sold in Europe.

In February 2010 another defect related to the functioning of brakes appeared. This time recall referred to over 400 thousand hybrid cars [B. Niedziński, 10th February 2010]. The cause of faulty brake system was in electronics which required reprogramming during the recall campaign. Delay in braking process resulting from faulty brake system constituted a serious threat to the health and life of the drivers as well as the passengers of these cars. Until today no one knows how many people died because of this defect. Toyota admitted to five but American authorities have spoken about 18. There were at least 2 thousand accidents caused by this defect in the United States alone where the problem was revealed at the earliest.

These events seriously damaged Toyota's corporate reputation because the company reacted too slowly to the problems that came into light in its cars. The first defects appeared in November 2009 but 3 months had passed before the company informed its customers about it.

After this issue was reported, the first reaction was an apology of Toyota's president during Economic Forum in Davos where he publicly claimed responsibility for the defects in the cars and spoke about people who lost their lives in consequence of these defects. In February 2010, first in the newspapers in the USA and then in Europe, information appeared about defective cars as well as a full page apology advertisement and information about recall action. Apart from service recall of 8.5 million vehicles, Toyota also made a dramatic decision to suspend production and sales for a week in order to repair the cars at different dealers as well as to collect sufficient number of faulty components. As a result, in February 2010 the company sold 9% cars less in the USA than a year earlier whereas the competitors experienced increased turnover. Moreover, a debate raged in the United States whether Japanese cars were still safe which led to the hearing of Akio Toyoda (the president of Toyota) in the United States Congress where under oath

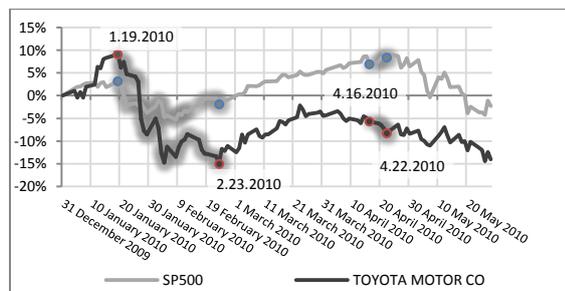
he was answering to Congressmen's questions. The president of a Japanese company admitted that initially his company downplayed the reports that in some models of Toyota gas pedal was blocking. American authorities received reports about 34 possible victims of fatal accidents caused by unintended acceleration problems.

As a result of these events Toyota lost not only in terms of its corporate image, which it had been diligently building over the years, but also in financial terms. It is estimated that corrective actions cost about \$2 billion and included about 12 million cars [B. Niedziński, 10th February, 2010]. The effect was a considerable drop in quotes which from 21st January, when the first information about hidden defects in Japanese cars appeared, to March 2010 caused that the market value fell by \$31 billion.

The management of Toyota, in an attempt to rebuild corporate reputation, took up various steps such as an apology visit of the Toyota's president in Georgetown where the biggest factory of this brand in the USA is located, issuing information about potential threat to safety in certain models on the company's website, making a promise to install a mechanism that would eliminate the risk of a sudden acceleration in all new models of the cars.

The above mentioned steps taken to stop the crisis of reputation show that Toyota felt guilty and did not try to avoid the problem and, on the contrary, it made a step to its customers, trying to provide them with the best service and help. What is more, the company had to pay a record-high penalty (\$32.4 million) for breaking safety rules because it did not inform about technical problems with its cars [D. Walewska, 22nd December 2010]. Toyota's activities, even though together with a further disclosure of information in the media about car defects company's shares on NYSE were marked down more than the index of broad market (S&P500), they were still positively assessed by shareholders which at the end of February led to the return to correlation [Fan, Geddes, Flory, 2013]

Figure 2. Changes of stock quotes of Toyota Motor Company and the S&P500 index on NYSE on a cumulative basis before and after a crisis event (date of reference: 31st December 2009).



Source: Own work on the basis of quotes data from www.yahoo.finance.com

Unfortunately for Toyota, information about the defects in its cars which were revealed in the period of January-February were not the only ones in 2010. On 19th April 2010 this Japanese company, after a headline "Don't buy. Dangerous" appeared in a "Consumer Reports" magazine [A. Kublik, 15th April 2010], announced that it suspended worldwide sales of the new off-road Lexus GX 460 and, moreover, it would suspend for 9 days production of this car. It also promised to conduct car safety tests in all models. Toyota's problems, apart from financial ones, were also related to questioning of Lexus safety – a luxury Japanese brand which for years had been considered to be the highest quality standard in automotive industry. It should be noted that these events negatively influenced Toyota's stock quotes on NYSE (figure 2) but because of the preventive measures that were quickly taken up, the time of this influence was much shorter than in case of crisis situation from the beginning of 2010.

Toyota, after a lesson from the beginning of 2010, adopted the policy to care about corporate reputation which was connected to issuing information about the defects in cars as soon as it was possible and taking up corrective actions [D. Walewska, D. Woźniak, 27th February 2011]. After the crisis at the turn of 2009/2010, further communicates about Toyota's recall were associated with its concern about the quality of produced cars as well as corporate reputation. Crisis which affected the company in 2010 had a nature of operational risk at a fairly high level (safety and even users' lives were put at risk). Corrective actions were not standard – in fact, no action was taken immediately after the crisis. Only after numerous complaints, motions to courts and popularization of the topic by the press which attracted attention of government administration in the USA, the company finally decided to take up corrective actions. It was then that the company decided to take steps to rebuild its reputation. Thus, proper management of situational crisis makes customers are willing to forget and forgive [Coombs, 2007; Hunter, Menestrel, de Bettignies, 2008; Carroll, 2009].

5 Conclusions

Reputation risk is inherent in the activities of each and every company. Acceptance of this fact is the first step in the process of risk management. The second step is activation of the early warning system which means tools and procedures to monitor potential sources and causes of risk. It primarily refers to managerial and cultural risk because the causes of environmental risk are more difficult to predict. The third step is to develop a program and the team (of procedures and people) to carry out corrective actions which can be activated immediately after crisis occurrence in order to reduce its negative consequences.

Deep crises are those which sources are cultural causes, especially legal but also ethical. They cause more severe not only financial but mainly image losses. Rebuilding of such reputation is here more difficult and lasts much longer. In extreme cases it is impossible to repair and ends with the collapse of a company. A good example here is Toyota whose actions after the crisis were not immediate but they were effective in the long term.

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Primary Paper Section: A

Secondary Paper Section: AE

THE CONCEPT OF HOLISTIC COMPETENCE OF MANAGERS IN THE TENDERING PROCESS IN SMALL AND MEDIUM-SIZED ENTERPRISES IN THE CZECH REPUBLIC

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Abstract The success of any organization depends on many factors. One of the most important factors are undoubtedly human resources and human capital. This paper deals with the holistic competences of the employees who were recruited to the position of managers mainly in the category of small and medium-sized enterprises (SMEs). The main aim was to determine and compare the level of holistic competence during the selection of recruits to managerial positions in small and medium-sized enterprises and in large enterprises. Data were collected through a questionnaire survey in enterprises executing their activities in the territory of the Czech Republic. The research results confirm the authors' assumptions that the selection of the employees at the managerial positions is assessed in their holistic competence to a greater extent in large enterprises than in small and medium-sized enterprises..

Keywords: Small and Medium Enterprises (SME), Holistic Management, Competence, Tendering Process, Human Resources Management (HRM).

1 Theoretical background

Small and medium-sized enterprises (SMEs) are defined in the laws of the Czech Republic and the European Union. There are two key factors to determine whether the company belongs to a group of SMEs: the number of employees and the annual turnover or the annual balance sheet.

Small businesses have by these determinants 10 to 49 employees and an annual turnover or balance sheet in the amount of 50 million EUR. Medium-sized enterprises have 50-250 employees and 50 million turnover and 43 million total assets.

Personnel strategy by Armstrong (1999) is supposed to help the organization to achieve its goals, react to any change in a complex organization strategy, connect external influences and their effects on the internal specifics of the organization. The HR strategy is consequently based on personnel policy, which presents the concept of basic rules for its own implementation of specific practices of personnel management and human resources management in the organization. Kociánová (2012) Many businesses from the category of small and medium enterprises (SMEs) have not created any personnel strategy. The tendering processes especially for management positions should therefore be an integral part of their personnel policy, hence the HR strategy and strategy of each company. Their progress, evaluation and impact on the running of the company are still areas, which are underestimated by the management representatives of small (usually the owner) and medium-sized enterprises (owners, HR). The consequences of improperly performed and underestimated conditions by managers might just be completely destructive for this category of businesses. The literature offers a large number of best methods and perspectives of many renowned authors, mostly from the ranks of managers, psychologists and sociologists. However not all methods and techniques are appropriate or suitable for the use in a production environment of SMEs.

The method of recruiting employees generally includes the method of examination of the documentation and the method of a personal interview, which are typical and widely used in the business practice of MSP. Large and multinational companies approach the selection of its managers with a higher responsibility and they use more sophisticated methods, such as testing methods of employment eligibility, methods of making or using existing competency models, Assessment Centers, model Competing Values Framework (Quinn, 2003; Govender and Parumasur, 2010), model High Performance Managerial Competencies (Schroder, 1989) or Holistic model of Competence (Porvazník, 2011). The disadvantages of such approaches for representatives of SMEs can be described as an excessive specificity (for example, competency models, which had been created before, when the number of required specific

person manager and their ability to select the key competencies that characterize and make speeches about a particular behavior), time (eg, creation of own competency model) or financial requirements (for example, in the case of the use of Assessment Centre). (Kubeš, Spillerová, Kurnický, 2004).

Among the current trends in human resource management of the third millennium we can classify, according to Kociánová (2012), holistic management, age management, talent management and CSR - Corporate Social Responsibility. CSR of the organization is made up of four pillars - economic, legislative, ethical and charitable. Additionally, the last mentioned method of selecting managers - The Method of Porvazník's holistic model of competence - based not only on the principles of holistic management, but it also corresponds with the principles and fundamental pillars which a socially responsible organization stands on.

The Model of holistic competence (capability) of managers is very comprehensive, as it presents a comprehensive view of any entity of management, not just the managers, but any individual, team or company. It is based on a holistic management, which is set on system sciences, and consequently the concept of managerial competence, which offers a view of the competence of the management in three basic pillars:

1st pillar of social and personal maturity - SM,
2nd pillar of practical and application skills - AS,
3rd pillar of general and expertise knowledge - GK.

The individual pillars of the competence of a manager interact synergistically. The holistic competence and the intelligence of a manager can be defined in this relation:

$HC = SM, AS, GK$ or even $SQ = CQ, AQ, VQ$

The competence level of the individual manager is a holistic model of competence by Porvazník (2013) and it is given by the following relations:

The level of social maturity
 $SM = SM1, SM2, SM3, SM4, SM5, SM6, SM7, SM8,$

The competencies (knowledge), general knowledge
 $GK = GK1, GK2, GK3, GK4,$

The level of application skills
 $AS = AS1, AS2, AS3, AS4.$

Fig. 1 describes the internal structure of three pillars of their individual parts. The Pillar of social maturity is divided into eight specific personality traits, knowledge pillar consists of four sub-components of the knowledge and the Pillar of application skills consists of four components of practical skills management entities. This gives a total of sixteen parts of the three-pillar model of holistic competence (Porvazník, 2013).

