BUSINESS AND NON-PROFIT ORGANIZATIONS FACING INCREASED COMPETITION AND GROWING CUSTOMERS' DEMANDS

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INTRODUCTION

We live in a world consisting of organizations. Every man throughout his or her life is involved in various organizations and has to deal with them as owner, shareholder, entrepreneur, manager, employee or customer (consumer of goods or services offered by the organization). Therefore, conducting continuous research into these organizations should be considered imperative. These studies should aim, on the one hand, to indicate the new challenges posed by the organizations of the market economy and the characteristic of the intense competition and the increasing demands of consumers, the other to determine the terms and conditions for smooth functioning. Efficiency requirements are forcing organizations to have unique, difficult to copy, skills and competence and the use of modern, sometimes sophisticated management methods.

However, these studies should not lead to a rediscovery of known truths, but should focus on disclosure, description, and analysis of new phenomena and processes for the organization. The theory of organization and management should be the starting point for this research.

For our discussion, it is believed that the organization is structured, artificially created a social unit, which through the coordination of the activities and relationships of its members and resources (tangible and intangible) carry out the planned transactions with the environment, pursuing the aims of the creators and its members. From here you can deduce the thesis that organizations: they are artificial creations, deliberately created by the people to meet specific targets; they are properly ordered socio-technical systems; are open systems, consistently leading the exchange of matter, energy and information with the environment.

Due to the nature of the objectives pursued and rules of operation are divided into commercial and non-commercial organizations. The purpose of this monograph is to identify flowing from increased competition and growing consumer expectations the conditions of the commercial and non-

commercial organizations and determining their impact on them. On the other, the presentation of strategies and principles of operation used by the surveyed organizations and advocating adequate behavior of the organization, allowing to gain and maintain a competitive advantage.

Based on the analysis of the prepared articles you can indicate the following groups of issues that are currently important for the problem of commercial and non-commercial organizations and increased competition, as well as the increasing demands of consumers:

I. BUSINESS AND NON-PROFIT ORGANIZATIONS AS THE OBJECT OF RESEARCH
II. MODERN TOOLS FOR BUSINESS AND NON-PROFIT ORGANIZATIONS MANAGEMENT
III. FINANCIAL ASPECTS OF ORGANIZATIONAL MANAGEMENT
IV. BUSINESS AND NON-PROFIT ORGANIZATIONS – GLOBAL AND REGIONAL ASPECTS

Such a structuring issue will be the basis for the design of this study. We wish to express gratitude to the Authors of these articles, whose contributions shaped this monograph. We also thank all the Reviewers for their willingness to share their expert knowledge and experience with the Authors, along with substantive support. We believe, this commendable effort and cooperation results in attention to the high quality of the publication.

Adam Nalepka, Anna Ujwary-Gil

I.
BUSINESS AND NON-PROFIT ORGANIZATIONS AS THE OBJECTS OF RESEARCH

THE CREATION OF PROCESS ARCHITECTURE IN A MUNICIPAL COMPANY

Janusz Adamek[1], Krzysztof Głuc[2], and Natalia Potoczek[3]

Abstract
The article deals with legal and economic sources of process re-orientation of a municipal company. In case of municipal activity it is not the competition but the quick growth of investment that forces business entities to verify their business models. The growing costs of maintaining and implementing public services force the growth of managerial competencies and the search for better organization methods. The case study of the Nowy Sącz Water Company presented in the article is an example of changes occurring in the area of organization and management of public utilities. The process re-orientation creates possibilities of improving the business model and, inter alia, increasing the value provided to customers by more efficient management.
Keywords: *public utilities, water company, business model, business processes, process architecture.*

1. Introduction

The changes in the public utilities sector occurring in the first decade of the 21st century were mostly connected with the investment activity co-financed with the EU funds. The development of public utilities infrastructure quickly brought improvements to the quality of living by increasing accessibility and quality of public utilities services, but also led to increased production costs and consequently – price growth. Public means obtained by Poland since its accession to the European Union significantly affected the scope, range and quality of public utilities services offered to customers. This means that municipal entities increased the numbers of their customers and are able to offer more services and increase their value through higher quality and attractive prices.

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Expenditure on infrastructure allowed to obtain the "economies of scale" effect, but simultaneously they burdened business entities with high maintenance costs. Currently public utilities entities face a serious challenge of optimizing their activities, mostly to maintain the acceptable level of prices for the services they provide.

A natural consequence of the above is the search for a proper business model which will let public utilities companies accomplish their goals set for them by their supervising local government organs. Public utilities entities are not burdened with competition mechanisms, but they are accountable for proper allocation of public resources. Legal regulations determine the level of responsibility and determine terms on which delegated tasks should be accomplished, but they do not impose concepts or methods of management which should be applied in public utilities management. This aspect of business entities' activity in public utilities economy is related exclusively to managerial competencies of local authorities and managers.

Referring to the perspective of changes occurring in the management practice in the past two decades it seems justified to make an attempt at re-orienting business entities in order to improve the efficiency of the activities. Since the 1990s, thanks to strong development and common availability of information and communication technologies, the development strategy, as well as on greater efficiency in the implementation of business processes. Bigger and small businesses, equally affected by the global economy, undergo process re-orientation in management, mostly in order to obtain greater control over their resources and activities. The goal of the article is to present the activities of the Nowy Sącz Water Company (Polish abbreviation: SWNS) which were taken to implement process re-orientation. The company is still operating within the functional system, however, being aware of its current and future constraints, it attempted at creating a new architecture for the organization, transforming the organizational structure and developing a new management system supported with proper IT tools.

2. Research questions and methodology

The Polish public utilities economy faces an enormous challenge of optimizing costs as a result of public utilities development, growing expectations of customers and significant growth of assets, especially construction and technology infrastructure. Taking into account the organizational changes observed in business it seems obvious that public utilities entities also have to take care of better organizational efficiency. This is why the widespread concept of process reorientation has also become popular in this sector of the economy.

Public utilities companies usually operate on the basis of a business model they have developed for years. Their privileged monopolist position made their static business model good enough to determine directions of activities or principles of market participation. A fundamental question arises, whether it is possible to shape the process architecture based on a business model. If we relate to the contemporary concepts of a business model and standards of process modeling, it seems justified to assume that the starting point should be to define the basic value chains by key elements of the model.

Creating the process architecture of an enterprise is one of the first and key stages in designing the process reorientation. In the analyzed SWNS an attempt was made at creating the process architecture based on the business model developed by Osterwalder and Pigneur (2005) and the model of business processes contained in the international standard developed by APQC association (*American Productivity and Quality Center*). The main research goal was to find an answer to the following question: Will the combination of the business model of the Company and the identified processes according to the APQC standard facilitate the creation of process architecture in the organization? The research was conducted at the SWNS, which initiated some activities towards process reorientation in management.

3. Legal and economic determinants of the operations of a municipal company

The current condition of the municipal economy is the outcome of the self-government reform initiated in 1990 when municipalities were established as basic self-government units on the local level. Within the next years the model of economic and municipal activity was developed. The valid legal act regulating the activity of municipalities in this scope is the Act of 20th December 1996 on Municipal Management, which defines the economic system of municipalities (Act of 1996). In its first article, the Act determines the principles and forms of municipal management of territorial self-government units, consisting of performing their own tasks in order to satisfy collective needs of the self-government community.

The recommended forms of municipal economy are self-government utilities and commercial law companies. It is also allowable to delegate the municipal tasks to individuals, corporate bodies or organizational units which do not have the status of a legal person (subject to reservations listed in Article 3.1, Act of 1996). The municipality, constituting the lowest self-government level, performs the widest scope of tasks related to satisfying social needs and thus conducting economic activity. It should be emphasized that the constituting organs of territorial self-government units (municipal

councils, district councils, province parliaments) take decisions in the form of resolutions on the choice of the way of conducting the public utilities activity.

The activity of a municipal company in form of a self-government budget unit is financed with its own revenues from performed services. It can be supported with self-government unit budgetary means in the form of object, purpose and subject subsidies. Commercial law companies can be established by one entity – as sole shareholder companies of self-government units, or by several entities, for example by some municipalities. Such companies then have the status of a legal person and their own assets. The Polish public utilities sector is dominated by limited liabilities companies and joint stock companies. Territorial self-government units which own the shares in these companies may manage the activities of the established companies by passing resolutions. There are also public-private municipal ventures, for which capital companies, limited partnerships and limited joint-stock partnerships are established, on the basis of the Act of 19th December 2008 on public – private partnership (Act of 2008). Another form in which municipal tasks are accomplished is non-profit associations which may be created in cooperation with some self-government entities, also of various municipal, district and province levels.

The Polish self-government system entrusts the municipalities with the biggest number of public utilities tasks. A vital factor determining the public utilities management is the possibility of public forms of cooperation granted by the lawmakers. The Act on the municipal self-government (Act of 1990) and the Act on the district self-government (Act of 1998) allow to create inter-municipal and inter-district associations in order to perform public tasks together. There is a possibility of establishing institutional forms of cooperation in the shape of public utilities associations, which may be given the status of a legal person. In practice a constituting and supervising organ for an inter-municipal association is the meeting of partners established by heads of municipalities. Similar organizational solutions are used on the district level. Public utilities associations may be established independently or with the participation of other public entities or private commercial law companies or foundations in order to manage public utilities.

The cooperation between municipalities in public utilities services is particularly justifiable in case of water and waste management. Water extraction, processing and distribution, as well as waste collection and purification requires investments that often go beyond the capabilities of single self-government units. The creation of a network infrastructure and the use of technologies allowing to meet various requirements often exceeds the capabilities of municipalities, especially those with a small population that is spatially dispersed.

Self-government units may also sign agreements without the necessity to establish separate entities, granting the performance of public tasks to other municipalities or districts which have sufficient resource and technology potential. Units which grant their tasks to be performed by other municipalities are obliged to participate in the costs of performing them.

4. The business model at the Nowy Sącz Water Company

According to the main assumption of the authors of Business Model Canvas concept, the starting point in constructing a model is to determine the values the company may deliver to clients. The main goal of the water company is to provide water and to collect waste through its water and sewage network. For clients, however, the essence of the transaction lies not only in the supply of water and collection of waste but also in the terms on which these services are provided, especially for those clients who have decided to join the network and resign from their own, home water uptakes and sewage treatment plants. The Company guarantees, first of all, regular supply of high-quality water and regular collection and treatment of waste. Acting in accordance with the Water Management Law, the Company ensures it uses technologies and meets the norms guaranteeing the appropriate standard of water processing and sewage treatment. It is nearly impossible for individual inhabitants to achieve the same level of quality when they process water and treat waste on their own. Technology and competence barriers make the use of the water network not only more comfortable but also cheaper. Among the values delivered to external clients one can list many related to the activities supporting the accomplishment of the main processes, for example conducting laboratory tests, renting construction and transport equipment, sale of water meters, sale of energy, providing processed water in specialist vehicles, sale of water and sewage system materials. The Company owns its own infrastructure but also services water and sewage networks and related objects belonging to shareholders – municipalities.

The proposed values are received by two main segments of clients: individual clients, inhabitants of municipalities – shareholders, and institutions (commercial and non-commercial organizations) conducting their activities in the area of the above municipalities. The own water and sewage networks and those belonging to municipalities are the main channels through which water and sewage are distributed. Analyzing the key relations with clients, we should present the detailed division of segments into individual and institutional recipients of water and individual and institutional providers of waste. Contacts with each group of clients are maintained either via batch or individual correspondence or through individual contacts of customer service

center staff or Board Representative for Field Matters with local media, and within the Aquarius Academy directed mainly at schools run by self-governments of the municipalities – shareholders.

The sales of water and collection of waste via the network currently account for 98% of the revenues from all services provided by the Company. The remaining revenues come from the services offered within the auxiliary activity. Both fixed and variable fees are determined in the annual tariff, created on the basis of the Act of 07th June 2001 on Collective Water Provision and Collective Waste Collection and the Regulation of the Minister of Construction of 28th June 2006 on determining tariffs, a sample application for tariff confirmation and terms of settlement for collective collection of waste. The main assumption in shaping prices is to maintain the lowest possible level which nevertheless guarantees the water and sewage company can maintain its operations. In practice, with the current water extraction level, applied technology, established infrastructure and contracted loans for the implementation of the investment co-financed with EU funds, it is possible to maintain the acceptable level of prices and at the same time engage the budgetary means of the partner municipalities.

The key Company resources are most of all assets necessary to conduct business activity. According to the definition included in International Accounting Standards (IAS), assets are resources controlled by a company as a result of past events, from which it expects the inflow of future economic benefits to the enterprise. Company assets are most of all physical assets covering the whole construction infrastructure of the network, network buildings, plant buildings, technological infrastructure in the water processing plants and the sewage treatment plant, equipment, car fleet. Human resources are a vital resource of the Company, namely everything that people bring to the Company: their knowledge, skills, abilities, creativity, involvement, and availability. Non-tangible assets also include the brand developed by SWNS for over 100 years of its activities. Key financial resources include liabilities, that is all sources of financing, mostly profits generated by the Company, loans, and bonds.

The key activities of the Company are directly related to developing products and offering services to clients. The main value chain always comprises activities related to water extraction and treatment, providing water to clients, collecting waste, waste treatment and sales and financial servicing of clients. The company activities so far have been conducted along the functional orientation in management, tasks of particular cells have been grouped in three departments, and recently (2016), in the transition period, in two departments. Both main and auxiliary activities were dispersed in tree or two departments. Currently, the Company is working on streamlining its

Table 1. The business model of SWNS

<table>
<tr>
<td rowspan="2">Key partners
Construction work sub-contractors
Suppliers of materials
Board consultants
Construction designers
Scientific research centers
Sector associations
Chamber of Commerce – Polish water Systems</td>
<td>Key activities
Water extraction and processing
Waste purification
Water and waste distribution
Exploitation of water and sewage network
Investments and modernizations
Licenses, regulations, tariffs
Regulations and contracts with clients
Participation in tenders
Organization of tenders</td>
<td rowspan="2">Values for clients
1. Regular, convenient supply of high quality water
2. Regular, convenient collection and treatment of waste</td>
<td>Key relations with clients
Correspondence with clients: paper, e-mail
www. swns.pl ; FB
Personal relations
Direct relations with municipalities maintained by Board Representative
Contacts with media maintained by Promotion Specialist</td>
<td rowspan="2">Key segments of clients
1. Individual clients – water recipients
2. Individual clients – waste providers
3. Institutional clients – water recipients
4. Institutional clients – waste providers</td>
</tr>
<tr>
<td>Key resources
Infrastructure: 3 water extraction and processing plants, water and sewage network with buildings, sewage treatment plant, administration buildings, warehouses, car fleet, technical equipment
Human resources
Financial resources: Loans, bonds
Client bases, IT resources
Brand/trust</td>
<td>Key channels
Water and sewage network belonging to the Company
Water and sewage networks belonging to municipalities</td>
</tr>
<tr>
<td colspan="3">Costs structure
Direct costs: water production and supply, waste collection, treatment, costs of other activities
Indrect costs: costs of management, costs of auxiliary activities</td>
<td colspan="2">Revenue flows
Fixed fees for water and waste
Variable fees for water and waste</td>
</tr>
</table>

Source: Based on Osterwalder & Pigneur (2010, pp. 19-48).

activities along the process orientation, which is supposed to bring greater efficiency of operations, quicker decision-taking and lower operational costs. The key supportive activities include investment and renovation activities, obtaining and maintaining licenses, creating regulations of water provision and waste collection and other activities supporting production, creating tariffs, signing contracts with clients, participation, and organization of tenders for procurement of materials and services.

Conducting such complex activity requires strong external support. Investments and renovations call for cooperation with external entities, both construction companies and such specialists as geodesists, designers, construction inspectors, surveyors, etc. The Company regularly cooperates with suppliers of water and sewage materials. The range of managerial issues dealt with by the Company makes it necessary to hire consultants – specialists in law, financial management, management systems and processes. The Company participates in the activities of various sector associations and projects implemented in cooperation with scientific research centers, thanks to which it has access to knowledge and can develop new competencies. One of the most important institutional partners is the Chamber of Commerce – Polish Water Systems.

The cost structure should reflect particular elements of the business model. The current costs analyses relate to the division into direct costs, associated with the core activity of the Company and additional services provided by it. Indirect costs cover costs of management and costs of auxiliary activities. This area is less transparent and difficult to examine at present. It is assumed that proper identification of supporting processes should help precisely identify indirect costs. Proper process management should also allow the Company to optimize fixed costs and to achieve greater predictability of variable costs. The current business model relies on effects obtained from economies of scale, with the high potential of the Company at present it is advisable to develop the existing segments of clients, that is individual and institutional clients connected to the network. The current activities related to obtaining benefits from the scope of such activities as laboratory tests, equipment rental, have not increased the Company revenues significantly. It is possible, however, that the business model may be changed due to the appearing possibilities of using the network in order to distribute other values.

5. The use of the business model in creating the process architecture

The creation of process architecture is associated with the individual choice made by the enterprise. However, companies more and more often use standards developed either by international organizations (associations,

consulting companies, scientific centers) or by producers of software supporting process management. It is widely accepted that processes are classified into two groups: business processes (core, economic, operational) and supporting processes (supporting, auxiliary). Some classifications also include managerial processes. In practice, we often observe the phenomenon of identifying process architecture with the map of processes in an organization. Many scientists, however, point out that the creation of process architecture is a very complex and onerous process. Harmon (2007) identifies a few key steps that need to be made when designing process architecture of an organization:

- identifying proper value chain,
- determining proper strategic goals which will be supported in the value chain,
- determining how to examine whether strategic goals are accomplished in the value chain,
- dividing the value chain into main processes, main processes into sub-processes, in order to build the hierarchy of processes,
- determining how each process from the first level will be measured, who will be responsible for it and what resources are needed to accomplish each process,
- repeating the procedure for each next level of processes.

Jeston and Nelis (2008) inspired by the works of Wagter, van den Berg, Luijpers and van Steenbergen (2002) developed a list of attributes of a good process architecture. An important assumption made by the above authors is the recognition of a dynamic nature of process architecture. Therefore process architecture:

- must be a collection of rules, principles and models of processes,
- must constitute the basis for designing and implementing processes of an organization,
- processes must be related to the goals and strategies of an organization,
- processes must be aligned with business architecture, information and technical architecture, which make up the architecture of the whole enterprise,
- processes must be easy to understand and apply by all stakeholders,
- process architecture must be dynamic, easy to adopt developing processes, business and changes in the enterprise.

The use of international standards offers a special benefit of making comparisons or using sector standards. One of the best known standards is the PCF model (*Process Classification FrameworkSM*) developed for nearly two decades by APQC association. The PCF model has been shaped by the experiences of APQC member companies in process management. The APQB database[4] covers over 1000 operational and support processes. The PCF project

4 Retrieved from APQC database, www.apqc.org/pcf

involves over 80 organizations from various sectors. The model is continuously updated, processes and activities are added and the process structure itself is subject to changes. The tables below (Table 2, Table 3) present twelve groups of processes, five of which relate to operational processes, while the other seven to supporting and managerial activities.

Table 2. Process Classification FrameworkSM (PCF) 6.1.1.

Operating processes				
1.0 Develop Vision and Strategy	2.0 Develop and Manage Products and Services	3.0 Market and Sell Products and Services	4.0 Deliver Products and Services	5.0 Manage Customer Service
Management and support services				
6.0 Develop and Manage Human Capital				
7.0 Manage Information Technology				
8.0 Manage Financial Resources				
9.0 Acquire, Construct, and Manage Assets				
10.0 Manage Enterprise Risk, Compliance, Remediation, and Resiliency				
11.0 Manage External Relationships				
12.0 Develop and Manage Business Capabilities				

Source: Retrievied from https://www.apqc.org/knowledge-base/download/313690/K05162_PCF_Ver_6.1.1%20final.pdf (accessed on: 20.12.2015).

Support and management processes were presented in groups of services, the name of the group reflecting their nature and role in an organization. Management and support processes provide services to staff implementing operational processes and all other processes (for example, in the case of services in human resource management). Management and support services have their own clients mostly inside an organization, the so-called internal clients.

Table 3. The interpretation of the numbers of levels included in PCF 6.1.1.

Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**
Categories	**Process Groups**	**Processes**	**Activities**	**Tasks**
10.0 Managing risk in an enterprise, compliance, adjustment and resistance of an organization	10.1 Managing risk in an enterprise	10.1.4 Managing a business unit and risk of the function	10.1.4.3 Developing a plan of limiting risk	10.1.4.3.1 Assessment of adequacy of insurance cover

Source: Retrievied from https://www.apqc.org/knowledge-base/download/313690/K05162_PCF_Ver_6.1.1%20final.pdf.

All the process groups in the PCF model were aligned according to five levels. Table 3 above presents the interpretation of the level numbers and order of processes and activities. The five-grade structure *(Category, Process Group, Process, Activity, Task)* included in version 6.1.1 allows us to compare the tasks completed within particular activities. We should notice that the proposed model of process classification relates to processes identified in practice, the higher the level of generalization, for example within categories and groups of processes, the greater usefulness it has in creating process architecture of an enterprise. More detailed proposals, starting from the process level to single tasks can only constitute an illustrative material for design work in organizations.

Table 4. The scope of tasks performed by Water and Sewage Network Plant

Water and sewage network plant - RS
The main goal of the Water and Sewage Network Plant is to ensure efficiency of the whole water and sewage network in the area covered by the activities of the Company in order to ensure a constant supply of water and collection of waste from the population. The accomplishment of the assigned goals and tasks is the responsibility of the Head of the Water and Sewage Network Plant, who directly reports to Strategy and Development Director.
RS comprises:
Processes of maintaining water and sewage network. • Organizing and conducting maintenance activity in the water and sewage network, bolts and hydrants and other appliances. • Removing the failures in the network in cooperation with the Department of Monitoring and Steering the Water and Sewage System. • Regular supplementation of the marking for water and sewage network development. • Cooperation with Department of Transport in organizing repair and modernization works. • Cooperation with Technical department in developing annual and section maintenance plans for the water and sewage network and plans for network overhaul. • Controlling the exploitation of the objects, water and sewage network appliances. • Organizing and conducting repairs of the appliances used by the Company. • Writing account of the materials used. • Writing timetables for shift work, monthly pay cards and technical emergency service timetables. Processes of developing water and sewage network. • Developing, jointly with Technical Department, plans for development or modernization of water and sewage network. • Cooperation with contractors of investments made by the Company in water and sewage network. • Liaising with the Department of Design Coordination when agreeing to technical conditions for connecting buildings to the city water and sewage network. • Preparing acceptance protocols so that the water and sewage network and connections could be taken over by the Company. • Participation in technical acceptances of the appliances and water and sewage network accepted for use. • Cooperation in developing a digital map of water and sewage network. • Registering and invoicing services of accepting water and sewage network and connections.

Source: Internal materials of SWNS.

The activities related to process classification at SWNS could only be taken up following the preliminary reformulation of the organization's rules and regulations. In line with classic models of documents created for functionally-oriented organizations, also the Company's rules and regulations contained sets of tasks subordinated to particular departments and organizational units. In order to develop process thinking and perception of work in process categories, the organization's rules and regulations were supplemented with the classification of activities according to performed processes. Firstly, the main goals of organizational cells were introduced. Secondly, tasks were grouped so that they could further be subordinated to proper levels of the PCD model structure. For example, the description of the tasks of the Water and Sewage Network Plant (Table 4) reflects the areas of tasks (main processes), participation in tasks or performing them individually, as well as other entities participating or responsible for processes. Such descriptions were introduced to the organization's rules and regulations which constitute a transition form before the final solution is achieved, developed specifically for the implementation of the new strategy of the company, directly aligned with the process classification adopted by the Company.

In order to identify the processes in the Company and create responsibility for the processes, we tied process groups in the PCF model to the functions of managers ultimately responsible for the process groups at SWNS (Table 5).

Table 5. Aligning processes to management functions at SWNS

Operating processes				
1.0 Develop Vision and Strategy	2.0 Develop and Manage Products and Services	3.0 Market and Sell Products and Services	4.0 Deliver Products and Services	5.0 Manage Customer Service
Strategy and Development Director	Production and Distribution Director	Managing Director	Production and Distribution Director	Strategy and Development Director

Management and support services	
6.0 Develop and Manage Human Capital	Managing Director
7.0 Manage Information Technology	Managing Director
8.0 Manage Financial Resources	Managing Director
9.0 Acquire, Construct, and Manage Assets	Strategy and Development Director
10.0 Manage Enterprise Risk, Compliance, Remediation, and Resiliency	Managing Director
11.0 Manage External Relationships	Strategy and Development Director
12.0 Develop and Manage Business Capabilities	Strategy and Development Director

Source: Internal materials of SWNS.

The goal is to implement the new organizational structure reflecting the conducted processes and the organization's regulations which will take

into account the new process structures and responsibilities for the processes performed in the Company.

Subordinating directors to particular process categories shows that one of the directors is responsible for all production and distribution processes, while others, including the Managing Director, are responsible for management processes and those that support the basic production and distribution activity.

The key activities included in the business model of the Company were classified as process category in the PCF model (Table 6). The presentation of the main activities in the business model of the Company and process categories according to the PCF model show from the very first sight that the company focuses strongly on uncreative activities. The activities associated with long-term planning and designing products have not been emphasized. The company enjoys a monopolist position, whereas its core activity is determined by long production cycles. The biggest challenge is the development and use of water and sewage networks.

Table 6. The classification of main activities according to process categories of the PCF model

Main activities included in the business model	**Process categories according to PCF**
Water extraction and treatment	*Deliver Products and Services*
Sewage treatment	*Deliver Products and Services*
Water and sewage distribution	*Deliver Products and Services*
Exploitation of water and sewage network	*Manage Customer Service*
Investment and modernization	*Acquire, Construct, and Manage Assets*
Licenses, rules	*Manage Enterprise Risk, Compliance, Remediation, and Resiliency*
Regulations, tariffs	*Market and Sell Products and Services*
Contracts with clients	*Market and Sell Products and Services*
Participation in tenders	*Acquire, Construct, and Manage Assets*
Organization of tenders	*Acquire, Construct, and Manage Assets*

Source: Internal materials of SWNS.

Customer service processes are mostly associated with broadly understood network exploitation that is network maintenance ensuring failure-free exploitation, but also removing failures, conducting repair, modernization and investment works. The key elements of the business model demonstrate where the water company focuses its attention. In our case these are production and distribution processes, network maintenance processes, legal adjustment processes in water and sewage management, as well as processes of shaping prices which, apart from economic calculation, also depend on the valid legal regulations and the current utilities policy implemented by territorial self-governments.

6. Conclusions

The application of a business model to create process architecture in a utilities company is of vital significance if we take into account management practices in utilities entities in Poland. Another important aspect in creating process architecture in an organization is the use of benchmarking. The article presents the PCF Model, which is currently used all over the world as a benchmarking model. Undergoing constant modifications, the model has been developed for several years and it has been gathering information from all over the world. Therefore it is considered to have become one of the most important standards in classifying organizational processes. The combination of the business model and the model of process classification allows us to better understand the activities of a business entity and to identify the basic value chain and the main categories of business processes, both support and management ones. Initially it also helps us classify processes and align responsibilities in the current organizational structure of an enterprise.

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References

Afuah, A., & Tucci, C.L. (2003). *Biznes Internetowy – Strategie i Modele*. Kraków: Oficyna Ekonomiczna.

Fielt, E. (2013). Conceptualising business models: Definitions, frameworks and classifications. *Journal of Business Models*, *1*(1), 85-105.

Harmon, P. (2007). *Business Process Change. A Guide for Business Managers and BPM and Six Sigma Professionals*. Burlington: Morgan Kaufman Publishers.

Jeston, J., & Nelis, J. (2008). *Business Process Management: Practical Guidelines to Successful Implementations*. Oxford: Elsevier.

Magretta, J. (2002). Why business models matter?. *Harvard Business Review*, *80*(5), 86–92.

Magretta, J. (2003). *What Management Is: How It Works and Why It's Everyone's Business*. London: Profile Books Ltd.

Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers* (1st edition). Hoboken, NJ: John Wiley and Sons.

Osterwalder, A., Pigneur, Y., & Tucci, C. L. (2005). Clarifying business models: Origins, present, and future of the concept. *Communications of AIS*, *16*(1).
Thompson, A.A., & Strickland, A.J. (2003). *Strategic Management: Concepts and Cases.* Boston: McGraw-Hill/Irwin.
Wagter, R., van den Berg, M., Luijpers, J., & van Steenbergen, M. (2002). *DYA: Dynamic Enterprise Architecture: How to Make it Work*. Sogeti Nederland.