The figure also shows that in the hierarchy of the holistic model of competence the front pillar of social maturity occupies the most important place (Porvazník, 2011). This fact, as well as the competence of division into three pillars and their further decomposition into individual components is based on the author's nearly fifty years of scientific research and academic teaching activities. The author, however, also relies on the current state of knowledge of management practices, when experienced managers and multilingual professionals, preferably with a number for the company "desirable contacts" are chosen and recruited, but without any emphasis on their social maturity. The consequences of such a choice may be very negative for the company, in many cases, liquidation. As for the personal failure of such chosen managers and consequently even the failure of the entire enterprise - it is just the social immaturity of these managers..

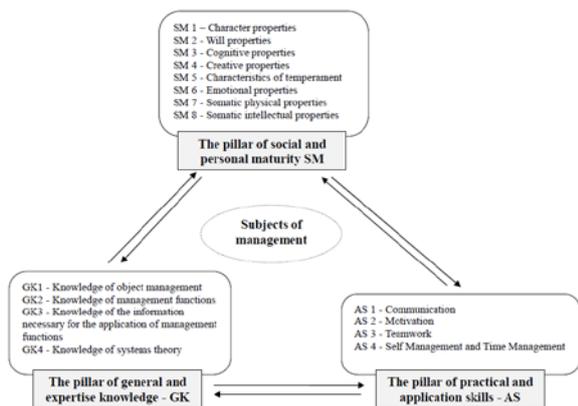


Fig.1: Model holistic competence (Porvazník, 2013)

1 Methodology

The following chapter is focused on clarifying the procedures and methods that were used in the processing of the present article. In its treatment it was necessary to use a whole variety of methods and techniques, known as logical methods and the methods used in the context of quantitative research. In the context of evaluating questionnaire was used interval measurement and subsequently they were mentioned in tables by value of scale average values (\bar{h}), the percentage expressing scale values (p).

With the help of the χ^2 – test we verified figures, which were obtained by measuring the reality and they differ from the theoretical proliferation, which corresponds to a given zero hypothesis.

χ^2 – test begins by formulating a zero and alternative hypothesis. Generally speaking, the null hypothesis (denoted H_0) is the assumption that there is no relationship between phenomena like continuity and contrast. Alternative hypothesis (denoted H_1) is a contrary assumption that there is a relationship between the observed phenomena like continuity and contrast.

In the first step was generated the hypothesis that sounds this:

In large enterprises with the selection of the employees to managerial functions the holistically competence of an applicant is assessed to a greater extent than in small and medium-sized enterprises.

The next stage represents a critical review of the literature. By using different and relevant data the sources are conducted and elaborated in a theoretical background that supports the arguments and statements, demonstrates the familiarity with a field of research, namely the articles in refereed academic journals, books, newspapers, annual reports and the searching of the available and relevant home pages via the Internet belong among the variety of secondary data.

The third step includes an illustration of authors' reasoning and concerning the analysis, using a questionnaire survey.

The questionnaire was constructed and based on the study of primary and secondary sources listed above. This pilot survey was conducted in 250 organizations in the Czech Republic.

Survey respondents were selected on the basis of a deliberate choice. The team examined did not decide the element of chance, but the judgment of the researcher. Control characters when creating quota sampling was territorial level. Selected companies had carried out its activities in the Czech Republic. The final number of processed questionnaires was 78, ie. rate was 31.20 %. When collecting data in order to obtain it (in terms of number of employees) mainly small and medium-sized

enterprises (SMEs), which had been assessed cumulatively (29 small and 23 medium-sized enterprises). This criterion was met, since SMEs accounted for two-thirds share of enterprises whose data were analyzed in the framework of the qualitative part of the survey. Data from 26 large enterprises with more than 250 employees were also analyzed, representing 33.3 % of analyzed questionnaires.

The questionnaire was sent by post or by e-mail. Data collection took place from September 2013 to February 2014.

The questionnaire included two dichotomous questions, one multiple-choice question where respondents had to choose the type of organization based on the number of employees and 19 questions where the respondent determined the degree of agreement using a five-point Likert scale. Questionnaire as a method of quantitative research is appropriate to use in the terms that the author of the questionnaire had secured them for a sufficient return. Under this condition over the applicable method, the main benefits are:

- Low cost of data collection,
- Possibility of recouping a large sample of Respondents,
- Relatively low time-consumption.

Questionnaire investigation has its limits and, therefore, it will be given in the next section method research supplemented by structured interviews with experts in the Human Resources Management area.

The survey questionnaire was assured return for help colleagues and personal contacts gained during the period of cooperation with practices that contributed to the high rate of return questionnaires.

3 Analysis and findings

The main objective of the survey was to determine and compare the level of holistic competence during the selection of recruits to managerial positions in small and medium-sized enterprises and in large enterprises.

On the basis of a questionnaire survey the Holistic level of competence was analyzed in the selecting recruits to managerial positions in enterprises executing their businesses in the Czech Republic. This level was assessed on the basis of the model presented in holistic competence in these theoretical approaches:

- The level of social maturity
SM = SM1, SM2, SM3, SM4, SM5, SM6, SM7, SM8,
- The level of general knowledge
GK = GK1, GK2, GK3, GK4,
- The level of application skills
AS = AS1, AS2, AS3, AS4.

Respondents were mainly from small and medium-sized enterprises. Structure of respondents by number of employees displayed in Tab. 1

Tab. 1: Structure of respondents by number of employees

Small and medium-sized enterprises (SME)	52	0,67
Large enterprises	26	0,33
	78	1

Respondents determined the peace of their agreement by using five-point Likert scale. A value of 1 meant that respondents completely disagree with the statement that the criterion in the selection of employees for managerial positions assesses the value 5 meant that respondents fully agree with the statement that the criterion in the selection of employees for managerial positions assessed. The higher average value (\bar{h}) the criteria by respondents to a greater extent agree with the statement that the criterion for selection consideration.

Tab. 2: The level of general knowledge

	(n)					h
	1	2	3	4	5	
GK1 - Knowledge of object management	7	15	29	15	12	3,13
GK2 - Knowledge of management functions	7	9	12	25	25	3,67
GK3 - Knowledge of the information necessary for the application of management functions	4	12	22	32	8	3,36
GK4 - Knowledge of systems theory	8	16	33	18	3	2,90

Tab. 2 shows that when choosing employees for managerial positions there are considered in particular knowledge of management functions. 25 respondents (32.05%) indicated that companies fully apply to this criterion. Knowledge of the functions of management (planning, organizing and control) therefore it is positive that the analyzed companies pay considerable attention (h = 3.67) to this issue.

It is necessary that the members of the administrative bodies are familiar with the current state of the financial and business side of the company, the strategy for its further development and the possible problems and challenges that currently the administrative authority of the organization addresses. The average value of this criterion is at 3.13. Certainly there is possibility for improvement.

As can be seen in Tab. 2, in the analyzed organizations the largest reserves have been found in the assessment of knowledge of systems theory, since the average value of the options stood at 2.90 and up to 8 respondents (10.26%) it is believed that the criterion in the selection of employees for managerial positions are not assessed at all.

Tab. 3: The level of application skills

	(n)					h
	1	2	3	4	5	
AS 1 - Communication	5	10	20	29	14	3,47
AS 2 - Motivation	4	13	10	29	22	3,67
AS 3 - Teamwork	3	11	24	19	21	3,56
AS 4 - Self Management and Time Management	6	9	15	23	25	3,67

The conducted questionnaire survey showed that the area of the application of skills to the greatest extent in recruitment for management positions is assessed by level of motivation, self management and time management (h = 3.67). However, it should be pointed out that 7.69% respondents said that the teamwork no consideration to the level of self management and time management, where is certainly possibility for improvement (Tab. 3).

It is surprising that the worst was evaluated the level of communication (h = 3.47). Fourteen respondents (17.95%) indicated that the criterion is not applicable in their organization, or almost not at all (up 37.18%). It is considered to be able to communicate as an important and essential skill of a manager.

Tab. 4: The level of social maturity

	(n)					h
	1	2	3	4	5	
SM 1 - Character properties	8	14	21	22	13	3,23

SM 2 - Will properties	2	10	17	26	23	3,74
SM 3 - Cognitive properties	4	15	26	26	7	3,22
SM 4 - Creative properties	3	8	26	28	13	3,51
SM 5 - Characteristics of temperament	8	15	25	18	12	3,14
SM 6 - Emotional properties	5	20	30	14	9	3,03
SM 7 - Somatic physical properties	8	16	30	20	4	2,95
SM 8 - Somatic intellectual properties	3	9	16	25	25	3,77

Based on Tab. 4, we can conclude that the lowest rate in the selection of employees to managerial positions considered somatic physical properties (h = 2.95). On the other hand, 24 respondents (30.36%) were completely or almost completely identified themselves with the statements that their companies are taken into account when choosing the right somatic physical properties. Highest average scale values (h = 3.77) was found in somatic intellectual properties. Of intellectual resistance should be the strengths of each manager.

The average value for the other monitored criteria ranged values of 3.03 (emotional properties) - 3.74 (will properties).

We assumed that the selection of the employees at the managerial positions is assessed in their holistic competence to a greater extent in large enterprises than in small and medium-sized enterprises. We have described a scientific hypothesis:

H: When selecting employees to managerial positions is considered holistic competent candidate in large enterprises to a greater extent than in small and medium-sized enterprises.

Was determined hypothesis H₀ and alternative hypothesis H₁:

H₀: The level of holistic competence selecting employees to managerial positions does not depend on whether the employee is from a large or small and medium-sized enterprise.

H₁: The level of holistic competence selecting employees to managerial positions depends on whether the employee is from a large or small and medium-sized enterprise.

When testing the hypothesis was used χ^2 - test.

Tab.5: Level of holistic competence – Pivot table

	(n)				
	1	2	3	4	5
Small and medium-sized enterprises (SME)	78	154	315	187	98
Large enterprises	7	48	41	182	138

Testing criterion - W:

$$W = (\chi^2_{1-\alpha} ((columns - 1) \cdot (rows - 1)), \infty) = (\chi^2_{1-\alpha} ((4) \cdot (1)), \infty) = (9,48, \infty)$$

$$\chi^2 = \sum_{i=1}^k \frac{(P_i - O_i)^2}{O_i} = 218,24$$

Validity of hypotheses:

$\chi^2 \in W$ reject H₀ and accept H₁

Based on the conducted test, we can conclude:

We have shown the significance level of 5 percent, the level of holistic competence in selecting employees to managerial positions depends on whether the employee is from a large or small and medium-sized enterprise.

52-assessment questionnaires of respondents from small and medium-sized enterprises, we found the level of holistic competence in selecting employees to managerial positions mean scale values $h = 3.09$ and evaluating questionnaires 26 respondents from large companies, we found the level of holistic competence in selecting employees to managerial positions of the average scale values $h = 3.95$ (Tab. 6). This means that when selecting employee to managerial positions is holistic assessment of their competence to a greater extent in large enterprises than in small and medium-sized enterprises.

Tab. 6: Level of holistic competence - SME, large enterprise

	(n)					h
	1	2	3	4	5	
Small and medium-sized enterprises (SME)	78	154	315	187	98	3,09
Large enterprises	7	48	41	182	138	3,95

NB. Each respondent answered 16 questions concerning the level of holistic competence in selecting employees to managerial positions, therefore the total number of responses assessed by SMEs is 832 (52x16) and the total number of responses assessed in large enterprises is 416 (26x16).