Internet sources

Principles of corporate architecture. Version: 1.0 17.06.2015 r.
Ministry of Administration and Digitization. Retrieved from https://mc.gov.pl/files/pryncypia_pryncypia_architektury_korporacyjnej_podmiotow_publicznych_w._1.0.pdf
Sądeckie Wodociągi Spółka z o.o. Retrieved from http://www.swns.pl/8,Struktura_organizacyjna_i_struktura_wlasnosci.htm
International Accounting Standards (IAS). Retrieved from http://www.mf.gov.pl/ministerstwo-finansow/dzialalnosc/rachunkowosc/miedzynarodowe-standardy-rachunkowosci/-/asset_publisher/ho6Q/content/rozporzadzenia-komisji-europejskiej-przyjmujace-okreslone-miedzynarodowe-standardy-rachunkowosci?redirect=http%3A%2F%2Fwww.mf.gov.pl%2Fministerstwo-finansow%2Fdzialalnosc%2Frachunkowosc%2Fmiedzynarodowe-standardy-rachunkowosci%3Fp_p_id%3D101_INSTANCE_ho6Q%26p_p_lifecycle%3D0%26p_p_state%3Dnormal%26p_p_mode%3Dview%26p_p_col_id%3Dcolumn-2%26p_p_col_count%3D1#p_p_id_101_INSTANCE_ho6Q_

Legal acts

The Act of 08th March on municipal self-government. Journal of Laws 1990, No. 16, item 95.
The Act of 20th December 1996 on utilities management. Journal of Laws 1997, No. 9, item 43.
The Act of 05th June 1998 on district self-government. Journal of Laws 1998, No. 91, item 578.
The Act of 18th July 2001 Water Management Law, Journal of Laws 2001, No. 115, item 1229.
The Act of 19th December 2008 on public-private partnership. Journal of Laws 2009, No. 19, item 100.
The Act of 17th February 2005 on digitization of activities of entities performing public tasks. Journal of Laws 2005, No. 64, item 565.
The Act of 27th August 2009 on public finance. Journal of Laws 2009 No. 157, item 1240.

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NEW APPROACH TO BUSINESS PROCESS MANAGEMENT IN CONSTRUCTION COMPANIES

***Marek Szelągowski*[1]**

Abstract

The challenge that construction companies are faced with at present is the unique character of each executed investment. Each subsequent project is different. The projects differ in terms of the constructed objects, their architecture and functions, client needs, the standard of internal finishes, and rules of cooperation with the investor. Even if the constructed object is following the same blueprint, it is nonetheless different in terms of its immediate surroundings, its neighboring infrastructure, access to the construction site, its organization, and the requirements of the investor or local authorities. On the example of leading Polish construction companies (belonging, in fact, to leading European companies), the article points to the challenges associated with implementing process management in construction companies. The unique character of each investment, their ever-changing conditions, and the concurrent complexity of the executed business processes require the companies to search for new methods of modeling and implementing process management. This requires an approach to process modeling, in which the fundamental goal is no longer the search for or the implementation of a single "ideal process." The aim of the research was to find principles of practical process design; ones which would enable the adaptation of processes to the requirements of specific contracts in a transparent and workable manner. The article will showcase different attempts at overcoming these challenges, as well as point to the similarities between the prepared solutions, which account for the use of process management in accordance with the concept of dynamic BPM and alongside knowledge management from the onset of the modeling phase. The proposed solution uses the most popular BPMN 2.0 notation standard to model processes, which means that it can be used in standard implementations of process management.

Keywords: *business process management (BPM), unstructured processes, dynamic BPM (dBPM), process mining, communities of practice (CoP), business process management system (BPMS), knowledge management (KM), knowledge acquisition, active knowledge modeling (AKM), process-oriented knowledge management (pKM).*

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1. Introduction

Clients seek individualized products and services which are customized in terms of features, tailored to their individual preferences and habits, with instant on-demand shipping, an attractive price, and excellent quality. The expectations above force companies to change their management from market-oriented, and thus intended for the statistical, common-denominator client, in favor of management oriented on the individual client instead. This pertains to the construction sector in particular. A great challenge that construction companies are faced with is the unique character of each executed investment. Each subsequent project is different. The projects differ regarding the constructed objects, their architecture and functions, client needs, the standard of internal finishes, rules of cooperation with the investor, etc. Even if the constructed object is following the same blueprint, it is nonetheless different concerning its immediate surroundings, its neighboring infrastructure, access to the construction site, its organization, and the requirements of the investor or local authorities. In other words, no two construction projects are alike. The unique character of each investment, their ever-changing conditions, and the concurrent complexity of the executed business processes require the companies to search for new methods of modeling and implementing process management. Traditional, static process modeling, which concentrates on detailed descriptions of the logic behind executing a given process, leads to the creation of diagrams, in which "everything is connected to everything else". In practice, it is indeed the case that a large number of process tasks must be followed up with the option of holding consultations or negotiations, restarting the execution, or delegating the decision to the supervisors., When we also consider the fact that the traditional approach to quality management and process management process performers must strictly execute processes designed by their supervisors, modeling becomes the proverbial mission impossible. How is it possible to combine a single process enforced throughout the organization with the full individualization of investor requirements? This requires an approach to process modeling, in which the fundamental goal is no longer the search for or the implementation of a single "ideal process".

From the perspective of the organizations taking part in the project the aim of the research was to find principles of practical process design; ones which would enable the adaptation of processes to the requirements of specific contracts in a transparent manner transparent to the process performers, and one which enables the management of the investment execution. At the same time, the principles of describing and executing processes which were formulated in the course of the research had to enable the analysis of ongoing or finished processes. Finding the answer to this

fundamental question depends on answering several other, seemingly basic questions: When should organizations implement dynamic business process management? What risks are involved with the traditional, static management of processes which are dynamic in nature? What are the benefits of dynamic business process management to organizations? What is the role of hidden knowledge in dynamic business process management? Such questions are crucial in overcoming the limitations to implementing process management in organizations that are covered in the article, such as e.g. problems in communicating process maps and models due to their increasing complexity; traditional implementations of process management strengthening a culture of no responsibility; the loss of uncovered hidden knowledge due to the failure to integrate process management with knowledge management.

2. The process map

The article presents the results of research on the approach to business process modeling in three leading Polish construction companies: Budimex, Eiffage Polska Budownictwo, and Strabag. The research showcased herein was inspired by specific management activities undertaken almost contemporaneously in all three companies with the aim of making ground for the implementation of a workflow system (Budimex), preparing for the overhaul or improvement of an ERP system (Eiffage Polska Budownictwo), and implementing lean management (Strabag). The article was prepared on the basis of a series of interviews and workshops with the managers and employees of departments performing implementation activities, as well as by their analytical and implementation documentation.

2.1 The process map of a construction company

In accordance with the methodology of Business Process Redesign (BPR), process analysis in each of the companies began with the identification and creation of a process map aligned with the strategic direction of each company (Davenport & Short, 1990). During this stage of research, all of the expectations above responded to the following three questions:

1) Which processes comprise the main process?
2) What are the main support processes?
3) Who is responsible for the support processes within the organization?

Despite differences in nomenclature in regard to specific processes, the process maps of all of the companies were almost identical and were on the "n" level in accordance with the APQC model (APQC, 2015). The process map is presented in Figure 1.

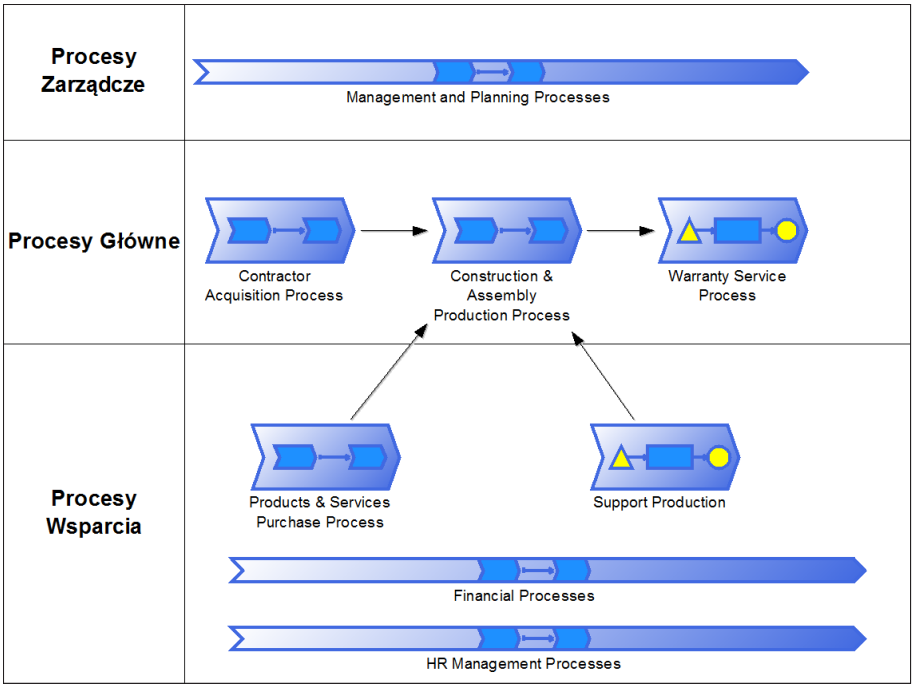

Figure 1. The standard process map for construction companies

Differences pertained to the detailed description of support processes (e.g. in Strabag "Infrastructure & Resource Management" was singled out as a specific support process). Alternatively, the handling of fundamental document groups or data on the level of the process map itself (e.g. in Eiffage Polska Budownictwo the process map included a schedule database, while in Strabag the onset of the Construction Process includes the preparation of a purchase schedule in cooperation with central purchases).

In all of companies above, the process of "Subcontractor Selection" figured as a fundamental element of the "Construction & Assembly Production" process, alongside the "Contractor Acquisition" process and the "Products & Services Purchase" process. For construction or development companies, this process functions as one of the most essential processes, one which often has a decisive role in whether a given project is profitable (or not) and whether the project is performed on time and its results are of appropriate quality. A wrong choice in selecting subcontractors could result in adverse economic conditions (adverse prices, payment terms), performance conditions (issues with schedules and quality), or organizational conditions (e.g. the loss of a subcontractor mid-project). At the same time, the "Subcontractor Selection" process is the process in which companies verify their knowledge

on the subcontractor and building materials market in the most direct manner available. For those reasons, this process has been selected for the subsequent, detailed stage of this research.

2.2 The "Selection of the Subcontractor of the site" Process Model (traditional)

The "Subcontractor Selection" process under evaluation comprises part of the main "Construction & Assembly Production" process. In some of the companies that took part in the research, parts of this process are also used in the "Contractor Acquisition" and "Products & Services Purchase" processes in order to perform a preliminary selection of subcontractors during the construction investment quotation stage.

During this stage of research, all of the companies responded to the following three questions:

- Is there a separate "Subcontractor Selection" process within the organization?
- What are the differences between the static "Subcontractor Selection" process presented in the diagram in Figure 2 & 3 and the process performed (in force) in the organization?
- Is the organization capable of accepting the dynamic model presented on Figure 4?

All of the companies that participated in the research confirmed that their "Subcontractor Selection" process is almost identical to one presented in the diagram from Figure 2 and 3. The main differences pertained to the level of depth (the number of steps), and the number of designed feedback loops crucial for the operations to be in concert with the interests of the organization.

One of the problems which all companies faced was the complex nature of the "Subcontractor Selection" process and the resulting problems with the supervision of its execution, as well as its computerization. In Budimex, the process was the simplest and comprised of a mere 13 steps and several feedback loops. In all of the companies, repeated attempts at its simplification resulted in the heated protests of individuals responsible for construction projects, who did not consent to be forced to operate within a workflow out of par with the conditions of the projects and market practices. Furthermore, these individuals contributed multiple thoughts and ideas pertaining to good practices, which should be included in the process itself, as well as in the ICT tools supporting its performance. In most cases, proposals for expanding the "Subcontractor Selection" process were formulated in a conditional manner: "according to circumstance...", "sometimes I'd like to...", "it would be good if...", "sometimes I check whether...". Another category were wishes regarding

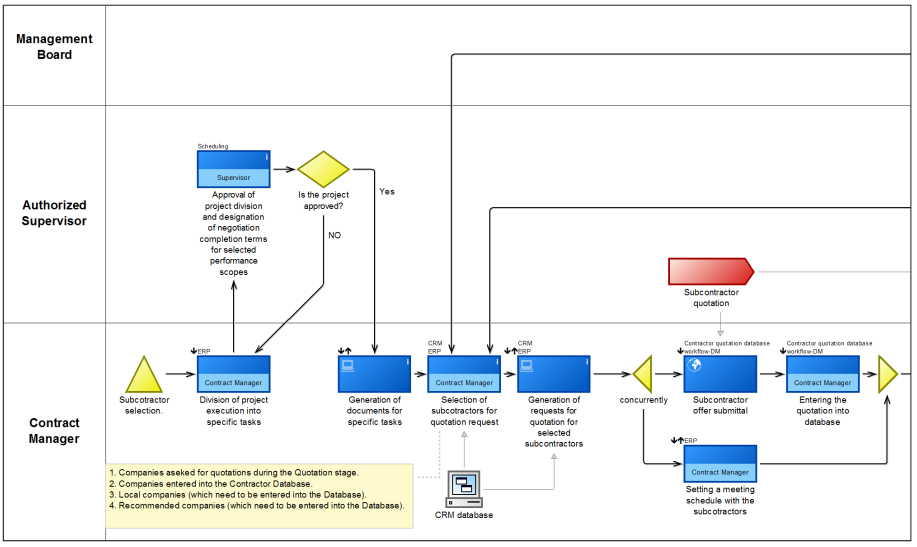

Figure 2. Diagram of the "Subcontractor Selection" static process (part 1)

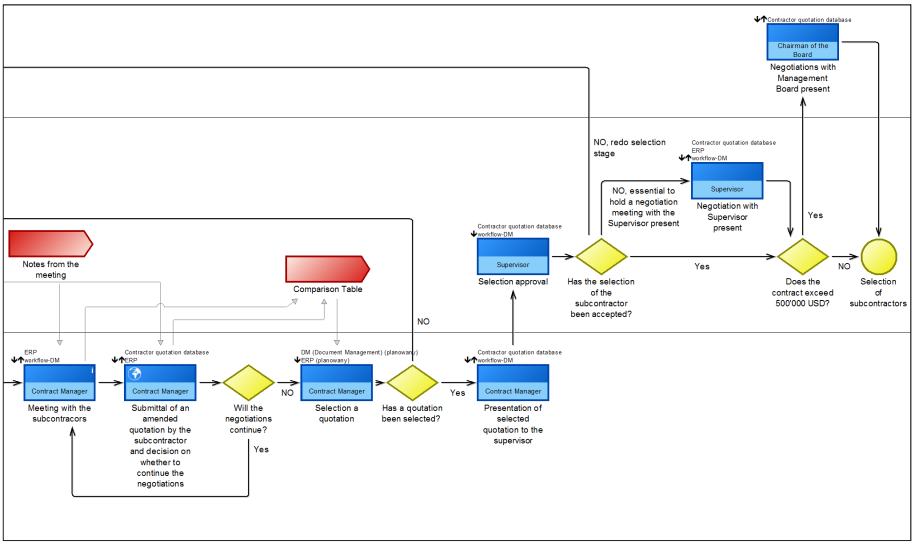

Figure 3. Diagram of the "Subcontractor Selection" static process (part 2)

data and information provided by the process. All research participants provided suggestions regarding the expansion of the scope of possible process evaluations. The individuals making the suggestions even accepted the ensuing larger time load associated with such an expansion. In all cases, the expectations were the result of specific situations stemming from the ongoing performance of contracts. For example, it was postulated that it should be possible to run a full comparative analysis of the "Subcontractor Selection" process for two subcontractors, should their respective quotations differ less than 1% in value, particularly when the cheaper subcontractor started world before the selection has been approved by the supervisors.

All research participants agreed that the further complication of the process in its current variation would make its computerization and management even harder. On the other hand, not introducing the postulated changes to the standard process model within the organization means that practical process performance deviates from the process model itself. Regrettably, knowledge on such operational deviations falls completely outside the reach of the company's management. Hence it is not assessed nor accumulated with the aim of its further implementation within the organization. Because the further complication of the process model is unwanted, in the research it was suggested instead to change the aims, as well as the methods of its modeling. Because of the risks mentioned above involved with the static modeling of processes which are dynamic in nature, this suggestion has been accepted by all of the organizations taking part in the project. Dynamic process management becomes the standard which replaces BPM. Organizations should perhaps decide on a partial implementation of dynamic process management in those instances where the beneficiaries of the process expect or the competition forces the complete customization of the process to the conditions of a specific implementation, or even its individualization?

2.3 The "Subcontractor Selection" Process model (dynamic)

On the basis of the research, a "Subcontractor Selection" process model has been prepared with the use of dynamic elements compliant with the BPMN 2.0. notation standard. The "Subcontractor Selection" process has been modeled on the highest level of the process. The entire process (construction project, developer project) was divided into technologically unified (sector-specific) tasks. The subsequent selection of a subcontractor for each of those tasks is achieved within the "Subcontractor Selection" sub-process. It is initiated independently for each task. In Strabag, in the course of an analogous process, the division into scopes is already performed during the investment calculation stage (the "Contract Procurement" process), and later in the course

of the "Investment Performance" process the division into scopes is reassessed and verified on the basis of experience and the offers at hand.

The "Subcontractor Selection" process offers the contract manager the option of performing the following 4 actions:

- Subcontractor quotation management,
- Comparison table analysis and post-meeting notes analysis,
- Consultations within the organization,
- Selecting the subcontractor(s) for a given task.

The aforementioned actions can be performed multiple times and repeated in a sequence resulting from the current state of construction, the actions of the designer, the investor, the subcontractors, the public administration bodies, as well as the type of construction, the technology (included in the project or substitute), the completion schedule, and other unforeseeable factors.

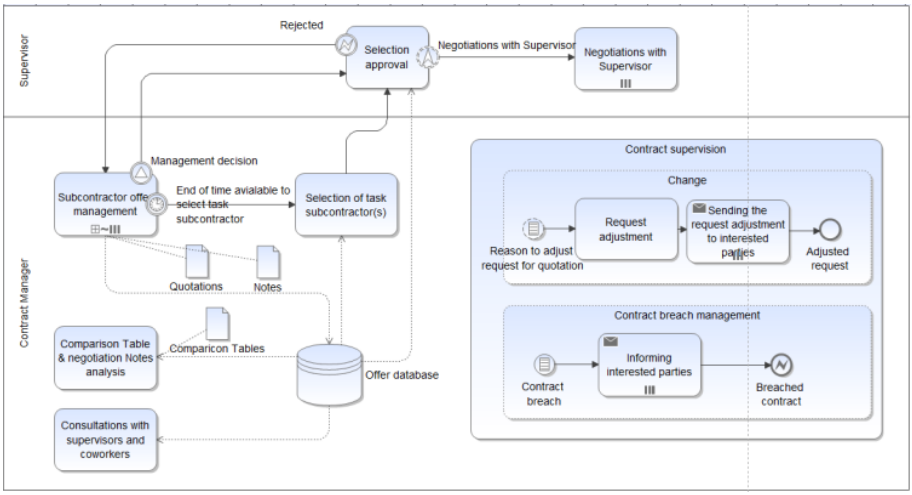

Figure 4. Diagram of the "Subcontractor selection" process in the dynamic variant

At the express request of the practitioners, the process has been supplemented with two tasks resulting from events independent from the decisions of the contract manager:

- Management of adjustments to the requests for quotation (e.g. due to discovered discrepancies in the documentation, shifting schedules, investor decisions.)
- Management of a breached contract (e.g. due to not receiving an advance payment on time, the contract being canceled by the ordering party).

The modeled process is performed on the basis of standard documents and a quotation database included in the diagram. In the case of the companies included in the research, the documents had different graphical templates and required different software, but their functions were nonetheless identical.

In the proposed process model, the process performer is given the full freedom to make decisions pertaining to his or her work. The process performer he or herself will decide on the sequence and the eventual need to repeat specific tasks, as well as the specific moment of selecting a subcontractor and submitting the decision for approval to authorized individuals (e.g. the supervisor and/or responsible individuals in central purchases). In effect, the proposed process model has multiple qualities, which thus far were regarded as belonging to the domain of Case Management (Belaychuk, 2011). Knowledge of the full context of the performed process is available to be assessed during and after the process performance itself. This has been achieved without burdening the process with additional decisions or feedback loops.

2.4 The "Subcontractor Quotation Management" Process model

The "Subcontractor Quotation Management" process is a fundamental sub-process of the "Subcontractor Selection" process. All companies participating in this stage of research were tasked with supplementing their process workflows with their used documents and fundamental data.

Within the standard model prepared in the course of research and depicted in Figure 5, the process is comprised of 5 tasks. In the case of Strabag, however, the process was divided into not 5, but a total of 8 tasks. In comparison with the process selected as the standard model (Figure 6), the Strabag process also accounted for:

1) Receiving preliminary quotations (quotations, e-mails).
2) Technical and business meetings, procurement of binding quotations (quotations and protocols).
3) Selection of finalists.
4) Business negotiations.

As in the previous process, tasks are performed according to the decisions of the process performer. He or she decides on the number of times subcontractor candidates will be selected, the number of adjustments to requests for quotations, as well as the number of meetings required to select a subcontractor for a specific task. When we label the subsequent tasks of this process as:

A – Selection of subcontractors,
B – Submission of a request for quotation to a selected subcontractor,
C – Submitting the quotation,

D – Meeting with the subcontractor,
E – Assessment of the quotation,
and the passage from one task to another with "→", we can present the basic performance of the process as:
A → B → C → D → E

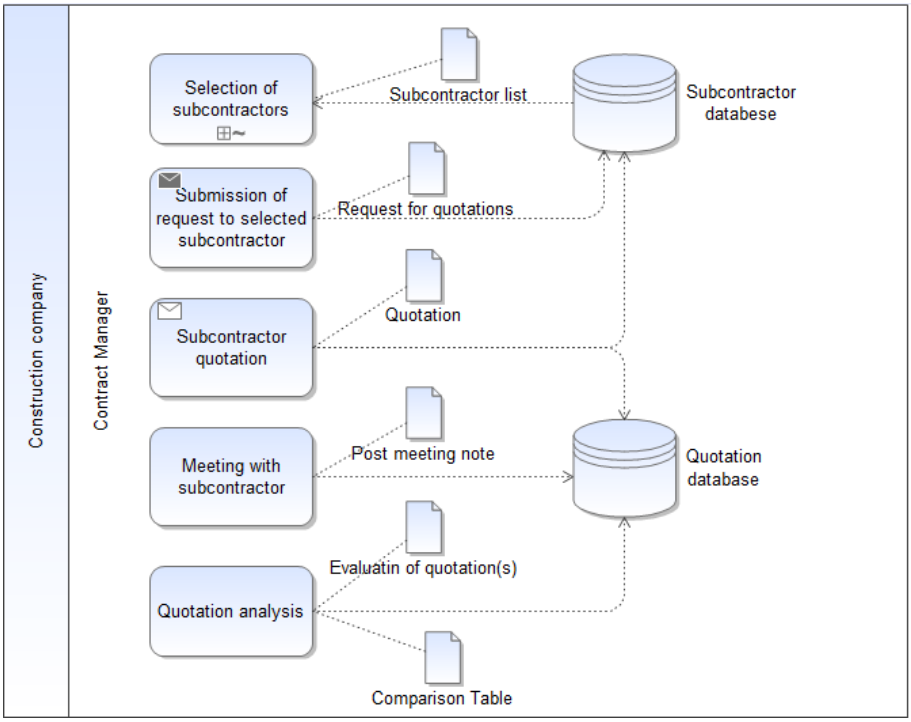

Figure 5. The "Subcontractor Quotation Management" process

The model presented in this article fulfills the requirements set by Strabag by imposing the requirement of repeating the „Subcontractor quotation" and „Meeting with subcontractor" tasks twice for all selected subcontractors and participants of the final proceedings. In such a case, we can present the process as:

A → B → C → D → C → D → E

Of course, performances of the process are possible in which account for multiple negotiations with the subcontractors and e.g. allow for changes to requests for quotations, as well as submitting quotations a multiple number of times within a single process. In such a case, the process within the BPMS system looks as follows:

A → B → C → D → D → B → C → D → E → B → C → D → D → E

Of course, each task is accompanied with data on its duration, as well as data on the submitted quotations or negotiated terms and conditions of implementation.

The description of an ongoing (or completed) process will complicate further if we take into account the subsequent management of quotations from multiple subcontractors. Nevertheless, the simplicity and the flexibility of the description, as well as the transparency with which one can analyze the work of contract managers or teams leading sales negotiations resulted in the delight of both process performers and their supervisors.

The sole limitation imposed by the methodology of dynamic BPM on the contract manager is the requirement of documenting the performed tasks on an ongoing basis by preparing requests for quotations in the system, entering quotations and post-meeting notes into databases (Szelągowski, 2014). The role of the IT system is the presentation of data entered into the system and their comparative analysis via e.g. the creation of comparison tables and making data available to other authorized employees within the organization. It is also possible to define rules according to which the system will automatically direct the attention of its users to specific data configurations, such as an exceptionally low price (e.g. at least 30% lower than the competition), a quotation submitted by a subcontractor with a negative qualification, or exceeding the time of subcontractor selection by more than 5 days.

2.5 The "Selection of Subcontractor Candidates" Process model

In all of the companies which participated in the research the "Selection of subcontractor candidates" process is performed in cooperation with the central unit responsible for sales. A list of potential subcontractors is determined – preliminary during the quotation stage and final during the execution stage. In the case of especially large and fundamental scopes of deliveries and performed works (e.g. deliveries of concrete, bitumen, or steel), the process is handled not by construction, but by central purchases, usually on the basis of long-term framework contracts.

Its aim is the selection of candidates for subcontractors among companies with prior work experience (qualified) and the ongoing search for new subcontractors among companies recommended by the Investor, subcontractors operating on the local market (small and medium-sized enterprises in particular), large global companies entering a given market. When labeling as before the subsequent tasks of this process as follows:

A – Analysis of ordering party requirements,

B – Analysis of the subcontractor database,

C – Search for new subcontractors,

D – Consultations with supervisors and coworkers,
E – Creation .update of list of subcontractors asked for quotations,

we can describe the common "authoritary" variant of the process as D → E

The standard variant in the companies which participated in the research looked as follows:

A → B → C → D → E or A → B → C → D → C → D → E or …….

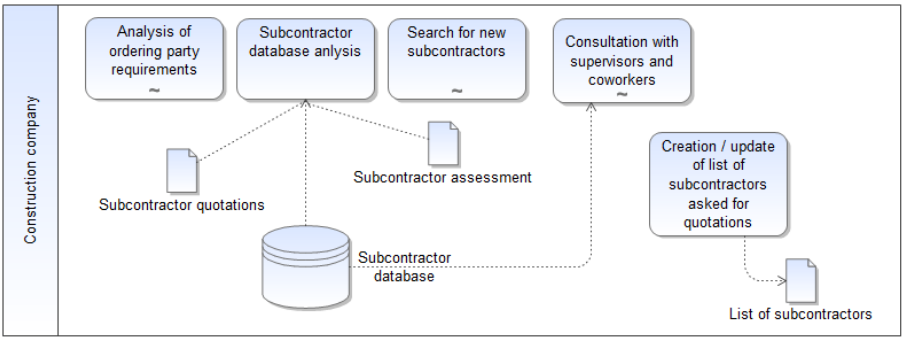

Figure 6. The "Selection of subcontractor candidates" process

3. Conclusions and future works

Process identification projects are currently underway in all of the organizations in question. The two main goals of implementation are:

1) Raising the effectiveness of business process performance.
2) Allowing for the collection and management of knowledge on the business processes performed within the organization.

The first goal of implementation is self-explanatory. The possibility of achieving the second goal is the indirect result of a change in approach to process modeling, which was formulated in the course of this research project. Its main goal is no longer the detailed (as exact as possible) reflection of the actual process performance (control flow). It is no longer required for the modeled process to prohibit actions which deviate from the „ideal" standard process. In the construction sector, where each investment is unique, there is no place for a single „ideal" process map. Hence the modeled standard process is meant to support its performers, providing them with the option of dynamically shaping their work according to well-proven best practices resulting from specific case studies. The proposed solution fulfills the requirements above by making available, within a business process modeled in accordance with BPMN, functionality which was thus far associated with

Case Management systems. Further works on the subject should determine whether this approach offers the practical combination of both concepts and their tools. (Knudson, 2014; Silver, 2014; Knudson, 2015; Palmer & Sanchez, 2015).

At the same time, it is essential to consider as one of the main goals of process modeling the collection, verification, and rapid dissemination within the organization. In addition, the knowledge on particular subcontractors and their quotations, the subsequent work on ongoing or completed projects, as well as well-coordinated knowledge on available materials and solutions., their prices, availability, failure rates in the warranty period (Venkateswaran & Aundhe, 2013).

As demonstrated in the article, the implementation of a BPMS system A.D. 2015 can enable the day-to-day collection and use of knowledge on process performances and their results. In such analyses, there is no need to use specialized software from the field of process discovery. By implementing BPMS (of course without forgetting about its integration with the existing ERP system) and having access to full data on the context of a given process performance in the event logs, we can replay, analyze, and compare the actual performance of a dynamically-modeled process with a standard process "as of today" (Process Mining Manifesto, 2012). It will suffice if BPMS analyses offer the possibility of:

- assessing of completed (ex-post) and ongoing (on line) single processes or performing comparative analysis on groups of processes,
- assessing changes (of values, and trends) to fundamental codified knowledge elements in relation to performed processes.

For all intents and purposes, this means that for construction companies, process mining is no longer a „novelty" from literature. Nor is it a methodology or technology which would require additional decisions and additional implementation. Process mining is a natural, expected element of business process management in accordance with the concept of dynamic BPM. Questions which will need to be answered in the further course of research are: How to effectively make use of exploration process techniques (process mining) to obtain and analyze practical knowledge? How to verify such uncovered hidden knowledge on a daily basis? And how to use such knowledge to gain a competitive advantage?