Conclusion

Based on the results of the questionnaire can be assumed that the concept of three pillars of holistic competence is not a new concept in the corporate sector and also can be argued that the selection of employees for managerial positions a holistic assessment of their competence to a greater extent in large enterprises than in small and medium-sized enterprises. Given this fact, it will require further research, which will be held just in terms of small and medium-sized enterprises, consequently it corresponds to the objectives of the author, which have been established in the context of her doctoral studies. However, as mentioned, the questionnaire has its limits.

This issue will be further in research supplemented by structured interviews with experts in small and medium-sized enterprises engaged in the tendering processes for the position of managers and further the experts who are dedicated to issues of personnel management, management and human resources development.

Eventually, in a further ongoing research will be desirable to identify barriers to implementation of holistic knowledge management and especially the concept of holistic competence, now used by large enterprises, in practice SMEs. The next step should be to design a simple model of the implementation of holistic competence for recruits who will be accepted to interesting positions in the category of small and medium-sized enterprises.

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Primary Paper Section: A

Secondary Paper Section: AE

COMMUNICATIVE COMPETENCE OF CHILDREN WITH MENTAL DISABILITY

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Abstract: The subject of the lecture is to define basic terminology and to introduce the results of the research oriented on determination the level of differentiation of partial abilities of pupils in chosen spheres of communicative competence. This was done in comparison with expected outcomes for pre-school education. On the basis of the analysis of the results the article contains specific suggestions and measures in special-pedagogical support for pupils with mild mental disability in primary education.

Keywords: pupil with mild mental disability, key competences, communicative competence, partial abilities, special-pedagogical support, supportive measures, curriculum documents for primary education.

1 Introduction

School integration of pupils with health disability can also be seen as an important means of positive influence of attitudes of majority society towards people with health disabilities. Existing experience points to the fact that school integration of pupils with health disability is a difficult process mainly because it requires significant change in the current organisation and style of education in our schools. From these requirements arise higher demands for professional competences of teachers. The development of universal, effective and open communication is thus a principal goal of primary education. The process of education is in our educational system based on adequately developed language and communication abilities and skills in spoken and written form, on the achieved level of communicative competence corresponding to the content of education in given fields. The school integration of pupils with mental handicap appears to be one of the most difficult ones, since deviation in communication is always a symptom of mental disability, where direct proportionality is valid – the higher the degree of mental disability, the more severe speech disorders. Only on the basis of realization of the nature, rules and mechanisms of psychomotor development of pupils with mental handicap we can select and apply appropriate educational and special educational means in order to develop language and language competence of pupils in order to develop the communicative competence.

2 The analysis of communicative competence of pupils with mental disability in primary education

The Aims and Methods of the Research

In the conception of the planned research we started with the presumption that reaching the aims of primary education is conditioned by the abilities to perceive and listen to the content of educational offer, to understand the communicated and subsequently to reproduce one's own pieces of knowledge in written or spoken language. The aim of the research was to analyse pupils with mild mental disability in primary education from the perspective of the acquired level in selected areas of communicative competence in comparison with the expected outcomes in selected areas of preschool education¹. (Table 1) On the basis of obtained results it aims to characterise specific performances of pupils in the area of acquisition of communicative competence and deduce possible risks related to fulfilling educational goals (expected outcomes) in primary education.

¹ Educational aims in primary education are logically linked to the educational goals of preschool education, therefore observed partial capabilities result from The Frame Educational Programme for Preschool Education, educational area Child and their psyche – subareas Language and Speech, whose content greatly corresponds to the expected outcomes in the area of communicative competence for preschool education and it corresponds to the determined goals of the research.

Areas of Communicative Competence	Item No.	Selected Partial Capabilities
Controlling Speech, Formulating Thoughts Adequately	1	To name most of the things surrounding them
	2	To ask many questions
	3	To formulate sentences in a suitable and grammatically correct way
	4	To use complex sentences in speech
	5	To use simple sets of complex sentences
	6	To use all kinds of words
	7	To follow a story
	8	To tell a story, to describe a real situation
	9	To create simple rhymes
	10	To follow natural intonation, loudness and pace of the speech
	11	To pronounce most phones correctly
	12	To articulate clearly
	13	To be emotionally stable
Sharing Feelings and Moods	14	To express current emotional expressions naturally
	15	To use words expressing aesthetical sense, to express positive aesthetical experiences
Communicating Through Gestures and Words	16	To react to modulating tones of speech (colour, strength and pitch of the voice, stress, intonation)
	17	To be able to express mood via facial expressions (smile, crying, anger, sorrow)
	18	To understand word wit and humour
	19	To use semantic words
	20	To understand heard communication
	21	To differentiate some graphical symbols, e.g. pictographs
	22	To be able to imitate various ways of behaviour
Communication with Children and Adults	23	To use speech to regulate events around them
	24	To communicate adequately to the given situation (to know what is appropriate)
	25	To apply the habits of social behaviour (to greet, to say please, to thank, to listen to information, to follow instructions...)
	26	To improve regulatory function of speech
	27	To comment on their experiences, activities
	28	To speak autonomously on a given topic
	29	To accept compromises, to be able to solve conflicts by an agreement
Mastering the Abilities Preceding Reading and Writing	30	To show interest in books, magazines
	31	To follow text using eyes from left to right
	32	To acquire graphical form of speech without larger difficulties
Widening Vocabulary	33	To learn new words easily
	34	To ask about words they do not understand
	35	To be able to repeat plot in correct sentences
	36	To capture the main idea of a plot
	37	To be able to reproduce a short text by heart (rhyme, song, dramatic task...)
	38	To comment on the result of their creative activities (e.g. constructive, artistic, physical...)
Using Information and Communication Means	39	To show interest in books
	40	To focus on listening to reading
	41	To focus on listening to music
	42	To focus on watching a film
	43	To focus on watching a theatre performance
	44	To manage basic television operations
	45	To manage basic computer operations
	46	To manage basic telephone operations
Communication in Foreign Languages	47	To be able to learn foreign language

Table 1: The Overview of the Areas of Communicative Competences and Assessed Partial Capabilities

3 The relaxation of the research

The research was of quantitative character with the use of the method of asking questions, which was realised by the application of research means of *observation record sheets*. By using the record sheets of observation we investigated the indicators of the reached level of selected partial capabilities of communicative competence in pupils with mild mental disability based on long-term observation. Through a simple sheet filled in by a pupil we assessed the level of selected language and communicative capabilities of the individual pupil. Teachers quantified the level of their judgement by determining it on a numerical scale using given instructions (see the example):

	Never	Rather No	Rather Yes	Always
Speaks Autonomously	0	1	2	3

Instructions:

- If you think that the pupil always speaks autonomously, circle 3.
- If you think that the pupil never speaks autonomously, circle 0.
- Based on how often they speak autonomously, circle either 1 or 2.
- If you were wrong, cross out the answer and circle the correct one.

The primary task of collecting empirical data in relationship to the respondents and fulfilling the research was to address as many respondents as possible so that the validity of the answers to the questions in the *observation record sheets*.

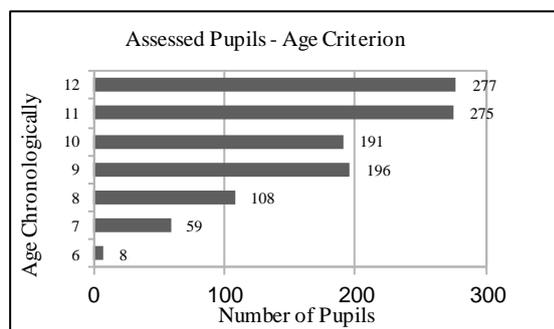
The research project was carried out at primary schools educating pupils with mild mental disability. We addressed teachers taking part in the education of pupils with mild mental disability in primary education from the whole Czech Republic. The actual collecting of empirical data for quantitative research depends on the participation of the teachers involved in the research related to their willingness to carry out orientational assessment of selected partial capabilities of pupils.

The basic set of the research was formed by pupils with mild mental disability in primary education. The selected set of the research was formed by pupils with mild mental disability fulfilling the following criteria:

- they are pupils of primary education (with no respect to the form of special education²);
- their mother tongue is Czech language;
- the teachers are in contact with them for at least one school year;
- in pupils it is possible to orientationally assess, based on long-term observation, the acquired level in selected partial capabilities of communicative competence.

Altogether 249 schools in the Czech Republic were addressed. The research was supported by 119 schools, among which schools from all Czech regions participated. Finally, 414 respondents took part in the research by filling in 1114 questionnaires.

During the research altogether 1114 pupils were assessed in partial capabilities of communicative competence. Out of these 0,7 % (8) were 6-year-old, 5,3 % (59) 7-year-old, 9,7 % (108) 8-year-old, 17,6 % (196) 9-year-old, 17,2 % (191) 10-year-old, 24,7 % (275) 11-year-old, 24,8 % (277) 12-year-old pupils. (Graph 1)



Graph 1: Assessed Pupils Based on the Age Criterion

The way of analysis of the collected data

The evaluation of empirical research was done by statistic method via procedures of basic descriptive statistics. The aim

was to graphically and numerically summarize the results and to describe the situation in the research area. The higher levels of analysis were used in specific cases of verifying stated research hypotheses. For verifying the hypotheses we used chi-square goodness of fit test. The determined p-value of test criterion was compared with the level of importance 0,05.

Average level of selected partial capabilities in all pupils was determined by arithmetic mean (quotient of the sum of all points in the scale by the number of pupils).

Acquired level of pupils in defined areas of communicative competence was determined via score calculated for each pupil by adding the points on the scale in n chosen partial capabilities (in relation to the observed area). By calculating the frequencies in all pupils the following levels were determined:

0 to n	points	low level
$n + 1$ to $2n$	points	medium level
$2n + 1$ to $3n$	points	high level

4 The evaluation of the research

The results of the research show the level of partial capabilities of communicative competence in pupils with mild mental disability. They confirm uneven differentiation of partial brain functions and also their limited level.

By the analysis of the results of the research we found out that:

- In primary education pupils with mild mental disability do not reach high level in comparison to the expected outcomes of preschool education in any of the observed areas;
- In primary education pupils with mild mental disability reach medium level in comparison to the expected outcomes of preschool education in selected areas:
 - Controlling speech, appropriate formulation of thoughts
 - Communicating feelings and moods
 - Communication through gestures and words (expected low level was not confirmed)
 - Communication with children and adults (expected low level was not confirmed)
 - Managing abilities preceding reading and writing (expected low level was not confirmed)
 - Widening vocabulary
 - Using information and communication means (expected low level was not confirmed);
- In primary education pupils with mild mental disability reach low level in comparison to the expected outcomes of preschool education in the area:
 - Preconditions for communication in foreign languages.

Possible Risks Related to Fulfilling Educational Goals in Primary Education

We assume that from the perspective of reaching educational goals of primary education the most risky capabilities are those that pupils *do not have or rather do not have differentiated*³ during primary education. (Table 2)

Communicative Competence	Assessed Partial Capabilities
Controlling Speech, Formulating Thoughts Adequately	Simple rhyming Speaking using more complex sentences Grammatical correctness of sentence formulation
Communication in foreign languages	Preconditions for communication in foreign languages

Table 2: Capabilities that Pupils Do Not Have or Rather Do Not Have Differentiated

In the remaining selected areas of communicative competence (to share feelings and moods, to communicate through gestures and words, to communicate with children and adults, to manage the abilities preceding reading and writing, to widen vocabulary,

² Regulation no. 73/2005 Coll., as amended.