For the time being, none of the companies which took part in the research had formalized knowledge management processes. For example, in Strabag a formal exchange of information between construction projects takes place only via workshops based on case studies organized by the central departments of the organization. Of course, in all of the companies, there are informal processes of knowledge sharing at hand, which are based

on informal communities of practices. However, in order to accelerate knowledge management processes and achieve full efficiency, it is crucial to establish a strong connection between the performed processes and knowledge management processes within the organization. This requires further changes in the approach to process modeling in the near future. It is crucial to combine within one model elements of process description (BPM, or rather – dynamic BPM) and knowledge management (KM), as well as to integrate operational processes and their resulting knowledge management processes within the general process model of the organization (Remus & Schub, 2003). From this perspective, future articles should touch upon the subject of using process mining as a natural connective point between the methodologies of BPM (rather dynamic BPM) and Knowledge Management.

References

American Productivity and Quality Center (APQC). (2015). Process Classification Framework version 6.1.1-en-XI. Retrieved from http://www.apqc.org/

Belaychuk, A. (2011). ACM: Paradigm Or Feature? Retrieved from http://mainthing.ru/item/401/

Davenport, T., & Short, J. (1990). The new industrial engineering: Information Technology and business process redesign. *Sloan Management Review, 31*(4), 11-27.

Knudson, G. (2014). Approaching BPM vs Case Management. Retrieved from https://www.linkedin.com/pulse/20141002151632-5916120-approaching-bpm-vs-case-management

Knudson, G. (2015). BPM vs Case Management. Retrieved from http://www.bpmleader.com/2015/06/09/bpm-vs-case-management/

Process Mining Manifesto. (2012). Retrieved from http://www.win.tue.nl/ieeetfpm/doku.php?id=shared:process_mining_manifesto

Palmer, N., & Sanchez, J. (2015). *The Evolution of Case Management and BPM*. webinar 2015-07-30

Remus, U., & Schub, S. (2003). A blueprint for the implementation of process-oriented knowledge management. *Knowledge and Process Management, 10*(4), 237–253.

Silver, B. (2014). Sudden Impact: IBM Merges Case into BPM (but forgets to announce it). Retrieved from http://brsilver.com/sudden-impact-ibm-merges-case-bpm-forgets-announce/

Szelągowski, M. (2014). Becoming a Learning Organization through dynamic BPM. *Journal of Entrepreneurship, Management and Innovation, 10*(1), 147-166.

Venkateswaran, V., & Aundhe, S. (2013). Managing knowledge in a construction company—A Process Model. *Knowledge and Process Management, 20*(2), 59-70.

Biographical note

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THE USE OF A BUSINESS MODEL IN DESIGNING AND OPERATIONALIZING PROCESSES

Anna Ujwary-Gil[1] and Natalia Potoczek[2]

Abstract

The operationalization of a business model in particular areas requires the application of appropriate management concepts and methods. One of such concepts is Business Process Management (BPM), founded on an assumption of complex management of an organization aimed at providing value to customers. Simultaneously, designing a process-based organization calls for a proper understanding of the business model of an organization, its key elements and mutual relations appearing in the model. This paper demonstrates the relationships between a business model and process management, as well as the usefulness of the BPM concept in developing a business model.

Keywords: *business model, business process management, BPM, value, customers, research, operationalization.*

1. Introduction

Analyzing the growing interest in business models, we should notice that it has been accelerating at an unprecedented speed since the mid-1990s. If we compare this growth with the increasing interest in business models, commonly recognized as one of the key aspects of the operations of an organization (Figure 1)[3], we will undoubtedly see that it is an intriguing result.

The "y" axis of the presented graph determines the percentage share of the key words: business model and business process in the total number of words in books published from 1950 to 2008.

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3 We used Google Ngram Viewer, which, thanks to the analytical capabilities of the software, allows us to trace the appearance of particular words in Google-indexed books, containing approximately 450 million language units. The drawback of this software is its limited time range (at present we can trace trends up to 2008) and the search limited only to books, excluding scientific journals and magazines.

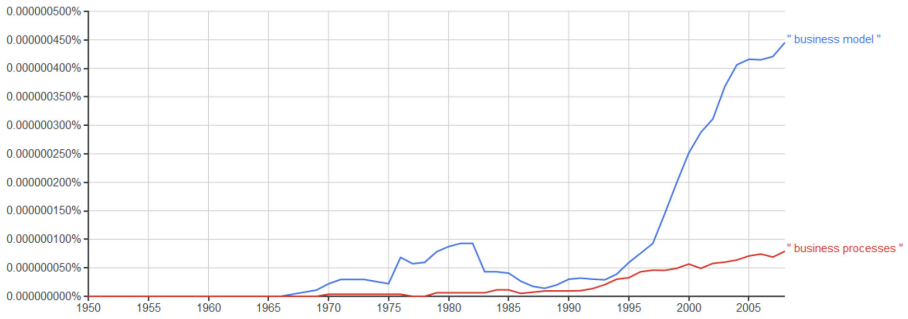

Figure 1. Business model and business processes trends

Source: Based on Google Ngram Viewer.

We may risk putting forward a thesis that business models fill a methodological gap in designing organizations and they might push the strategy to the operational level. In the classical presentation, the starting point in designing processes was the strategy of an organization, whose role in management has long come in for a lot of criticism. It should be noticed that in the perspective of the shortening production cycles in the economy, the strategy of an organization provides answers to the following questions: how to implement processes and what level of revenues and costs will allow us to accomplish our goals? These activities are performed on the degree of business analyses focusing mostly on process efficiencies, thus on the effectivness of the operational activity of an enterprise.

However, in order to indicate which processes should be implemented in the long or short run, we need to take a broader look, bearing in mind the current dynamics of changes in the environment and customers' expectations. It is possible that business modeling is a more useful tool in developing innovativeness in an organization. The full understanding of the business model by employees facilitates the search for innovative solutions in providing customers with desired values through the implemented processes. These two concepts are interrelated, especially when we consider value generation, which plays a vital role in business models, designing and improving processes in an organization.

The article is divided into four sections. Apart from the introduction, the article presents elementary definition issues, the main methodological assumptions of the article and the business model and business processes of an organization selected for analysis; that is Library X. The article ends with conclusions and indication of further directions for research.

The primary goal of the article is thus to indicate the common elements and dependencies between the business model and process management of a selected organization. Both business model and business processes should be created taking into account opportunities and threats posed by the external environment of the organization (Figure 2). It is worth noticing that the analysis of opportunities and threats is performed in order to evaluate the business model and then to create a strategy for the organization. First, an idea of a venture must originate, followed by the calculation of the conditions for implementation, not the other way round. That may explain why business models have more to do with visionary work that a business strategy based on economic calculation. In search of innovations, business models generate by far better opportunities, since fewer barriers emerge when they are created (see e.g. Balboni & Bortoluzzi, 2015; Freiling, 2015; Günzel-Jensen & Holm, 2015; Harima & Vemuri, 2015; Jokela & Elo, 2015; Müller & Vorbach, 2015; Straker & Wrigley, 2015; Torkkeli, Salojärvi, Sainio & Saarenketo, 2015).

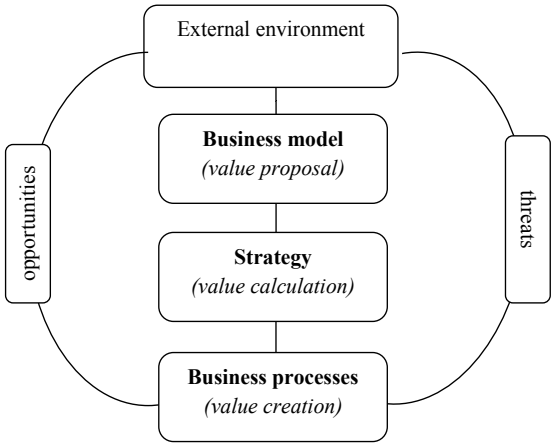

Figure 2. The diagram of the relations between the environment, the business model and the business processes

Business models cover the areas of analysis which should be conducted with reference to the organization's environment; that is opportunities and threats related to the value proposed to customers. However, for the needs of operationalizing the business model, it is necessary to develop or refer to methods which will allow us to relate to the relations between particular elements and consequences of revenues and costs.

2. Business model and business processes definitions

The business model is perceived through value creation for customers and in building a model directed at providing such value (Aspara, Lamberg, Laukia & Tikkanen, 2013; Chesbrough & Rosenbloom, 2002; Johnson,Christensen & Kagermann, 2008; Magretta, 2002; Morris, Schindehutte &Allen, 2005; Teece, 2010; Zott, Amit & Massa, 2011). It determines the details of a value proposal to stakeholders of an organization and the system of activities (processes) performed in order to create and deliver value to customers (Seddon, Lewis, Freeman & Shanks, 2004). Let us adopt, after Johnson (2008), that the business model is a value proposal for the customer, a profit formula, key resources and processes in the context of creating and delivering value to customers. On the other hand, we may assume after Zott and Amit (2010) that a business model is a new unit of analysis, a holistic perspective allowing us to determine how organizations conduct their activity, with emphasis placed on activities (processes) and value creation. The business model particularly stresses the measures of the value, its sources, value for a customer, value proposal and aspects related to the so-called network architecture (Kay, 1995) between an organization and external partners. The business model is also often defined in the context of conceptualizing ties between an organization and its stakeholders, especially customers (Baden-Fuller & Morgan, 2010) and concentrates on cooperation, partnership, joint creation of value, recognizing the interdependence of the performed activities as an essence of the business model (Zott & Amit, 2010).

Osterwalder and Pigneur (2010) propose the most complex business model canvas. They perceive the business model as an outline of the strategy which is to be implemented within the organization's framework, processes, and systems. The business model describes the premises behind the way in which an organization creates value, secures and draws profits from this created value (pp. 18-19). Among its nine key elements, the central position is occupied by the value proposal, which corresponds to the customers' needs, followed by:

- customer segments serviced by the organization,
- channels through which proposed values reach customers,
- relations which are shaped with particular segments of customers,
- revenue flows, which stem from the implementation of the value proposal,
- key resources, that is assets necessary to formulate and satisfy previous customers' needs,
- key activities are undertaken by the organization in order to create and deliver value to customers,
- key partners with whom the organization cooperates in order to gain value for customers,

- cost structure which indicates how particular elements in the Model generate costs.

Analyzing the activities undertaken by the organization to create and deliver value to customers we need to define the problem area of this element of the model. Actions are taken in a determined organizational configuration. For over two decades the process approach has dominated the economic ventures in the organization. The process approach to organizational management dates back to the concepts of a production system described by Taylor at the beginning of the 20th century (1911). Organizational processes gained popularity with the emphasis on quality and statistical methods in management and with the appearance of the TQM (Total Quality Management) concept. In the past decade, the development of integrated IT systems of management has led to the development of process management concepts. At the beginning of the 21st century, a holistic concept of Business Process Management (BPM) originated, reflecting previous approaches, such as Business Process Reengineering (BPR), Enterprise Application Integration (EAI), or Workflow Management (WFM). The holistic evolution of the process approach has been noticed by, inter alia, Smith and Fingar (2003, 2007). At present, BPM approach is used in a wide context and it refers to enterprise organization, process architecture, methods, techniques, and tools – mostly IT ones, used for mapping, automating and improving processes. BPM now constitutes a holistic concept of organizational management based on the assumption that processes are a key mechanism for delivering value to customers, as well as to owners and other stakeholders. The assumption concerning the delivery of value to customers through processes goes well with the business model concept proposed by Osterwalder and Pigneur (2010), for whom key activities are aimed at creating and delivering value to customers.

One of more popular models used in designing processes is the SIPOC model (Suppliers, Inputs, Process, Outputs, Customers) presented by Pande, Neuman and Cavanagh (2003). The model assumes that a process is designed by determining the recipient's requirements and expectations, which constitute input data and define the goal which we try to accomplish. The output data shows whether the assumed level of customer satisfaction has been achieved or not. The total client-orientation in the process approach means that in operationalizing the business model in key activities, we should use the BPM concept.

3. Research questions and methodology

The subject of the research is to identify the relations between the business model and process management, as well as the possibilities of using BPM

in operationalizing the model. The subject of the research is a university library which also provides its services outside the academic community. The choice of the library as an object of our research was intentional, related to the implementation of a research project (see footnote 1), which analyzes four case studies. One of them is the above-mentioned library.

First of all, the business model of the library was identified with the *business model canvas*, and then it was evaluated, taking into account the strengths and weaknesses of the library and the opportunities and threats provided by the environment. Then, on the basis of the identified principle activities and resources, a map of processes was developed, following the BPM approach, which differentiates core business processes and supplementary processes and their significance to the process management. It was demonstrated that process modeling is connected with creating value for customers, whereas the designed value chains aim at transforming resources in order to create and deliver value to customers.

BPM allows us to determine relations between processes and other process elements. To achieve this, we indicated the relations between processes, activities and resources. Tying these elements ensures better control of costs incurred in the implemented processes.

Bearing the above in mind, the following research problems were formulated:

1) What are the common elements and interdependencies between the business model and process management of the selected organization?
2) How does the use of the business model concept determine the operations of the organization?
3) How does the use of BPM support the operationalization of the business model?

The survey is based on the analysis of documents and questionnaires, which allowed us to interpret them and to come to certain conclusions.

4. Business model and business processes of the selected organization

External environment: opportunities and threats

Library X enjoys a good reputation in the community, associated with a high position of the University within which Library functions, not only in the national education and research market. There are a number of factors conducive to this, such as the growing importance of technical education observed in the past few years, the openness of University graduates as Library regular customers – they consolidate the trend of combining science and technology with an economy whose main resource is knowledge and its

use Moreover, efficient flow of information and access to the latest research results helps identify the gap in the commercialization of research results; finally promoting access to scientific research results in open access form. Also, the location of the Library is important – in the center of the country, favorable for all cooperation and being a leading unit providing high-quality services.

The position of the Library as a scientific and educational unit depends on the expenditure on its operations and development. Therefore, it is essential to obtain new library software of new generation – ALMA – and to gain and use the maximum amount of project means from Horizon 2020 program for investment and expanding the collection. The accomplishment of this goal is supported by the Act of 29th January 2004 – Public Procurement Law, which anew defines the university responsibility to purchase library materials following a simplified procedure which does not require that libraries should organize public tenders to buy the collection. Moreover, the Library as a didactic unit is exempted from paying VAT tax for equipping it with computer hardware and the latest software.

The Library's cooperation with international libraries offers a possibility of gaining knowledge on new trends, whereas its participation in the Europeana project gives it an opportunity to join the digital library of Europe. On the national level, cooperation with BIP MSW helps to share the collection; it is equally important to cooperate with faculty and institute libraries and to have stable relations with suppliers with barter exchange of benefits. The Library has benefited from numerous projects implemented within the Science Popularization Activities (SPA), aimed at improving the quality of services offered by the University Library and IT system, as well as better utilization of the collection.