³ These partial capabilities reach level *not* or they significantly tend to level *rather not*

to use information and communication means) the research did not confirm high risks in any of the assessed partial capabilities. On the basis of the analysis of the results we further assume that from the perspective of reaching educational goals of primary education, medium risky are such capabilities that pupils in primary education more often *have differentiated*⁴. (Table 3)

Communicative Competence	Assessed Partial Capabilities
Controlling Speech, Formulating Thoughts Adequately	To use simple sets of complex sentences To use all kinds of words To ask many questions To tell a story, to describe a real situation To follow natural intonation, loudness and pace of speech To articulate clearly To pronounce most phones correctly
Sharing Feelings and Moods	To be emotionally stable To use terms expressing aesthetical sense To express current emotional expressions naturally
Communication Through Gestures and Words	To use semantic words To understand word wit and humour To differentiate some graphic symbols To be able to imitate various ways of behaviour
Communication with Children and Adults	To show interest in books, magazines To acquire graphic form of speech without larger difficulties
Managing the Abilities Preceding Reading and Writing	To capture the main idea of a plot To learn new words easily To ask about the words they do not understand To comment on the result of their own creative activities To reproduce a short text by heart
Widening Vocabulary	To show interest in books, magazines To acquire graphic form of speech without larger difficulties
Using Information and Communication Means	To show interest in books To focus on listening to reading

Table 3: Capabilities that the pupils have rather differentiated

We assume that from the perspective of fulfilling educational goals of primary education the least risky capabilities are those that pupils during primary education *have differentiated*⁵. (Table 4)

Communicative Competence	Assessed Partial Capabilities
Controlling Speech, Formulating Thoughts Adequately	Simple rhyming Speaking using more complex sentences Grammatical correctness of sentence formulation
Communication in foreign languages	Preconditions for communication in foreign languages

Table 4: Capabilities that the pupils have differentiated

5 Special pedagogical recommendation for theory and practise

The realised research confirms the presumptions that in the course of primary education pupils with mild mental disability do not have anchored partial capabilities in selected areas of communicative competence in comparison with the expected

outcomes of preschool education. We assume that this finding predicts the decrease in school success and it threatens fulfilling of already modified educational goals (reaching expected outcomes) not only in primary education.

For the pupils with mild mental disability during the 1st period (1st to 3rd year) it is necessary to create a *system of Supportive measures for the development of communicative competence* in order to:

- reduce negative impact of partial capabilities, which are not or are rather not differentiated (high risks)
- reduce or eliminate negative impact of partial capabilities, which are rather differentiated (medium risks)
- anchor and automatize those partial capabilities that are differentiated (low risks)

Suggestion of Supportive Measures for the Development of Communicative Competence:

⁴ These partial capabilities do not reach but significantly tend to the level *rather yes*

⁵ These partial capabilities reach the levels *rather yes* or they significantly tend to the level "yes"

Update general characteristics of the area of education Language and Language competence:

- In the goals of the area of education:
 - to stress pragmatic goal of education towards communication and practical preparation of pupils for everyday communication with people in various communication situations through language and other language means.
- In the content of the subject matter:
 - to stress the development of auditory differentiation of speech, listening with understanding and reading with understanding.
- To widen the area of education Language and Language Communication by a new (or supplementing) field of study Dramatic Education in order to support the development of communicative competence.
- In the education of communication as well as during the therapy of symptomatic speech disorders in children with mental disability it is necessary to carefully take care of the requirements for language communication (expressive component) being in accordance with the level of language competence (receptive component). If the requirements for the language communication (in spoken or written form) are inadequate, the process of acquisition of communicative competence may be deformed. The primary task of the support of the development of communicative competence in pupils with mild mental disability is the stimulation of the development of internal language capabilities (language competence) and the support of formulation of thoughts. Secondly, we develop the formal aspect of speech, i.e. the articulation of phones or their graphical form.

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Primary Paper Section: A

Secondary Paper Section: AM

D EARTH SCIENCES

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DETERMINATION OF NITRATE NITROGEN IN SURFACE WATER: COMPARISON OF DISTILLATION-TITRATION AND SPECTROPHOTOMETRIC METHODS

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This work was supported by the IGA – Internal Grant Agency Faculty of Agronomy MENDELU reg. No. IP 23/2013. And this work was supported by the program "Excellence of doctoral studies" registration no.: CZ.1.07/2.3.00/20.005 and National Agency for Agricultural Research (NAZV), project: *The possibilities for retention of reactive nitrogen from agriculture in the most vulnerable infiltration area of water resources*, registration no.: QJ 1220007.

Abstract: This work deals with comparison of two methods for determination of mineral nitrogen in surface water. The distillation-titration and spectrophotometric methods were compared. From January to September 2013, mineral nitrogen was determined by both methods in samples, which were taken from seven sites. These sites are located in CHKO Jizera Mountains. Water sampling was carried out every month (from April to August 2013). Based on the statistical analysis of results from each method, distillation-titration method is more accurate than spectrophotometric method.

Keywords: nitrogen, surface water, distillation-titration method, spectrophotometric method

1 Introduction

Nitrogen is a key element for all living organisms, because it is an essential component of proteins and nucleic acids. Aber et al (1989), Nohel et al. (2008) and Donatela et al. (2010) point out dangers of high input of reactive nitrogen (N_r).

Although the element nitrogen is extremely abundant making up 78% of the Earth's atmosphere, it exists mainly as unreactive form as di-nitrogen (N_2). In contrast, reactive nitrogen forms are needed to be useable by most plants and animals. These include oxidized and reduced nitrogen compounds, such as nitric acid, ammonia, nitrates, ammonium and organic nitrogen compounds. Each of it is normally scarce in the natural environment (Sutton, 2011). Reactive nitrogen is defined here as all other nitrogen forms in our system apart from N_2 . This includes oxidized nitrogen, mainly NO , NO_2 , NO_3 ; reduced forms of nitrogen: NH_4^+ , NH_3 and organic nitrogen: proteins, amines, etc., with different stages of oxidation (Erisman, 2011).

The major threat to the quality of surface water is mineral nitrogen (N_{min}). N_{min} is a reactive nitrogen consisting of ammonia (NH_4^+-N) and nitrate (NO_3^--N) nitrogen.

Nitrogen may occur in surface water by direct runoff or by infiltration through the root zone and discharge to surface water through seepage or tile drainage systems Zebarth et al. (1999).

Nitrogen is a fundamental component of organic and mineral agricultural fertilizers, natural substances and fossil fuels. Nitrogen is essential for the functioning of all living ecosystems. Anyway, if there is too much nitrogen in surface water, it is a great problem, because nitrogen can accelerate eutrophication. An increased concentration of mineral nitrogen in surface water presents negative impact on biodiversity and quality of such water (Sutton, 2011).

The most dangerous are nitrates, because they are very mobile in soil. They have a negative charge (NO_3^--N) and soil sorption complex has minimal affinity for negatively charged particles. Leaching of nitrate nitrogen from arable soil is a major threat to the quality of drinking water from underground reservoirs in the Czech Republic (Záhora & Mejzlík, 2007; Elbl et al., 2013).

Therefore, the adequacy of methods for NO_3^--N determination was investigated. Hypothesis, if those differences between distillation-titration method and spectrophotometric methods exist, was tested. Realized terrain experiment has been

investigated for the research of minerals forms in soil and water, which has already been carried out for a long time in the Department of Microbiology and in the Department of Landscape Ecology.

2 Materials and Methods

2.1 Experimental Sites

Experiment was carried out in CHKO Jizera Mountains. This area is on the north of Czech basin at the borders of Poland (see the Figure 1). Six experimental sites (Rynoltice – R, Smědá – SM and Jizerka - J) were selected from this area. Individual sites were always chosen above (R1, SM1, J1) and below (R2, SM2, J2) the municipalities:

Rynoltice - Panenský potok (Virgin Stream) springs 0,5 km to the east far from Jitřava in 650 m a.s.l., it empties into the Ploučnice River in Mimoň. Its watershed is 133,2 km² wide, the length of the flow is 28,8 km. Average flow in the river is 1,10 m³·s⁻¹. It's a significant water flow with trout water. The part of river up to Jablonné v P. is continuously regulated with a fringe planting of Canadian poplar. The rest of the river has comparatively natural flow with a preserved floodplain with rests of wet meadows.

Smědava is a name of area around chalet of the same name in Jizera Mountains in 847 m a.s.l. It is a place of confluence of rivers Bílá, Černá and Hnědá Smědá (White, Black and Brown Smědá) and therefore of emergence of the river Smědá. The chalet Smědava, with a larger part of parking lots around, belongs to the municipality Bílý Potok (White Stream). In north of the chalet, there is a group of houses, which belong to the Hejnice town.



Fig. 1 Area of our interest

The first mention of **Jizerka** settlement dates in 1539, when it used to be the site of fowlers. Later, lumberjacks and collectors of precious stones came. In the mid-19th century, two glassworks were established there. One of them is still working. The stream of the same name flows through the settlement as well as a stream Saphir, where deposits of precious stones were found (sapphire, ruby, chalcedony, topaz). About 10 inhabitants permanently live there. Jizerka is exceptional by its altitude, which is 850 – 900 m a.s.l. The combination of the altitude, relief of the valley and the river Jizerka supports the extreme weather in winter time. For example, the maximum snow depth (29. 4. 1944) was 315 cm. Instantaneous measured value -36 °C appeared there several time. Temperature under the freezing-point occurs even in the summer (Bercha, 2006, Zákoutská et al., 2013).

2.2 Design of the experiment

Nitrate nitrogen (NO_3^--N) was measured by spectrophotometric and distillation-titration methods in water samples taken from the area of our interest. The water sampling was performed once a month from April to August 2013. These values were used to determine the influence of the intensity of settlement on the

quality of surface water and to identify possible differences between the individual methods.

Accuracy of each method was determined using standard solutions. Solutions of known NO_3^- -N concentration were prepared. Concentration of NO_3^- -N was determined by both methods in individual solutions. The measured values were statistically evaluated and used to determine the accuracy of each method.

2.3 Spectrophotometric determination of the nitrate nitrogen concentration (in surface water)

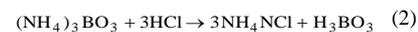
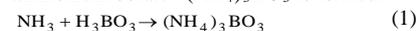
Spectrophotometric method was performed according to Hach-Lange Method 10071 – Persulfate Digestion Method for spectrophotometer DR/400. An alkaline persulfate digestion converts all forms of nitrogen to nitrate. In well aerated water, the most of the mineral nitrogen is in the form of nitrate (Tyson, 2011). Sodium metabisulfite is added after the digestion to eliminate halogen oxide interferences. Nitrate then reacts with chromotropic acid under strongly acidic conditions to form a yellow complex of absorbance maxima at 410 nm (Hach-Lange Methodology; Zákoutská et al., 2013).

2.4 Distillation-titration determination of the nitrate nitrogen concentration (in surface water)

Water samples were collected into the 120 ml plastic bottles and transported to the laboratory. Samples were stored at 4 °C before the determination. Nitrate nitrogen was determined together with ammonium nitrogen, because nitrate nitrogen is determined after ammonium nitrogen using distillation-titration method.