The Library sees an opportunity for itself in transforming into a key scientific and research unit on the Master's degree level and in providing access to its resources from any place or computer. An important role is played by the regulators (for example Rector), who are open to initiatives and to the implementation of legal provisions while providing financial support. It is also considered whether services should be centralized as far as university administration is concerned, as it ensures efficient management.

There are also a lot of negative factors affecting the operations of the Library. They may be divided into macro and micro factors. On the macro level, these comprise the lack of firm policy of higher education sector development and the principles of financing it; legal regulations which deregulate the profession of a certified librarian and relatively low salaries in library professions; or the implementation of new regulations concerning Health and Safety. We should also mention the risk of concluding unfavorable

long-term contracts and high costs of purchasing the collections and the general equipment and exploitation. The biggest threats, however, are connected with financial risk, including: ceasing the financing of national licenses for access to basic scientific information sources; threatening financial liquidity and inability to meet obligations or changes to the system of financing the Library. On the micro level, apart from financial threats, there is a risk of possessing equipment and software that does meet the minimum technical requirements, the partitioning of the Library and its dispersion, decentralization of the library and IT system as well as internal conflicts among employees.

The business model

In order to identify the Library business model, we used the concept of Osterwalder and Pigneur (2010) and then we characterized nine elements included in w *business model canvas* (Table 1):

Table 1. The components of the Library business model

Business model components	Attributes
Value proposal	- quick access to the collection and new items in a given field; - number of collections adequate to orders; - place where collections are available (distance, free access to the premises); - access to electronic resources; - ease of finding collections - well-stored works (visible all over the world) - information services; - regular notification on the deadline for the borrowed book; - efficient and regular contact with the library using forms: Ask the Librarian, Propose for the Collection; - home page of the Library; - access to the reading room 71 hours per week; - ensuring a place for quiet individual and team work.
Customer segments	- scientists, lecturers; - students; - hobbyists; - children, youth, senior citizens.
Distribution channels	- website; - system of visual information; - 4 Binfo monitors; - leaflets; - electronic mail; - messages passed at the Senate and Faculty meetings; - free access (reading room).

Business model components	Attributes
Customer relations	- personal; - automated relations (ordering via library website) - access to electronic resources via HAN system; - digitized relations (remote access, contact).
Partners	- Faculties; - University libraries; - other external libraries; - suppliers of collections.
Key resources	- human resources: competencies in library science, sciences, information science, information and communication technologies, marketing, negotiations, pedagogy, multimedia presentations; - tangible resources: rooms with equipment allowing the library, reading room, storage area and archive work, educational classes, equipment in the computer lab, office equipment (computer hardware); - intangible resources: software, integrated IT system, Aleph, Oracle, Omega-Psir, Zotero, ProShow, DLibra, Program Han, Java, Moodle, ReWorks, SAP, USOS, ZSB.
Key activities	- core processes: identifying the needs of library customers, gathering, developing, record-keeping library resources, informing and educating customers, sharing library resources; - support processes: personnel processes, financial and accounting processes, IT processes – LAN administration, technical maintenance.
Revenue flows	- university subsidies, a didactic subsidy from which general university subsidy is singled out (part from statutory research); - subsidy from Ministry of Science and Higher Education; SPA - income from providing services; - special fees for returning books past the deadline.
Cost structure	- salaries; - purchasing collections; - material and energy consumption; - depreciation; - internal services (costs of use, purchases from own publishing house).

Source: Based on Ujwary-Gil (2016, pp. 919-920).

These elements of the business model concern not only the most important resources and key activities in the value chain of the organization, but also value proposal, customer relations, distribution channels, customer segments, cost structure and revenue sources – which allows us to compare a given model with other models existing in the market, in spite of different configurations of their constituting components.

Business processes

Creating values proposed in the business model requires, among other things, appropriate designing, implementation, and realization of processes. Contemporary concepts of business process management significantly refer to the importance of the value provided for customers. Therefore the architecture of organizational processes is built on chains of value delivered to customers. The ultimate value is created during the appropriately configured processes and activities that are viable due to appropriate, skillfully provided tangible and intangible resources.

The question of how a particular value is to be created is a question about the core business processes of an organization and about support processes which help provide necessary resources and services. Business processes reflect a mutual influence of people, material resources, knowledge, and information (see Figure 3 and Table 2). They help us learn how value is created in an organization, especially as there are various stages in which a product or a service are created and delivered to a customer. The main value chain covers groups of processes where the effects achieved in some processes supply further processes so as to lead to the completion of resource transformation with the provision of values proposed in the business model (Table 1) to customers from particular segments. In each organization, the implementation of core business processes must be aided with support processes, which means that support processes also have their recipients – internal customers. Although the business model mostly covers external customers and activities aimed at creating and delivering values thanks to which revenue flows are generated, it must be remembered that the incurred costs must also take into account support processes and activities. In the bottom line, they will be essential for obtaining satisfactory levels of profits.

The above map (Figure 3) presents the main activities included in the business model divided into core and support processes. However, to identify the full scope of tasks performed in the Library, we would have to present the full hierarchy of process structure. Figure 3 presents the concept of a hierarchical presentation of the chain of values, processes, and sub-processes. Process identification is conducted on various levels, leading us to single tasks. Proper understanding and design of the processes allow us to increase our control over the organization of activities and incurred costs.

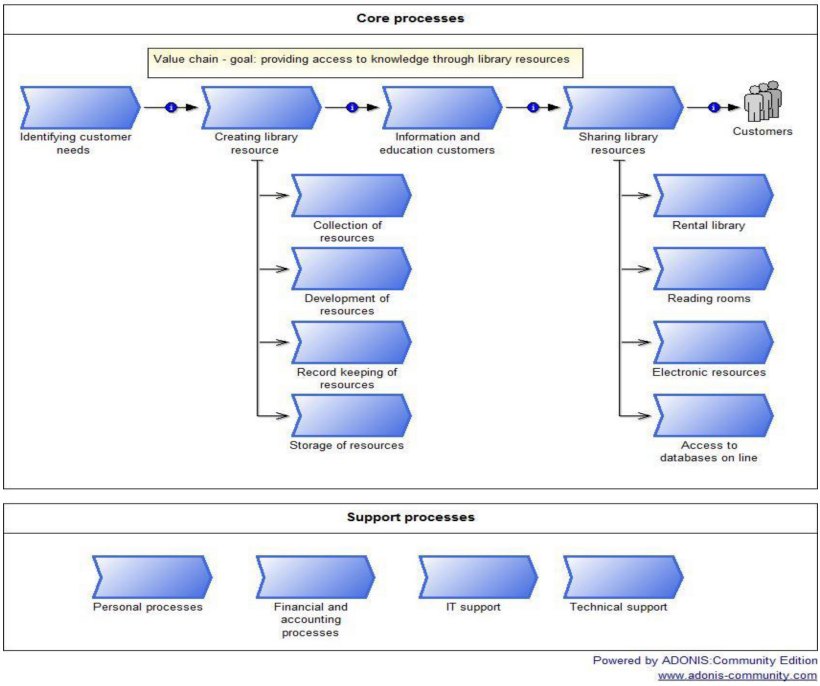

Figure 3. The map of Library processes

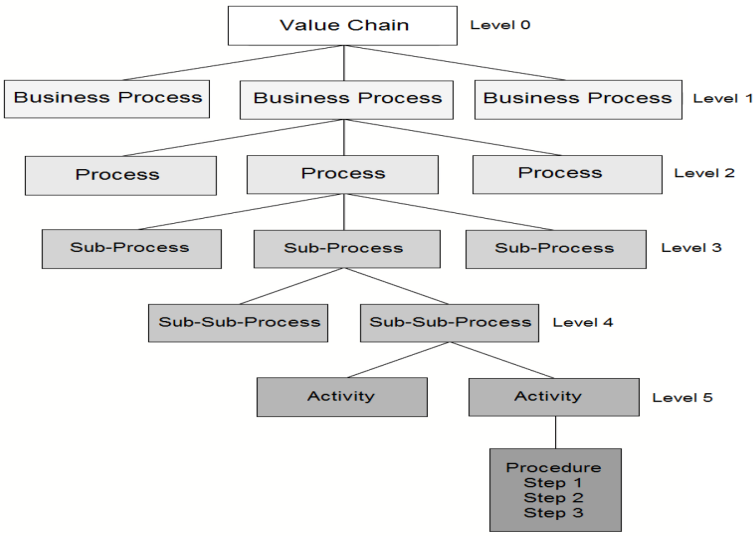

Figure 4. A hierarchical decomposition of a value chain

Source: Harmon (2007, p. 81) and Potoczek (2016, p. 119).

Table 2. Key activities of the Library included in the value chain

Value chain: ensuring access to knowledge through library resources			
Core processes	**Sub-processes/activities**	**Important human resources**	**Basic tangible and intangible resources**
1. Identifying the needs of library customers	Identifying the needs of particular segments.	Knowledge of education programs, KRK in sciences, library science, national and foreign publishing market.	Access to scientific bases, Pro Show, DLibra, Integrated Library System
2. Creating library resources	Gathering library resources. Developing resources. Record keeping of resources. Storing resources.	Knowledge of library science, information science, IT and marketing skills	Integrated IT System, Aleph, Oracle, financial means for purchasing collections, server, terminals, PCs, rooms and library equipment for office and didactic work.
3. Informing and educating customers	Creating the homepage. Creating a register of purchased items. Creating the visual information system. Developing promotional materials. Testing access and databases. Informing about collections. Providing answers to scientific research. Developing the education program in information education (KRK). Tailoring the program to the needs of University faculties. Trainings in methodology of research Trainings in e-learning.	Knowledge of Library science, Information science, Pedagogy, ability to service websites, ability to use graphic software, didactic skills, ability to prepare and deliver multimedia presentations.	Binfo, Aleph, Pro-Show, DLibra, Program Han, Java, Computer hardware, leaflets, information materials.
4. Providing access to library resources	Providing remote access to the electronic collections. Creating electronic versions of documents. Creating full-text bibliography. Creating board exhibitions.	Knowledge and skills of organizing work in the library. Ability to use computer techniques to service databases, library website, and to provide remote library services.	Library premises, electronic resources, access to scientific bases

The business model operationalization should entail relations between particular elements. Table 2 below presents important resources used at various stages of the value chain implementation. The use of the hierarchical decomposition of processes would allow us to determine precisely the resources necessary to accomplish particular processes, sub-processes, and final tasks.

Referring to the BPM concept for the purposes of business model implementation we gain the structured methodology of designing processes and managing them. Process management allows us to identify precisely the resources needed at all stages of process implementation and thus the costs incurred.

It is worth remembering that the management process should facilitate the organization of flexible response to changes in the environment. The relevant benchmark, in this case, is the dynamic model. An interesting example is the Szelągowski's concept (2014, pp. 151-152) for dynamic business process management (DBPM). The idea of DBPM is a practical solution for managing a learning organization. The concept is the basis for the implementation of process management according to three basic principles, which the author defines as:

- evolutionary changeability during the realization process,
- processes are considered completed only after having been documented,
- comprehensiveness and continuity. Because DBPM assumes variability, complexity and continuity of the process, the obvious consequence is permanent process improvement.

5. Conclusions

The application of the business model in identifying the activities of the library is a useful tool. It does not allow us to identify the value proposal and the segments of customers to whom the value is directed, but also the conditions in which the library functions, obtains revenues and incurs costs. The article in the business model operationalization indicates that it is necessary to use the concepts and methods of organizing business ventures which also rely heavily on strong customer orientation and consequently, on creating values recognized by customers. The literature studies, followed by the identification of the Library business model and the preliminary identification of business processes and grouping them helped us arrive at conclusions concerning the adequacy and usefulness of the BPM concept for the needs of business model operationalization. The BPM concept allows us to plan activities, coherent

with the model assumptions, which will help us to create and deliver values to particular segments of customers.

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References

Aspara, J., Lamberg, J.-A., Laukia, A., & Tikkanen, H. (2013). Corporate business model transformation and inter-organizational cognition: The case of Nokia. *Long Range Planning*, *46*(6), 459–474.

Baden-Fuller, C., & Morgan, M. S. (2010). Business models as models. *Long Range Planning*, *43*(2–3), 156–171.

Balboni, B., & Gortoluzzi, G. (2015). Business model adaptation and the success of new ventures. *Journal of Entrepreneurship, Management and Innovation*, *(11)*1, 119-140.

Burlton, R.T. (2001). *Business Process Management. Profiting from Process*. Indianapolis: SAMS.

Chesbrough, H., & Rosenbloom, R. S. (2002). The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change*, *11*(3), 529–555.

Freiling, J. (2015), Business model innovation – A concept between organizational renewal and industry transformation. *Journal of Entrepreneurship, Management and Innovation*, *(11)*1, 3-10.

Günzel-Jensen, F., & Holm, A. (2015). Freemium business models as the foundation for growing an e-business venture: A multiple case study of industry leaders. *Journal of Entrepreneurship, Management and Innovation*, *(11)*1, 77-102.

Harima, A., & Vemuri, S. (2015). Diaspora business model innovation. *Journal of Entrepreneurship, Management and Innovation*, *(11)*1, 29-51.

Harmon, P. (2007). *Business Process Change. A Guide for Business Managers and BPM and Six Sigma Professionals*. Burlington: Morgan Kaufman Publishers.

Johnson, M. W., Christensen, C. M., & Kagermann, H. (2008). Reinventing your business model. *Harvard Business Review*, *86*(12), 50-62.

Jokela, P., & Elo, M. (2015). Developing innovative business models in social ventures. *Journal of Entrepreneurship, Management and Innovation*, *(11)*1, 103-118.
Kay, J. (1995). *Why Firms Succeed*. New York: Oxford University Press.
Magretta, J. (2002). Why business models matter. *Harvard Business Review*, *80*(5), 86–92, 133.
Morris, M., Schindehutte, M., & Allen, J. (2005). The entrepreneur's business model: toward a unified perspective. *Journal of Business Research*, *58*(6), 726–735.
Müller, C., & Vorbach, S. (2015). Enabling business model change: Evidence from high technology firms. *Journal of Entrepreneurship, Management and Innovation*, *(11)*1, 53-76.
Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers* (1st edition). Hoboken, NJ: John Wiley and Sons.
Pande, P. S., Neuman, R. P., & Cavanagh, R. R. (2000). *The Six Sigma way: How GE, Motorola, and other top companies are honing their performance*. New York: McGraw-Hill.
Potoczek, N. (2016). *Zarządzanie Zasobami Ludzkimi W Organizacji Zorientowanej Procesowo*. Warszawa: Wydawnictwo Naukowe PWN.
Seddon, P. B., Lewis, G. P., Freeman, P., & Shanks, G. (2004). The case for viewing business models as abstractions of strategy. *The Communications of the Association for Information Systems*, *13*(1), 64.
Smith, H., & Fingar P. (2003, 2007). *Business Process Management. The Third Wave*. Meghan-Kiffer Press.
Straker, K., & Wrigley, C. (2015). The role of emotion in product, service and business model design. *Journal of Entrepreneurship, Management and Innovation*, *(11)*1, 11-28.
Szelągowski, M. (2014). Becoming a Learning Organization through dynamic BPM. *Journal of Entrepreneurship, Management and Innovation, 10*(1), 147-166.
Teece, D. J. (2010). Business models, business strategy and innovation. *Long Range Planning*, *43*(2–3), 172–194.
Torkkeli, L., Salojärvi, H., Sainio, L.M., & Saarenketo, S. (2015). Do all roads lead to Rome? The effect of the decision-making logic on business model change. *Journal of Entrepreneurship, Management and Innovation*, *(11)*3, 5-24.
Ujwary-Gil, A. (2016). The concept and stages of the audit of intangible resources: A network approach. In: S. Moffett and B. Galbraith (Eds.), Proceedings of The 17th European Conference on Knowledge Management (pp. 919-920). Belfast, UK.
Zott, C., & Amit, R. (2010). Business model design: An activity system perspective. *Long Range Planning*, *43*(2–3), 216–226.

Zott, C., Amit, R., & Massa, L. (2011). The business model: Recent developments and future research. *Journal of Management*, *37*(4), 1019–1042.

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SIGNALLING CHANGES IN THE BUSINESS ENVIRONMENT IN THE INFOLOGICAL PERSPECTIVE. THE SIGNIFICANCE OF THE „WEAK SIGNALS" CONCEPT

***Janusz Bąk*[1]**

Abstract
Information and decision-making processes implemented in organizations moderate relations between the organization and its environment. The organization has a possibility to anticipate the states of objects owing to the ability to receive signals and interpret them correctly. The subject of the paper is the problem of signaling changes in the business environment by (weak) signals, presented in the infological perspective which distinguishes the level of potential information attributed to an object, and active information attributed to the user. The aim of the paper is to show a problem which is cognitively interesting and still very poorly recognized empirically, namely the course and the conditionings of the effectiveness of the processes of perception and interpretation of (weak) signals about changes in the business environment.
Keywords: *signaling changes, weak signal, infological perspective, environmental analysis.*

1. Introduction

Information and decision-making processes implemented in organizations moderate relations between the organization and its environment. The effectiveness of these processes depends on the ability to identify undergoing changes already at their very early stage. Therefore, it is necessary to anticipate the trajectory of development on the basis of the identified events which can be linked to discontinuities following them. Objects[2] in the business environment generate various signals, but their use in the decision-making process is conditioned by their perception and interpretation. The organization has a possibility to anticipate the states of objects owing to the ability to

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2 Any material object, a process, an event (their attributes), an abstract notion, the property of another object, etc. (Stefanowicz, 2004, p.14).

receive signals and interpret them correctly. The adaptation and development of the organization is a consequence of the use of information in making sense of changes, generating new knowledge, organisational learning and taking decisions.

The subject of the paper is the problem of signaling changes in the business environment by (weak) signals, presented in the infological perspective which distinguishes the level of potential information attributed to an object, and active information attributed to the user. Such an approach seems adequate considering the fact that changes undergoing in the environment are signaled, but only few organizations recognize them properly and use them in decision-making processes.

The aim of the paper is to show a problem which is cognitively interesting and still very poorly recognized empirically, namely the course and the conditionings of the effectiveness of the processes of perception and interpretation of (weak) signals about changes in the business environment. In this context, the following research questions seem relevant: what should be the scope of the observation of the environment and what sources of potential information should be used in recognition of changes in the environment (discovering potential information?) how should the interpretation of (weak) signals in the organisation proceed so that they could be transformed into active information, adequate to make decision with regard to changes in the environment? What are the barriers to the effectiveness of these processes, conditioning the progression of the recognition of changes in the environment?

For the needs of the problem defined in this way, the conceptual and theoretical research methodology was primarily applied, and the paper is of theoretical character due to the lack of significant empirical research concerning the subject thus defined. Therefore, the author is fully aware of the limitations arising from that and the necessity to treat the article as a contribution to the empirical research and further theoretical explorations.

2. Signals in the infological perspective

Objects, making up the statics and dynamics of the business environment, are a source of various messages supplying decision-making processes which we can analyze on two levels: datalogical and infological. The first of them, the datalogical level, enables to analyze information as potential. This level is objective information, occurring regardless of the object observer. The datalogical level is information which is a relation defined on the elements of the message K, which is I(K). The message itself is defined as K:=p(O,A,t,v). The system of K thus defined is a predicate p describing object O, where A is an argument of the predicate specifying the aspect of the description, in

specific time t and in the conditions v (Stefanowicz, 2004, pp. 13-22). Every object communicates specific information, thus, we can say that information is the content of the message. The other level, the infological one, enables to consider information as active. This is subjective information occurring in the context of its user, the problem being solved and the decision-making process. It considers the process of reception of I (K) by user U in the context of task Q being solved, namely I (K, U, Q) (Stefanowicz, 2004, pp. 13-22). Every message carries a content on the datalogical level, and it depends on the user whether it will be possible to read it on the infological level. What is crucial in this perspective is message K which consists of the ordered set of signals being a material vehicle of information.

Based on information theory, the signal is one of the basic terms related to its flow, it notifies about something, transmitting information from the source of the signal to the receiver (Oleński, 2001, p. 75). Signal sensemaking makes a sign of it, which "...*signifies* an object in a given information system (...), namely, it contains specific information if in a given system there is now, there was in the past, or there may be in the future an event, an object, a process or their qualities belonging to the semantic field of this sign" (Oleński, 2001, p. 85).

Pierce (1990) relates signal with sending a message, and information by means of it. This approach is connected with Shannon-Weaver general communication model (Griifin, 2003, pp. 23-56).Within this model, the information source (object) sends a message (through the transmitter (medium) encoding it into a signal), towards the destination (receiver), who, owing to the receiver (signal receiver) decodes it into a message. On the way, the signal mixes with noise, which may hinder its reception and interpretation. Coffman (1997) talks about signals as events during which objects transmit messages during an action or as its result. It is the transmission of an analog or digital pattern via any medium from the sender to the receiver, and the signal receiver can but does not have to be fixed, defined. The message is some information transmitted by its source (sender) which does not have any sense as such, it makes it only on the reception by the receiver and situating it in the interpretational context. The signal does not have to have a specific receiver, that is the object occurring in the environment is a vehicle of information, but it does not have to be addressed to anybody in particular. As Herbig and Milewicz (1996) write, signals are data from which organizations can (but do not have to) draw conclusions. Signals are emitted by objects (they are related to them) in a continuous way, filling the information space, whereas the existence of the receiver is not important. Thus, signaling is more informing than communicating (Martyniak, 1997, pp. 5-6). In such a perspective, transmitting information I(K) is a passive attribute of objects and not their

live action. Only their reception and interpretation by a specific user creates knowledge resulting from the message carried by signal I (K, U, Q).

The message carried by a set of signals indicates its meaning for the user. The message has the same amount of information regardless of the usefulness for the receiver, but it may have different meaning and content for different receivers. Trzcieniecki (1976, p. 131) pays attention to it, stressing semantic and distinctive relations which occur between sign systems while encoding and decoding a message. It is particularly important for making decisions which depend on the level of understanding the decision-making context, and their correctness depends on the compatibility between the information and the decision. He presents the process of transforming the signal emitted by the object into a message (Figure 1).

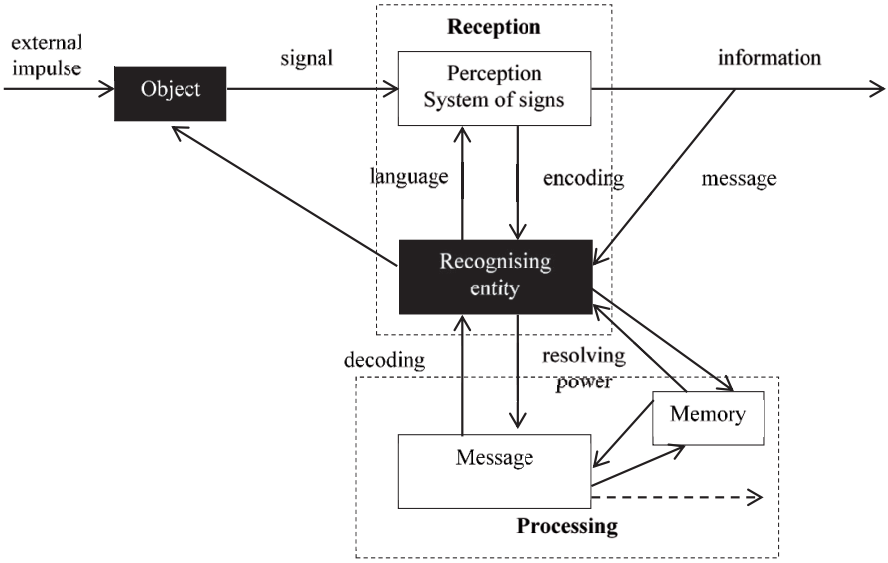

Figure 1. Information process diagram

Source: Trzcieniecki (1976, p. 131).

The task of the realized encoding and decoding processes is to order the sign system effectively, which is supposed to enable correct information processing, which is to lead to an understanding of the information included in the specific message signaled by a specific object. Understanding expresses resolving power which indicates the relation of the unambiguity between the information and the message attributed to it. In the next steps the message is used (or not) to make a decision and initiate an action (Trzcieniecki, 1976,

pp. 130-132). The transformation of signals into knowledge (Figure 2) is a result of two complementary processes: the first one is data ordering and their structuring (the process applying or discovering a pattern), and the other one is their understanding by the user (the sensemaking process).

A specific observer is exposed only to a certain fragment of the environment and pays attention only to some objects in the business environment due to physical and cognitive limitations. In the process, owing to the abilities to influence each other, which is an important mechanism in the process of facing the surrounding world, the user indicates objects in the environment to himself, and in this way manages an action. The indicated signals are extracted from the context, they obtain physical structure and sensing is made, the usefulness of the information carried by them for an action is assessed. Indicating objects and receiving signals is an uninterrupted process of information flow within which the observer perceives signals, assesses them, makes sense (by applying specific cognitive structuring) and gives significance to them, on the basis of which he takes decisions about undertaking a specific action. So that data could become information, the observer has to use the possessed interpretation patterns and by means of words and images to present data and relations among them in the way understandable to others, to enable not only intrapersonal but also interpersonal interpretation. Information becomes knowledge when users formulate and constitute the socially justified belief about their meaning.

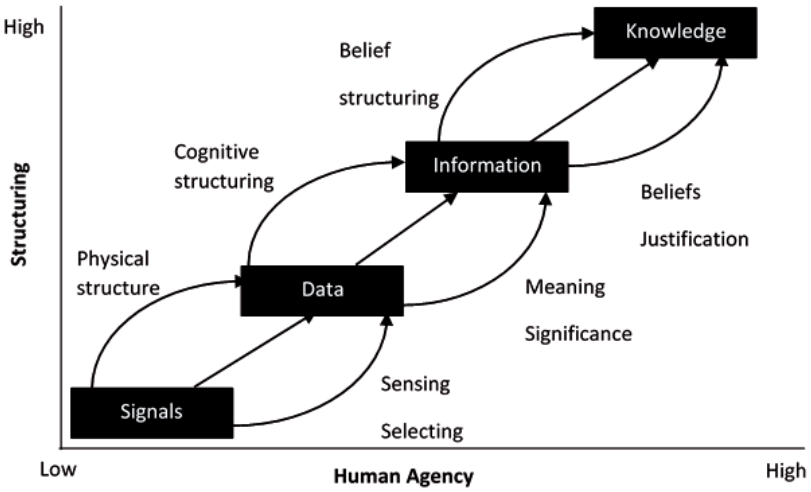

Figure 2. Signals, data, information and knowledge

Source: Choo (2006, p. 131).

To sum up, the signal is any object O which is a material vehicle of message K and transfers information with specific attributes of the object. The notion of the signal is inseparably connected with the notion of the message, and after adding meaning and value, with the notion of information. The information flow is possible exactly owing to the transmission of various types of signals. Information (on the infological level) is related to interpretation processes arising from the reception by a specific user, therefore, information potential of the signal is not constant, and the content of the message can be read variously.

3. Signal strength and the level of the semantic field ambiguity

Every signal is a vehicle for a message which makes sense only on the reception by the receiver and placing it in the interpretational context, namely at the moment of attributing semantic field to it and making a sign out of it. As it was mentioned before, very often signals do not have a specific receiver, that is, objects occurring in the business environment are the source of information, but it is not addressed to anybody. Oleński (2001, pp. 110-112) points to three types of signs in socio-economic systems: (1) natural signs, namely symptoms, (2) iconic signs, namely images (3) commonsigns, namely symbols. The first type of signs (natural signs) are characterized by unintentional formation, and the second and the third type of signs are formed purposefully. In the context of the deliberations on signals, we are interested in natural signs; that is symptoms, not generated intentionally to pass information, but perceived by the receiver as signals informing about something. Thus, any object becomes a symptom (of something), owing to the fact that the receiver perceives it and reaches semiosis (it is conditioned by the occurrence of an object and the observer's knowledge). Without that, a real object (the source of a signal) will not become a symptom, namely a sign being the representation of information. We can talk about three types of symptoms: (1) prospective, (2) retrospective, (3) ongoing. Considering the context of the deliberations, we are interested in prospective symptoms which carry information about the directions of changes (Oleński, 2001, pp. 110-112). Symptoms which constitute signals emitted by objects with the sense made to them are characterized by various level of the semantic field ambiguity. The semantic field of a given sign is unambiguous when: "... in the case of each identified object (...) in a given socio-economic system, on the basis of the semantic principles of a given language we can univocally judge whether the object (...) belongs to the semantic field of this sign, or not" (Oleński, 2001, p. 89). On the other hand, when the field is ambiguous, when: "... we cannot univocally judge whether within a particular system, an object (...) belongs to this semantic field or not" (Oleński, 2001, p.

89). In practice, it is hard to talk about the unambiguous-ambiguous semantic field dichotomy. We should rather talk about the level of the semantic field ambiguity, which is particularly high where the assessment of the sense is based on subjectivity, and (weak) signals are to indicate future discontinuities.