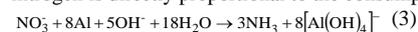
Concentrations of NO_3^- -N and NH_4^+ -N were measured using distillation-titration method by Peoples et al. (1989). Principle of this method is given in Eq. (1) – (3) and calculation is shown in Eq. (5).

NH_4^+ -N was determined by distillation-titration method in an alkaline solution after the addition of MgO. During heating of sample, NH_4^+ -N is released from the sample in the form of ammonia (NH_3). Subsequently during cooling of the sample, NH_3 is taken into boric acid (H_3BO_3 with indicator). Thus, ammonium borate - (NH_4)₃ BO_3 is formed.



Consumption of HCl during titration indicates the amount of ammonium nitrogen, which was displaced from sample.

Nitrate nitrogen was determined in the same manner using Devard's alloy (mixture of 50% Cu, 45% Al and 5% Zn). This alloy reduces NO_3^- -N to NH_3 (Eq. 3). Subsequently NH_3 is determined according to Eq. 1 and 2. The amount of nitrate nitrogen is directly proportional to the consumption of HCl.



Concentration of NO_3^- -N was calculated according Eq. (4):

$$\text{mg } \text{NH}_4^+ \text{ - N or } \text{NO}_3^- \text{ - N} = \quad (4)$$

$$\left(\frac{\text{normality of standart HCl}}{0.03571} \right) \times 0.5 \times \text{titration}$$

This method of determination of nitrogen in water solutions, soil solutions and chemical extracts have already been published (Záhora & Mejzlík, 2007; Novosadová et al., 2011; Elbl et al., 2013a; 2013b; Plošek et al., 2013) and described by Peoples et al. (1989) and Weaver et al. (1994). Moreover, determination of nitrate and ammonium nitrogen after reduction by Devard's alloy is specified in ČSN EN 15476.

2.5 Statistical Analysis

The measured values of nitrates nitrogen from individual methods were analyzed by one-way analysis of variance (ANOVA; $P < 0.05$) in combination with post-hoc Tukey's HSD test ($P < 0.05$). All data were analyzed in Statistica CZ 10 software. Graphic processing of measured data was performed in Microsoft Excel 2010 and Statistica 10 software.

3 Results and Discussion

3.1 Validation of the measurement methodology for the determination of nitrate concentration in surface water – Comparison of Spectrophotometric and Distillation-titration methods

Comparison was made from the results obtained applying both methods to several standard samples covering a range of concentration (NO_3^- -N) from 0.25 mg/l to 7.5 mg/l. Samples of known concentration were prepared from the calibration solution (reg. no.: CZ 970761H5, primary substance: NH_4NO_3 99.999%, manufacturer: ANALYTIKA). Concentration of nitrate nitrogen was determined using the Spectrophotometric (SPM) and Distillation-titration methods (DTM). Three replicates of each sample were analyzed by these methods. The mean of the differences between the real values (standards) and the measured values (by individual methods) are shown in the Table 1.

Table 1 Comparison of SPM and DTM accuracy

Standard solution (mg/l)	Methods	Differences (%)	P
S1	SPM	-5.93	0.026148
3.75	DTM	2.07	0.019373
S2	SPM	6.72	0.016065
3.125	DTM	6.39	0.014396
S3	SPM	-8.70	0.000832
2.5	DTM	2.96	0.104029
S4	SPM	-5.49	0.001967
1.25	DTM	2.01	0.079200
S5	SPM	6.72	0.121690
0.625	DTM	5.06	0.033756
S6	SPM	-8.70	0.074180
0.25	DTM	5.63	0.059712
S7	SPM	-6.25	0.129612
0.125	DTM	4.05	0.319096

Comment for the Table 1: Weighted average (\bar{x}) of differences between standard solution (ST) and individual methods (SPM or DTM) are presented there. Individual differences were analyzed using T-test. The means of differences are significant at the level 0.05 ($P < 0.05$). These differences are shown in **bold numbers** (red for SPM and black for DTM).

The Table 1 shows significant differences between concentration of standard solution and concentration that were determined by individual method. The largest differences were found when using SPM. These results indicate that DTM is more accurate than SPM. If we compare the total average efficiency, the difference will be minimal. The average efficiency of each method was: SPM = 93.07 % and DTM = 95.97 %, these results are not significant.

Beda & Nedospasov (2005) state, that the accuracy of the spectrophotometric methods may be affected by increasing concentrations of the analyte. The above information shows that optical methods have a limited range of applicability depending on the concentration of nitrate. Consider the Table 1, data presented here show significant differences were found in variant with highest concentrations of nitrogen (1.25 mg/l – 3.75 mg/l of NO_3^- -N). The second factor that could affect accuracy of the measurement is the quality of the reagents and the optical purity of the cuvettes. Sensitivity of optical methods, for instance, is confirmed by Moorcroft et al. (2001).

3.2 Concentration of nitrate nitrogen in surface waters

Nitrate nitrogen is an important indicator of pollution of surface waters. Amount of nitrate nitrogen in samples taken from April to August 2013 were determined by both methods. Data are shown in the Table 2.

The Table 2 presents data of cumulative concentration of NO_3^- -N for five months (from April to August 2013) in surface water at individual locations. These data indicate differences between SPM and DTM in determination of NO_3^- -N at variants R1, R2, anyway, significant difference was found only at variant R2. The highest concentrations of pollutants (NO_3^- -N) were measured at

variant R1 and R2, thus at the locations with the most developed settlement. Negative effects of human settlement on water quality are confirmed by (Coote & Gregorich, 2000 and Sutton, 2011).

Table 2 Concentrations of nitrate nitrogen determined by SPM and DTM in surface water at individual locations

Experimental site	SPM		DTM	
	NO ₃ ⁻ -N (mg/l)	±SE	NO ₃ ⁻ -N (mg/l)	±SE
R1	19.53	10.01	1.83	0.40
R2	13.48	4.58	4.03	0.50
SM1	2.10	1.28	0.39	0.09
SM2	2.61	0.94	0.79	0.29
J1	3.82	1.23	0.78	0.56
J2	3.29	1.42	0.29	0.02

Comment for the Table 2: Weighted average (\bar{x}) of nitrate nitrogen with SE (standard error) are presented there. These parameters were calculated from five measurement (n = 5) by Statistica 10 software for each experimental site.

The above Table 2 shows great differences between individual experimental sites (this fact is real for the results obtained from the SPM and DTM). Reason of this: water quality differs depending on the season and on geographic area. The background chemistry of river and lake water is determined by soil, geologic formations, terrain, and vegetation in the drainage basin and also by human activities such as agriculture, industry, transport etc. (Coote & Gregorich, 2000). Experimental sites SM1, SM2, J1 and J2 are located in the protection zone of CHKO Jizera Mountains, but another sites R1 and R2 are situated outside this protection zone. Moreover, experimental sites R1 and R2 are the most populated. And therefore, there is the increased leakage of pollutants into the watercourse.

Differences between individual variants of the experiment were not analyzed, only differences between methods of determination concentration of NO₃⁻-N at individual variants were analyzed by ANOVA with post-hoc Tukey's HSD test (P<0.05). This analysis is divided in two parts and presented in the following Tables 3 and 4.

The values of NO₃⁻-N concentration determined at individual sites are presented in the Table 2. These data indicate large differences between SPM and DTM, although these differences are significant only at variant R2 (consider Table 4). Large differences between individual methods in variants R1, R2 could be caused by improper water sampling. Silva et al. (2000) point to the fact that processing and sampling has crucial influence on the precision of the determination of nitrogen compounds in the water.

Table 3 Analysis of variance for individual experimental sites

Experimental site	Methods	95% Confidence interval		F	P
		Lower bound	Upper bound		
R1	SPM	-8.27	47.33	3.118	0.115
	DTM	0.71	2.95		
R2	SPM	-0.04	6.45	5.619	0.045
	DTM	0.02	0.80		
SM1	SPM	-0.33	1.52	0.722	0.420
	DTM	-0.05	0.64		
SM2	SPM	0.32	2.57	0.833	0.388
	DTM	-0.60	2.29		
J1	SPM	-32.07	71.21	0.0005	0.982
	DTM	-33.07	71.02		
J2	SPM	-0.29	1.98	2.279	0.169
	DTM	-0.31	0.66		

There is a presumption that samples of water, which were collected for SPM, were of a different composition. This situation was due to character of watercourse. Samples were collected at the point where the flow was directly affected by sewage water. Sampling was performed for each method

separately and because sampling was complicated by approach to watercourse, time intervals were created between individual sampling (about 10 minutes). During this time, waste water from the surrounding buildings contaminated water flow and thus subsequently collected samples.

Table 4 Detailed comparison of SPM and DTM by Tukey's HSD test

Number of cell	Experimental site	Methods	Mean difference	
			(1)	(2)
1	R1	SPM	-	0.1155
		DTM	0.1155	-
2	R2	SPM	-	0.0453
		DTM	0.0453	-
1	SM1	SPM	-	0.4203
		DTM	0.4203	-
1	SM2	SPM	-	0.3820
		DTM	0.3820	-
1	J1	SPM	-	0.9825
		DTM	0.9825	-
1	J2	SPM	-	0.1697
		DTM	0.1697	-

Comment for the Table 4: The means of differences are significant at the level 0.05 (P<0.05). These differences are shown **in bold**. Methods (SPM and DTM) were always compared for one experimental site.

The used methods differ one from other by principle and method of determination. Therefore, both methods have different specifics which are the reason for their advantages and disadvantages for determination of nitrate nitrogen in surface water. The main advantages of SPM are low cost, compactness and speed of execution. Conversely, the main disadvantages are maintenance of the equipment, necessity of using original reagents and distortion of the measurement by contamination with solid material (lightproof material).

DTM is suitable for the determination of mineral nitrogen in the soil solution, extracts (KCl, NaCl), samples of water and solution from organic matter (for example compost). DTM is very fast, accurate and affordable analytical method, but for its successful implementation, quality analytical chemicals are necessary. Moreover, the analysis (DTM) must be performed by trained person in order to minimize inaccuracies caused by incorrect settings of device or inaccurate dosing of chemicals (Peoples et al., 1989 and Weaver et al., 1994).

Conclusions

This work presents results of DTM and SPM comparison. These results confirm our hypothesis. It is obvious that results from sampling and determining of water quality indicators set by spectrophotometric method have the same predictive value as distillation-titration one.

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Primary Paper Section: D, G

Secondary Paper Section: EH, DA

RESPIRATION ACTIVITY AND DEVELOPMENT OF ARBUSCULAR MYCORRHIZA IN LYSIMETRIC EXPERIMENT WITH DIFFERENT TYPE OF FERTILIZATION

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The work was supported by the National Agency for Agricultural Research (NAZV), project: The possibilities for retention of reactive nitrogen from agriculture in the most vulnerable infiltration area of water resources, registration no. QJ 1220007.

Abstract: This paper deals with the effect of organic and mineral (nitrogen) fertilizers on the respiration activity and roots colonization by arbuscular mycorrhizal fungi. Soil respiration is an important component of terrestrial carbon cycling and one part of the biological properties of soil. Another biological property is arbuscular mycorrhiza (AM) which is one of mycorrhizal symbiosis types which are formed between plant roots and fungi. It was prepared seven lysimetric variants ($n = 3$) with different type of fertilization (compost and mineral nitrogen). We detected high differences between basal respiration (BR) and substrate induced respiration (SIR) after first year of the experiment. BR significantly decrease and SIR increase in most of variants. Influence of compost addition to roots colonization of winter wheat by AM fungi has not been confirmed. The highest roots colonization was detected in variant without the addition of fertilizers.

Keywords: basal respiration, substrate induced respiration, arbuscular mycorrhiza

1 Introduction

Composting is one of the oldest methods for processing of organic waste. Also in modern times this process is more and more often taken into consideration in waste management strategies (Kopéc *et al.*, 2013). The advantages of the use of organic wastes such as compost as fertilizers are evident. Their use would reduce the consumption of commercial fertilizers which need in their production high cost and energy (Romero *et al.*, 2013). Compost amendment improves physical, chemical and biological properties of soils, in particular by increasing available nutrients mainly in the organic soil fractions (Diaz *et al.*, 2007). The present work's goal was to evaluate effects of addition of compost and N on respiration activity (CO_2 production) and mycorrhizal roots colonization. Respiration activity of composts is one of many indicators of their maturity and usefulness for application. The degree of compost maturity also affects its fertilizer value. Arbuscular mycorrhiza (AM) is one of mycorrhizal symbiosis types which are formed between plant roots and fungi (Stroblová *et al.*, 2005). The soil represents a natural source of arbuscular-mycorrhizal fungi propagules (spores, soil mycelium and infected root parts) which are of importance for the origin of mycorrhizal infection (Vázquez *et al.*, 2002).

2 Material and methods

2.1 Experimental design

Effect of addition of different types of fertilizers was tested by pot experiment, previously detailed by Elbl *et al.* (2013).

Twenty one lysimeters have been used as experimental containers and located in the area. The experiment was conducted in the protection zone of underground source of drinking water Březová nad Svitavou, where annual climatic averages (1962-2012) are 588.47 mm of precipitation and 7.9 °C mean of annual air temperature. The lysimeters were made from PVC (polyvinyl chloride). Each lysimeter was the same size and was filled with 25 kg of subsoil, 25 kg of topsoil (arable soil) and with compost in selected variants. See Figure 1.

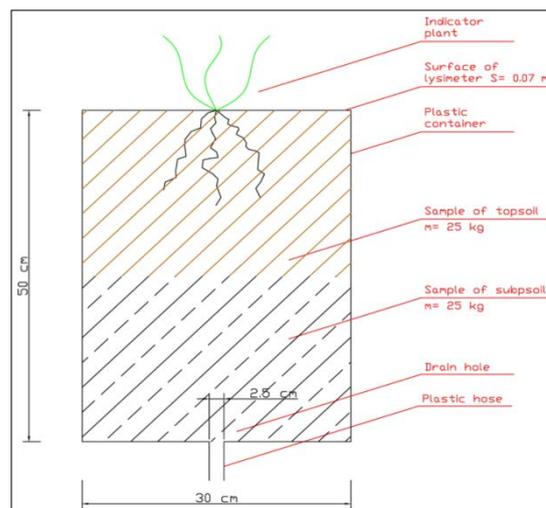


Fig. 1: Detail of experimental container – lysimeter according to Elbl *et al.* (2013)

Topsoil and subsoil were collected from a field in the area. Soil samples were sieved through a sieve (grid size of 10 mm) and homogenized. Topsoil and subsoil were prepared separately. Each lysimeter had one drain hole and PVC hose for collecting soil solution. Hose leads into the plastic bottle. All lysimeters were buried into the ground. Collection of soil solution and monitoring of the lysimeters was carried out in the control shaft. Lysimeters were completed and filled in October 2012. Winter wheat was used as a nodal plant to determine the effect of addition of different types of fertilizers, microbial activities and weather on plant production. Winter wheat (22 grains into each of lysimeters) was planted in the end of October.

Seven variants of the experiment were prepared, each one in three repetitions:

- C1 – arable soil with the addition of 100 % of recommended dose of N,
- C2 – arable soil without the addition of fertilizers,
- K1 – arable soil with the addition of 100 % of recommended dose of compost,
- K2 – arable soil with the addition of 100 % of recommended dose of compost and 25 % of recommended dose of N,
- K3 – arable soil with the addition of 100 % of recommended dose of compost and 50 % of recommended dose of N,
- K4 – arable soil with the addition of 100 % of recommended dose of compost and 100 % of recommended dose of N,
- K5 – arable soil with the addition of 200 % of recommended dose of compost.

Information on the applied fertilizers: Compost (Černý drak) samples were taken from the Central Composting Plant in Brno and it is registered (under the Fertilizers Law) for agriculture use in the Czech Republic. Nitrogen was applied as a liquid fertilizer DAM 390. DAM 390 is a solution of ammonium nitrate and urea with an average content of 30% nitrogen (1/4 of nitrogen is in the form of ammonium, 1/4 is in the nitrate form and 1/2 is in the form of urea). One hundred liters of DAM 390 contain 39 kg of nitrogen. Recommended dose in Czech Republic of compost is 5 kg m⁻² per 5 years and of nitrogen is 140 g m⁻² per year for winter wheat.

2.2 Basal and substrate induced respiration

Basal respiration (BR) was determined by measuring the CO_2 productions from soil samples incubated in serum bottles for 24

h. Soil samples (15 g, humidity 20 %) was weighed into each of five 120-ml serum bottles. Bottles were sealed with butyl rubber stoppers and incubated at 25 °C. After 3 and 24 h, a 0,5-ml sample of the internal atmosphere in each bottle was analyzed by gas chromatography (Agilent Technologies 7890A, equipped with a thermal conductivity detector). Respiration was calculated from the increase in CO₂ during 21-h incubation period (24-3h). At the end of measurements, the total headspace volume for each replicate bottle was determined by measuring the volume of water required to fill the bottle. The measured amounts of CO₂ were corrected for the gas dissolved in the liquid phase. The results are expressed per gram of dry matter and hour (Simek *et al.*, 2011). Substrate induced respiration (SIR) was determined by measuring the CO₂ production from the soil samples incubated in serum bottles for 3 h after addition of glucose. Field-moist soil sample (5 g, humidity 20 %) was added to 3 replicate serum bottles as described for the determination of BR in the previous paragraph, and 2 ml of a glucose solution was added to each bottle (4mg C g⁻¹). Bottles were sealed with butyl rubber stoppers, and incubated at 25 °C. After 2 and 4 h, a 0,5-ml sample of the internal atmosphere was analysed by gas chromatography (see previous paragraph). SIR was calculated from the CO₂ increase during the 2-h incubation period (4-2 h). The bottles were further processed as described for BR measurement (Simek *et al.*, 2011).

2.2 Mycorrhizal root colonization

Mycorrhizal root colonization was evaluated in root samples taken from root systems of experimental plants. Plant roots were stored before processing proper in the fixative solution FAA (ethanol 50 %, acetic acid, formaldehyde). Staining of roots by 0.05% trypan blue in lactoglycerol (Koske & Gemma, 1989) was used for the evaluation of mycorrhizal infection, and the percentage of root colonization by AM fungi was estimated microscopically by means of a modified slide method (Giovannetti & Mosse, 1980). Mycorrhizal colonization of roots was evaluated in all cases in five replicas from each repetition of soil sample.

2.3 Statistical analysis

Potential differences in the values of roots colonization and respiration activity were analyzed by one-way analysis of variance (ANOVA) in combination with the Tukey's test. All analyses were performed using Statistica 10 software. The results were processed graphically in the program Microsoft Excel 2007.

3 Results and Discussion

3.1 Basal and Substrate induced respiration

Soil respiration is an important component of terrestrial carbon cycling and can be influenced by many factors that vary spatially (Martin & Bolstad, 2009). Basal respiration is defined as a production of released CO₂ from the soil for a time without the addition any substrate.

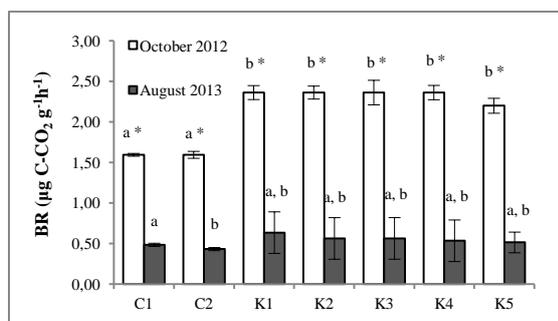


Fig. 2: Basal respiration (BR). Values are means and standard errors of three replications. Different letter indicate significant

difference in one period and * indicate significant differences in one variant (ANOVA, P < 0.05).

Figure 2 presents results of basal respiration. We can see that CO₂ production is significantly higher at the beginning of the experiment. After one year of the experiment BR decreased three to four times. Addition of compost at the beginning of the experiment significantly increase BR. On the other hand increased dose of compost did not increase CO₂ production.

Substrate induced respiration method uses the soil organism's physiological respirations reactions to substrate addition, as a means of quantifying microbial biomass in soils. Microorganisms need mainly organic carbon in the form of soil organic matter for their development (Elbl *et al.*, 2013). The organic carbon (C_{org}) is a source of energy. Martin & Bolstad (2009) confirm influence of C_{org} content on soil respiration.

Beesley (2014) confirmed that addition of compost increased respiration activity. But this activity decrease during the time (it is connected with the dose of compost and with the temperature of soil)

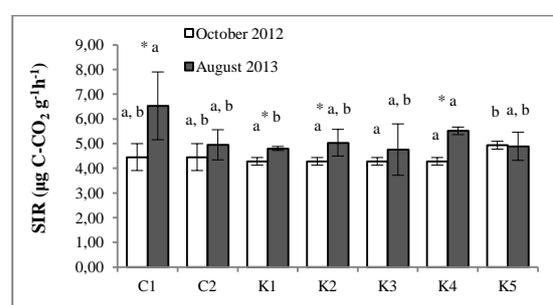


Fig. 3: Substrate induced respiration (SIR). Values are means and standard errors of three replications. Different letter indicate significant difference in one period and * indicate significant differences in one variant (ANOVA, P < 0.05).

The above figure 3 shows results of substrate induced respiration. After one year SIR increase (significantly in variants C1, K1, K2 and K4). But there were no major differences between variants in the same period.

3.1 Mycorrhizal root colonization

Importance of AM is evident - this symbiosis improves water and nutrient intake, reduces infestation of the host plant by root pathogens etc.

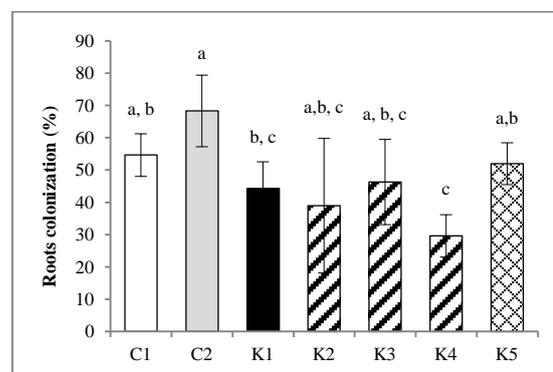


Fig. 4: Roots colonization of winter wheat by AM fungi. Values are means and standard errors of three replications. Different letter indicate significant difference in one period and * indicate significant differences in one variant (ANOVA, P < 0.05).

The above figure 4 shows differences between variants and roots colonization. You can see that combination of addition of compost and escalating dose of decrease roots colonization by

AM fungi. Azcón *et al.* (2003) and Stroblová *et al.* (2005) present confirm that high addition of nitrogen and phosphorus can have a negative effect on AM roots colonization. Stroblová *et al.* (2005) highlight that important factor for colonization of AM fungi is a type of cultivated crops.

The colonization of winter wheat roots by AM fungi varied of 30 - 68 %. The highest percentage of colonization was found in variant without the addition of fertilizers (C2). The lowest percentage of root colonization was found in variant with 100 % recommended dose of compost and nitrogen (K4).

4 Conclusions

Our lysimetric experiment showed the effect of different types of fertilization on respiration activity and roots colonization by AM fungi. Increased dose of compost did not demonstrate positive effect on roots colonization of winter wheat by AM fungi. The highest roots colonization by AM fungi was detected in variant without fertilization. Addition of compost significantly increase basal respiration, on the other hand nitrogen addition increase substrate induced respiration. Based on the results of selected biological properties is optimal to combine fertilization with compost and reduced doses of mineral fertilizers (especially nitrogen fertilizer). The reason is that compost is source of C_{org} and support development of microbial community and nitrogen (in mineral fertilizers) is a limiting factor for this development.

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Primary Paper Section: A

Secondary Paper Section: D, G, L

J INDUSTRY

IN	INFORMATICS
JA	ELECTRONICS AND OPTOELECTRONICS
JB	SENSORS, DETECTING ELEMENTS, MEASUREMENT AND REGULATION
JC	COMPUTER HARDWARE AND SOFTWARE
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JE	NON-NUCLEAR POWER ENGINEERING, ENERGY CONSUMPTION AND UTILIZATION
JF	NUCLEAR ENERGY
JG	METALLURGY, METAL MATERIALS
JH	CERAMICS, FIRE-PROOF MATERIALS AND GLASS
JI	COMPOSITE MATERIALS
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JK	CORROSION AND MATERIAL SURFACES
JL	FATIGUE AND FRACTURE MECHANICS
JM	STRUCTURAL ENGINEERING
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JS	RELIABILITY AND QUALITY MANAGEMENT, INDUSTRIAL TESTING
JT	PROPULSION, ENGINES AND FUELS
JU	AERONAUTICS, AERODYNAMICS, AEROPLANES
JV	COSMIC TECHNOLOGIES
JW	NAVIGATION, CONNECTION, DETECTION AND COUNTERMEASURE
JY	FIREARMS, AMMUNITION, EXPLOSIVES, COMBAT VEHICLES

REDUCTION OF PROCESS VARIATION USING STATISTICAL ENGINEERING

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Abstract: Statistical engineering is known as a discipline integrated within existing problem solving methodologies such as Six Sigma or Shainin for several decades. Recent effort to formalize the statistical engineering as a discipline and to establish statistical engineering as quality improvement methodology is significant. This paper summarizes the relation between statistical engineering and existing improvement methodologies – Lean Six Sigma and Shainin Red X[®] - as well as the contribution of statistical engineering to monitoring and improvement of the process variation. The wide deployment of the problem solving methodologies led to the lack of statistical thinking. The deployment of the statistical thinking by the integration of the statistical engineering system into the Lean Six Sigma or Shainin hierarchy could be a solution which would lead to better utilization of the statistical tools and more effective problem solving.

Keywords: Statistical Engineering, Shainin, Shainin Red X[®], QPDAC, Lean Six Sigma, quality improvement, problem solving.

1 Statistical Engineering

The effort to formalize statistical engineering as a discipline started in first decade of new millennium (Hoerl, 2010) and brings several interesting discussions about the definition, scope and purpose of the new discipline. Surely the statistical engineering was the part of the quality improvement methodologies before the formalization started. Searching in the literature we would find the statistical engineering as the discipline mentioned in the statistical and quality literature from 1940s. Quality improvement methodologies widely applied to solve the industrial problems – Lean Six Sigma and Shainin Red X[®] - are based on the statistical approach. Wide introduction of quality improvement methods brought on the development of user-friendly statistical software and the responsibility for the statistical analysis moved from statisticians to problem solvers. A problem solver is typically an engineer, an expert in a technical discipline who went through an intensive statistical training program. It means the statistical work is nowadays performed by non-statisticians particularly in case of routine tasks. This is called “democratization of statistics” (Hoerl, 2010 (2)). In the past statistical engineering was seen as a consultant job done by statisticians to advise, guide and assist other disciplines to plan experiments and tests, to plan the data collection and to evaluate data. This is not the case recently because of democratization of statistics.

Why is there a need to define or re-define the statistical engineering? Democratization of statistics could lead to the situation the deep analysis of data is not performed properly in terms of content and context of the data. On the other hand the interpretation of the data would not be beneficial without deeper analysis of the process which produced the data. It is obvious a successful problem solver understands statistics as well as an engineering discipline. It seems to be a contradiction. There could be two ways to overcome this situation: an integration of engineering knowledge and problem solving tools into the profession of statistician or to integrate statistical thinking with statistical methods and tools into the problem solving methodology.

Integration of engineering knowledge and problem solving tools into the profession of statistician would lead to the definition of statistical engineering as an improvement methodology. Typical problem to be solved by such methodology have following attributes: high degree of complexity with no known solution of the problem, high impact to organization, more than one statistical technique is needed to find a solution (typically statistical and non-statistical), a solid theoretical foundation is required to perform problem solving steps. The concept of statistical engineering for problem solving consists of four blocks (Snee, 2011):

1. Defining the problem, objective or concern.
2. Identifying the stakeholders involved in and affected by the problem.
3. Creating a strategy and high level approach that will be used to provide structure to the problem.
4. Establishing initiatives (tactics) for implementing the strategy that is unique to the problem.

The difficulty is the scope of the statistical engineering problem matches the scope of the typical problem to be solved by Lean Six Sigma or Shainin Red X[®]. One definition of statistical engineering says simply “Statistical engineering is a special marriage of engineering and statistics applied to solving technical problem” (Shainin, 1993). This definition fits to most common application of the statistical engineering within improvement activities represented by Six Sigma and Shainin Red X[®]. We can dispute these are the methodologies which are bringing the democratization of the statistics. The missing link is statistical thinking.

The aim of this article is to show the contribution of the statistical engineering to quality improvement and the deployment of the statistical thinking within existing improvement concepts. The quality improvement in most cases is equal to reduction of process variation therefore the link of statistical engineering to following methodologies will be discussed: statistical process control, improvement of high-volume manufacturing processes and problem solving methodologies – Shainin as well as Six Sigma.

2 Methodologies for reduction of process variation

2.1 Statistical process control

Statistical process control is preventive tool of quality management as the early detection of the significant process deviations from the upfront defined level allows realize appropriated process adjustments. The goal is to keep the process on required and stable level as well as continuously improve the process (Tosenovsky, 2000). Statistical process control itself is not the tool to reduce the variation. The goal of statistical process control is to monitor process variation using statistical tools. SPC distinguishes variability caused by random causes (the process is considered to be statistically stable) from variability caused by abnormal assignable causes (the process is considered not to be statistically stable) (Tosenovsky, 2000). Although SPC is quite well-known technique (SPC is part of the 7 basic quality tools), the SPC application is in many cases intended to fail. The key point of the SPC utilization is analysis of variation. If the analysis is not performed continuously (as part of the standard process evaluation process) SPC application will turn to creation of graphs which are just archived without a benefit. The responsibility for correct application of SPC starting from selection of the relevant chart, calculation of the control limits as well as warning limits to proper interpretation of the results is typically part of the quality engineering job.

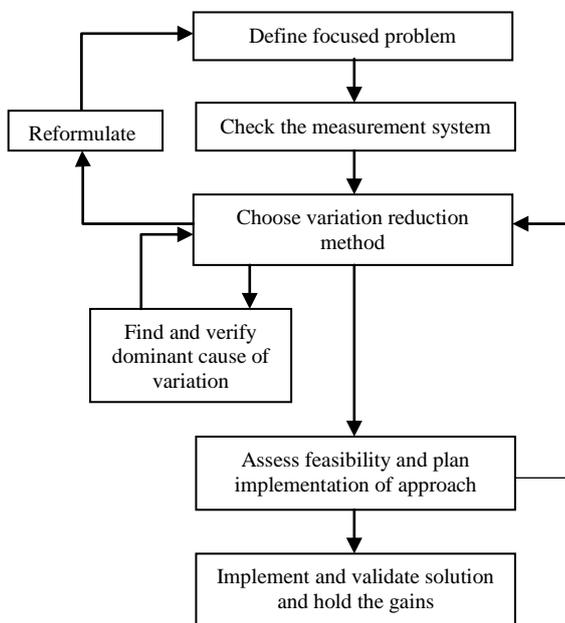
The role of statistical engineering is recently seen in the other area of SPC application: the implementation of the real-time SPC systems. One of the definitions says: “statistical engineering is defined as the study of how to best use statistical concepts, methods and tools, and integrate them with IT and other relevant sciences to generate improved results” (Hoerl, 2010). The application of the SPC especially in high-volume manufacturing requires the implementation of the real-time SPC system which collects data online from the production processes and creates the SPC charts automatically. The output of such system is usually connected to visualization and production systems as Jidoka and Andon. On the other side the real-line SPC system can be used as the base for identification of problems – both chronic and urgent – as well as for decision making process on different management levels. Statistical

engineering has to play new role as the SPC implementation is more focused on the preparation phase: selection of the proper software, definition of the data interfaces and connection to production systems (Jidoka, Andon, EPC - engineering process control, MES – manufacturing execution system). The analytical phase is performed as SPC driven manufacturing analysis rather than pure statistical analysis of the data. This approach to SPC analysis requires the knowledge of both - the statistics and the related manufacturing processes.

2.2 Improvement of high-volume manufacturing processes – Statistical Engineering

The algorithm for reducing process variation called Statistical Engineering (Steiner, 2005) is a framework for the application of statistical engineering within a problem solving methodology. The algorithm (Pic. 1) was designed to solve long-term repetitive problems on high- and medium-volume manufacturing and assembly processes. To use the algorithm properly requires the combination of the statistical knowledge as well as empirical knowledge about the concerned process. It means to learn about process by observation and experimentation.

Picture 1 Statistical engineering algorithm (modified from Steiner, 2005)



The framework of Statistical Engineering- QPDAC - is used to plan and execute the related investigations:

- Question – develop a clear statement what we are trying to learn
- Plan – determine how we will carry out investigations
- Data – collect the data according to plan
- Analysis – analyze the data to answer given question
- Conclusion – draw conclusion about what has been learned

The algorithm classifies seven methods for variation reduction:

1. Fixing the obvious based on knowledge of a dominant cause. This method requires team who has sufficient knowledge about process to determine an obvious solution. The availability of obvious corrective action depends on the knowledge of the process strongly. Team has to be confident the obvious solution is feasible, the possible side effects and costs has to be taken in account.
2. Desensitizing the process variation in a dominant cause. Desensitization will not eliminate a dominant cause. The goal is detect a process input which will reduce the sensitivity of the relationship between dominant cause and related process output. In this case the decision is to live

with the dominant root cause but the effect of the dominant root cause is reduced.

3. Feedforward control based on a dominant root cause. A feedforward controller is used reduce the effect of the detected dominant root cause. The basic principle is the measurement of the cause, prediction of the output and comparison of the predicted output value to the target. If the predicted value deviates from the target out of a specified range the process adjustment will follow.
4. Feedback control is based on the prediction of the process output based on the trend of previously measured output values. The feedback control is particularly effective in case of time-to-time output variation. The adjustment of process centre follows in case of an unacceptable deviation of predicted process output value to the target.
5. Making the process robust to cause variation. To make a process robust means to reduce the effect of the unknown dominant cause by the change of the fixed inputs. The DOE (Design of Experiments) methods are used to detect relevant inputs and evaluate related effects to unknown dominant cause as well as level of the process variation. Recently not only optimized inputs but also the noise factors are taken in account to design robust processes as the noise factors may have big influence to the process outputs (Tosenovsky, 2013). The noise factors cannot be adjusted.
6. 100% inspection. This is the simplest and most controversial approach. We are simply talking about comparison of the output value of each production unit to the inspection limits. The units out of the limits has to be reworked, repaired or scrapped. It is important to not use specification limits for 100% inspection as the specification limits are usually customer related. The inspection limits for 100% inspection has to be tighter.
7. Moving the process centre closer to target. This method is applicable on processes which were detected as off-target mean value of process. The goal is to define a way to move the mean of a respective process characteristic closer to the target value. Generally the target could be to move the mean to any direction within a specification limits depending on the target value. There are surely processes where the target value requirements are specified as higher or lower is better. The application of this method demands the identification of an adjuster: the process input that influence the output.

The aim of the root cause investigation is to find a dominant root cause. This is the approach similar to Shainin Red X[®] methodology. The first three methods mentioned above cannot be applied without dominant root cause being identified. The last four methods represent the effective solutions in case the root cause is not known or there is several contributors causing the variation. These methods are based on elimination of symptom rather than root cause. We can state the methods based on the elimination of the dominant root cause are more efficient but the methods listed as last four are widely used in the real industrial world. At the end the goal is to define the cost-effective solutions to reduce the process variation by increased knowledge of process. Selection of the variation reduction method leads to effective and efficient solution.

2.3 Shainin Red X[®] methodology

The Shainin Red X[®] methodology was developed by Dorian Shainin in from 1950s to 1990s. The basic concept can be summarized by 6 statements:

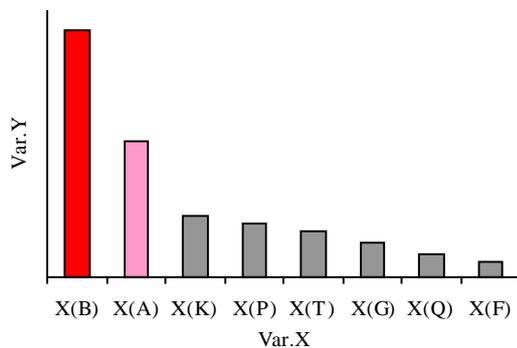
- Variation exists in all processes
- Understanding and reducing variation are keys to success
- In the real world nothing happens without a reason
- There is always a dominant root cause (called RedX[®] in Shainin terminology)
- Finding and controlling the Red X[®] is the only way to reduce variation
- Executing a progressive search by “talking to the parts” is the best way to find the Red X[®]

Most of problem solving methodologies use divergent approach: X to Y, from input to output. It means the first step is to study symptoms and then in the next step the relation of inputs to outputs is assessed using an empirical knowledge of the process or product. Typical output is the list of potential causes gained out of Ishikawa, brainstorming and an engineering analysis. It usually leads to the situation symptoms are understood but failure mechanism not. Root cause hypothesis assumes the combination of several possible contributors but the identification of the real dominant root cause is missing.

Shainin Red X[®] methodology uses convergent approach Y to X, from outputs to inputs. What does it mean? It is absolutely necessary to understand the output of the process – the Green Y[®]. No problem can be solved without knowledge of the output, distribution of the output values, detail knowledge of the product and related manufacturing process, symptoms of the failure as well as difference between good and bad parts. This is ensured by approach which is described as “talking to parts”, the progressive search methodology based on elimination of suspects, comparison between good and bad parts, finding extremes and contrasts.

The key idea of Shainin Red X[®] methodology is Red X[®] paradigm. This paradigm is coming out of the application of the Pareto principle to the causes of the variation (Pic. 2). By application Pareto principle you would get contribution of the Xs (process inputs) to the ΔY (increment of the output) as shown on Pic. 2. The Red X[®] is dominant root cause. It does not mean it is the only root cause. The Red X[®] is the strongest root cause. Following the logic of Shainin Red X[®] concept there could be maximum three causes identified – two additional called Pink X[®] and Pale Pink X[®] - which are usually in the interaction with Red X[®].

Picture 2 Red X[®] paradigm



Source: www.shainin.com

The identification and control of Red X[®] is the key result which will bring process improvement. Once the Red X[®] is identified the determination of a mathematical model in the form of $Y=f(X)$ is not necessary. In fact, it would be unproductive to look for the relation. We would spend too much time to determine relationships which are already controlled.

Shainin problem solving roadmap is called FACTUAL[™] (Focus, Approach, Converge, Test, Understand, Apply, Leverage) is shown in table 1. (Hysong, Shainin and Six Sigma). Shainin Red X[®] methodology is particularly strong in the diagnostic journey, it means in phases Focus, Approach, Converge and Test. The usage of the right tools is driven by strategy, strategy which is defined as the outcome of the Green Y[®] analysis at the beginning of the problem solving project and which is continuously updated after each step.

What is actually the role of a statistical engineer within Shainin Red X[®] concept? The answer is simple: problem solving. Problem solving which can be expressed in three steps: study symptoms, identify the root cause and propose a solution. Shainin techniques are statistically simple, graphical analysis is

preferred and keeps the statistics in the background. This allows an engineer to keep focus on technical background of the problem and critical relationships.

Table 1 Shainin roadmap: FACTUAL[™]

Focus	<ul style="list-style-type: none"> ▪ Leverage probable events ▪ Project Definition ▪ Estimate the impact
Approach	<ul style="list-style-type: none"> ▪ Green Y[®] Identification and Description ▪ Development of Investigation Strategy ▪ Measurement System Verification
Converge	<ul style="list-style-type: none"> ▪ Converging on the Red X[®] ▪ Compare best and worst case ▪ Red X[®] Candidate Identification
Test	<ul style="list-style-type: none"> ▪ Risk Assessment ▪ Red X[®] Confirmed by Trial
Understand	<ul style="list-style-type: none"> ▪ Green Y[®] to Red X[®] Relationship Understood ▪ Optimization of interactions ▪ Customer needs translated to limits ▪ Appropriate Tolerance Limits Established
Apply	<ul style="list-style-type: none"> ▪ Corrective Action Implemented and Verified ▪ Procedures updated ▪ Green Y[®] monitoring ▪ Project Benefits and Cost Savings
Leverage	<ul style="list-style-type: none"> ▪ Read Across Red X[®] Control ▪ Savings Calculated ▪ Lessons Learned

2.4 Lean Six Sigma

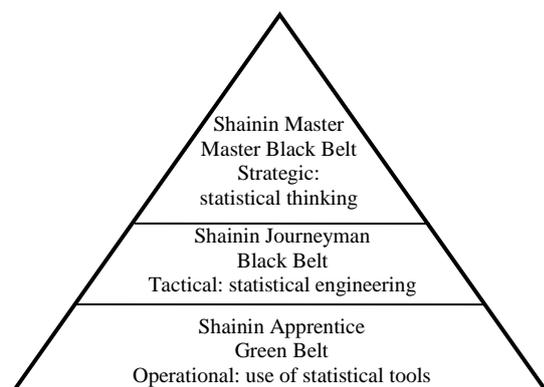
Lean Six Sigma is a managerial concept combining Lean and Six Sigma approach which was first published by Michael George in 2002 (George, 2002). Lean Six Sigma combines the Six Sigma DMAIC (Define, Measure, Analyse, Improve, Control) concept and Lean tools in the methodology which aims to improve quality and efficiency of the process. Defects are considered as waste in the Lean concept. Target of Lean Six Sigma is a sustainable improvement of quality, elimination of waste, decrease of costs, improved metrics and introduction of the change in company culture.

Shainin Red X[®] concept insists on application and regular update of problem solving strategy while Six Sigma is rather wide collection of the tools which can be used within DMAIC framework. The usage of the related statistical tools within Shainin is determined by strategy, Six Sigma allows problem solver to using variety of the statistical and non-statistical tools. This could be on one hand an advantage of Six Sigma but it can become a big disadvantage in case of inadequate usage. This conflict is one of the reasons Six Sigma methodology is being criticized due to extensive demand of statistical knowledge.

While Shainin Red X[®] methodology is more focused on technical problem solving Lean Six Sigma can be applied across multiple business models. Six Sigma is very often used to solve large, complex, unstructured problems with high impact to an organization. Such problems could require effective application of statistical tools, at some point an integration of several statistical tools in case of high complexity would be necessary. This is in line with the recent definition of the statistical engineering. To solve the large, complex problems require team approach, creation of multidisciplinary teams. The question stays same: what should be the role of statistical engineer? The ongoing discussion about statistical engineering contains the point related to leadership of a statistical engineer. Taking in account the experience from industrial problem solving projects a leadership is in hands of an engineer experienced in technical area rather than a statistical expert. The missing link - insufficient statistical thinking - can be deployed within Six

Sigma structure. Snee defines the statistics and statistical engineering as a system (Snee, 2010). The combination of the statistical engineering system with well-known hierarchy of the Six Sigma belts is shown on Pic. 3. The statistical thinking can be deployed in direction from Master Black Belt to Black Belt and to Green Belt. The role of statistical engineer is overlapping with Black Belt role then. So the deployment of the statistical thinking and statistical engineering is actually related to the proper organization of the Six Sigma structure within an organization. This would allow an organization to select suitable candidates to the key positions (Master Black Belt/Black Belt) taking in account their education and knowledge base and plan an appropriate long-term training program to build sufficient knowledge in both statistical and technical area. The same approach could be established within Shainin following top-down hierarchy: Master, Journeyman, Apprentice (see Pic. 3).

Picture 3 Statistical engineering system built-in the Lean Six Sigma and Shainin hierarchy



3 Conclusion

Statistical engineering is currently being established as new discipline. One of the results of this effort should establish statistical engineering as a quality improvement methodology. The creation of the separate statistical engineering improvement methodology can be quite long journey. The quicker and more reasonable way to improve application of statistical tools is alignment of statistical engineering with existing concepts— Lean Six Sigma and Shainin Red X[®]. The contribution of statistical engineering to monitoring and improvement of the process variation is significant and brings the results: the algorithm for process variation reduction proposed by Steiner and MacKay (Steiner, 2005) or the long successful history of the Shainin Red X[®] application in the field of industry could be taken as evidence of that. For sure there are other fields which would require the attention of the statistical engineer in the future as Statistical Process Control or an improvement of statistical toolkit within Lean Six Sigma. It is clear the position of the statistical engineering changed in last decades. The statistical analysis is performed by non-statisticians largely which is related to wide deployment of the improvement methodologies. This could lead to lack of statistical thinking as side effect. This can be solved by the integration of the statistical engineering system into the Lean Six Sigma or Shainin hierarchy which would bring the new role of statistical engineering in the area of the problem solving and the support of problem solving activities.

Note: Red X[®], Green Y[®], FACTUAL[™] are legally protected marks of Shainin LLC.

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Primary Paper Section: J

Secondary Paper Section: JS