The «weak signals» concept was introduced to management by Ansoff (1975, 1980, 1985) and developed by other authors (Coffman, 1997; Nikander, 2002; Day & Schoemaker, 2005; Ilmola & Kuusi, 2006; Hiltunen, 2008). The idea of «weak signals» is related to Ansoff›s conclusion that changes in the environment are signaled by earlier information transmitted exactly by means of weak signals which are their indicators. He writes about strong signals: «... Issues identified through environmental surveillance will differ in the amount of information they contain. Some issues will be sufficiently visible and concrete to permit the firm to compute their impact and to devise specific plans for response. We shall call these *strong signals issues*" (Ansoff & McDonnell, 1990, p. 20). On the other hand, he writes about weak signals: «... Another issue will contain *weak signals*, imprecise early indications about impending impactful events.(..)but it is not possible to predict with confidence where and when they will occur, nor what specific shape they will take" (Ansoff & McDonnell, 1990, p. 20). In the beginning, signals are unclear, difficult to receive and interpret, and signals are weak. They occur in various contexts and form and do not attract attention as they seem to be insignificant and incompatible with the prevailing way of thinking. Only the lapse of time makes them strong and understandable to everyone. Strong signals are easily noticeable and easy to be interpreted, and they contain clear, understandable information, that is why the assessment of their impact and capabilities or threats arising from them is easy (Gustaffson & Ahola, 2016). Ansoff attributes an anticipatory character to weak signals and talks about them as about certain forerunners, symptoms of changes (signs). What becomes crucial in the identification of the direction of changes in the environment is the use of information coming from weak signals in decision-making processes and their quickest possible transformation into strong signals (the drop of the ambiguity level of the semantic field). A weak signal, being a prospective symptom having an ambiguous semantic field is a medium of the message about the object attributes and enables the identification of possible changes in advance. The possibility of using weak signals in action is the question of the ability to decrease the level of their semantic field ambiguity. Weak signals received today may be a source of information about future changes, because constituting their symptoms which have to be made more precise and detailed in the further process. Owing to the fact that there is usually a delay between their maturing and the moment of becoming the main stream, they give great opportunities to learn, grow and develop.

Weak signals have attributes presented, among others, by Blanco, Caron-Fason & Lesca (2003). They indicate their anticipatory character, qualitative significance, they are ambiguous and fragmentary, and often dispersed. Acquired, collected and processed signals may be a source of information about potential changes, but it is necessary to make them more precise, as the actions that the organization can undertake in reaction to a change in the environment are related to the strength of the received signal. The stronger it is, the more explicit and complete the information is, and the decisions taken on its basis are more rational, at the same time such signals are commonly available and do not constitute a source of knowledge which would lead to building the competitive advantage. It is also connected with the time of their use because waiting until the information is complete and fully adequate to undertake strategic planning leads to strategic surprise, and if the accepted messages are imprecise and fragmentary, their content will be insufficient to undertake detailed planning.

For Nonaka and Takeuchi (2000), knowledge is created by the information flow when it is anchored in the beliefs and commitment of the observer. However, the condition to consider any object a signal is its semantic field which cannot be empty because it makes a sign out of which, which "... signifies an object in a given information system (...), namely contains specific information if in a given system there is now, there was in the past, or there may be in the future an event, an object, a process or their qualities belonging to the semantic field of this sign" (Oleński, 2001, p. 85).

To sum up, weak signals can be defined as signals being prospective symptoms with an ambiguous semantic field. Of course, the division of signals is not a discreet division: strong – weak. We can rather talk about a continuum of which there are signals of various strength. The higher the ambiguity of the semantic field is, the weaker the character of the signal is, the lower the ambiguity, the stronger the signal is.

4. External and internal conditionings of signaling changes in the environment

Objects in the business environment in a continuous way send signals carrying messages which can potentially supply decision-making processes with information (Dutton, Fahey & Narayanan, 1983). They play a crucial role in solving operational and strategic problems since they carry messages containing information about the occurring and potential changes. The signals, however, do not have to have a specific receiver, that is, an object sends a signal being the vehicle of a message, but it does not have to be addressed to anybody in particular (the datalogical level – everything signals something).

Decision -makers can (but do not have to) take decisions and actions with regard to their identification and interpretation (Herbig & Milewicz, 1996) (the infological perspective – we do not identify and interpret all signals).

Objects in the environment are perceived by observers and can be treated as symptoms of discontinuities, but it is necessary to differentiate among the objects themselves and the sensemaking. The weakness of signals has its external and internal sources. The external weakness results from the objectively weak connection among objects in time and space. Objects can, but not necessarily have to, be linked to other objects because, on the reception of the signal, which has the source of its weakness in the environment, it is only a symptom and should be monitored as with time more signals will appear, enabling its more correct interpretation. On the other hand, the internal weakness of the signal occurs when the organization does not notice the links occurring among objects in time and space. To a great extent, it is related to the lack of identification or their wrong identification. Therefore, the weakness of signals appears everywhere where there is an objective vagueness and ambiguity of the links of objects, but also where the links cannot be identified properly.

The problem of external and internal sources of the weakness of signals is described comprehensively by Hiltunen (Hiltunen, 2008) basing on Pierce's semiotic model of the sign. He describes the problem from the angle of the object which signals, representamen which is the form of the sign; interpretant which is an equivalent of the sense made of the signal. In this perspective, the signal is a three-dimensional construct (Figure 3), depicting the trajectory of a change in its strength in the infological perspective, which consists of signal – information and its „visibility"; issue – the number of linked objects; interpretation – the level of understanding.

„Signal" and „issue" are objective (datalogical) dimensions, and „interpretation" is a subjective (infological) dimension. The above model shows the signal transformation process in three coordinated dimensions. An increase in the signal strength (an increase in the level of the semantic field unambiguity) occurs when at least one of the dimensions „increases": the number of visible signals („signal" dimension) or the number of objects linked to the issue („issue" dimension"), or when it becomes more obvious what the weak signal may mean („interpretation" dimension). Within this approach, we deal with objective (datalogical) reality in the form of potential information, yet not all information is received and properly interpreted. Therefore, the subjective reality occurs in the form of active (infological) information.

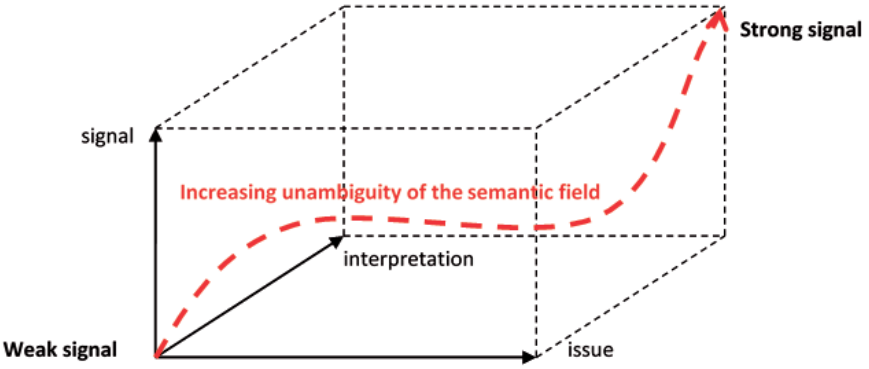

Figure 3. Three-dimensional model of signal strength

Source: Hiltunen (2008).

To sum up, it should be said that the business environment is the source of signals which communicate its changes. The signals are a vehicle of specific information which by means of interpretation are changed into a message indicating its sense for the signal receiver. Within the structuring processes and sensemaking, signals are transformed into knowledge and in this area, one should perceive their usefulness for management – they are the source of knowledge about the environment and the supply for decision-making processes. What deserves special attention are those signals which are weak, have an ambiguous semantic field, are the sign of changes, on which the prospective knowledge about changes in the environment can be built. Their analysis is difficult because they are fragmentary, ambiguous, dispersed, qualitative, incomplete and mixed with noises. Therefore, it is crucial to understand their implications for the organization, which is fulfilled by collecting other signals and information and an attempt to interpret them better. The signal strength changes and the signal which is initially weak becomes stronger with time, at the same time leading to the reduction of the selection of possible decision-making options and pushing organizations towards a crisis situation. The direction, speed and character of the transformation of weak signals into strong signals is determined by external and internal sources of weakness.

5. Conclusions

The capability of an organisation of recognising changes in the environment in the infological perspective is conditioned, among others, by such factors

time the decision-maker has from the acquisition of information to the necessity to make a decision; the knowledge resource which determines the way of interpreting the signal; the context conditioning the attention of the decision-maker and information processing; the emotional state influencing the equilibrium of datalogical (objective) and infological (subjective) perspective of decision-making; the circumstances of acquiring information, which influence the interpretation of information (Stefanowicz, 2004, pp. 20-21). It should always be ensured that information in the information and decision-making system is both objective (potential) and subjective (active). In the infological perspective, which focuses on information as the content provided by the signal, the distinction between the datalogical level and the infological level allows me to understand the meaning of both the processes of obtaining information and the processes of processing it, leading to decision-making. Organizations which want to improve the effectiveness of those processes, have to extend the scope of the observations of the environment to increase the access to potential information, and in the process of its identification rely on sources which are "rich" in information – external and personal one. On the other hand, in the interpretation process, the received potential information should be subject to as broad analysis and processing as possible, both inside and outside the organization in order to consider a plurality of cognitive perspectives, make the most adequate interpretation of it. Obviously, the process is complex and efficient systems recognising changes by means of the transformation of potential information into active one must overcome the existing barriers, both on the individual level (cognitive limitations, exploration of periphery, exploration and scope of scanning the environment), the group level (challenging the assumptions, increasing interactions between interpreters, differentiating cognitive perspectives), as well as the organisational one (building adequate information culture, systemic solutions), and the entirety boils down to equalise objective weaknesses and subjective conditionings of the process of building knowledge about changes.

References

Ansoff, I. (1975). Managing strategic surprise by response to weak signals. *California Management Review, 18*(2).

Ansoff, I. (1980). Strategic *Issue Management*. *Strategic Management Journal*, *1*(2).

Ansoff, I. (1985). *Zarządzanie strategiczne*. Warszawa: PWE.

Ansoff, I., & McDonnell, E. (1990). *Implanting Strategic Management*. New York: Prentice Hall.

Blanco, S., Caron-Fason, M-L., & Lesca, H. (2003). Developing capabilities to create collective intelligence within organizations. *Journal of Competitive Intelligence and Management*, *1*(1).
Choo, Ch. W. (2006). *The Knowing Organization*. New York, Oxford: Oxford University Press.
Coffman, B. S. (1997). Weak Signal® Research. *Journal of Transition Management*, Winter.
Day, G. S. Schoemaker, P. J. H. (2005). Scanning the periphery. *Harvard Business Review*, November.
Dutton, J. E., Fahey, L., & Narayanan, V. K. (1983). Toward understanding strategic issue diagnosis. *Strategic Management Journal*, *4*(4).
Griifin, E. (2003). *A First Look at Communication Theory*, New York: McGrawHill.
Gustaffson, R., & Ahola, E. (2016). *Exploring a New Generation of National Technology Programmes – Weak and Strong Signals on Roles and Goals*. Retrieved from http://www.segera.ruc.dk.
Herbig, J., & Milewicz, J. (1996). Market signaling – a review. *Management Decision*, *34*(1).
Hiltunen, E. (2008). The future sign and its three dimension. *Futures, 40*(3).
Ilmola, L., & Kuusi, O. (2006). Filters of weak signal hinder foresight: Monitoring weak signal efficiently in corporate decision-making. *Futures*, *38*.
Martyniak, Z. (Ed.). (1997). *Elementy zarządzania informacją i komunikacją w przedsiębiorstwie*. Kraków: Wydawnictwo AE.
Nikander, I. O. (2002). *Early Warnings. A Phenomenon in Project Management*. Helsinki University of Technology.
Nonaka, I., & Takeuchi, H. (2000). *Kreowanie wiedzy w organizacji. Jak spółki japońskie dynamizują procesy innowacyjne*. Warszawa: Poltext.
Oleński, J. (2001). *Ekonomika informacji*. Warszawa: PWE.
Pierce, J. R. (1990). *An Introduction to Information Theory. Symbols, Signals and Noise*. New York: Dover Publications.
Stefanowicz, B. (2004). *Informacja*. Warszawa: Oficyna Wydawnicza SGH.
Trzcieniecki, J. (Ed.). (1976). *Podstawy teorii organizacji i zarządzania.* Kraków: Wydawnictwo AE.

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RESISTANCE TO RESTRUCTURING CHANGES IN COMPANIES WHOLLY OWNED BY THE STATE TREASURY

***Jerzy Choroszczak*[1]**

Abstract
This paper shows the crucial problem of the resistance to restructuring changes in companies wholly owned by the State Treasure. The primary goal of the author was to identify the causes and consequences of resistance to change in these companies wholly owned by the State Treasure. The following paper presents results of the research conducted by the author in a large corporation wholly owned by the State Treasury.
Keywords: *resistance to changes, restructuring changes, companies wholly owned by the State Treasure.*

1. Introduction

Organizational changes, especially the restructuring ones carried out in companies wholly owned by the State Treasury often encounter a strong resistance of the employees as well as part of the executives which frequently leads to undesirable effects of the restructuring changes. Resistance to such changes in companies wholly owned by the State Treasury is unique and differs from resistance to change in private enterprises, featuring more complex nature. The strength of this resistance will depend on many factors associated with both the specifics of the relevant change and details of the enterprise itself and relations between the employees of the company.

The main objective of this paper is to investigate such resistance to the restructuring changes in companies wholly owned by the State Treasury. The intention of the author was to analyze the sources of resistance, its specifics, and implications for the functioning of the company wholly owned by the State Treasury as well as ways to minimize negative effects of the resistance. The following paper presents results of the research conducted by the author in a large company wholly owned by the State Treasury. The management of this company did not agree to reveal its name; therefore, it will be renamed into ALFA in the following paper.

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2. Essence of the restructuring changes in companies wholly owned by the State Treasury

The State Treasury companies are a type of business set up by Minister of State Treasury at the request of the founding body, namely director of the state-owned company, work council or on their own initiative. On the one hand, such companies are subject to general rules laid down by the provisions of the commercial companies code, while on the other hand, they have quite specific characteristics that distinguish them as compared to other companies – private ones (Choroszczak, 2015, p. 56). The source of specific characteristics of such companies is the shareholder – the State Treasury. In companies wholly owned by the State Treasury the State owns 100% of the shares and has full control over them.

Initially, the legal form of the company wholly owned by the State Treasury was supposed to be a transitional form of the organization preparing state-owned enterprises for privatization. The unlimited time of the functioning of companies wholly owned by the State Treasury was established based on the passed act on commercialization (Czerwińska, 2002, p. 5). In such companies wholly owned by the State Treasury, a highly strong resistance to changes, the restructuring ones, in particular, takes place very often. To be able to understand the causes and specifics of this resistance it is essential to study the phenomenon of the restructuring processes occurring in companies wholly owned by the State Treasury. Generally speaking, the restructuring is a radical reconstruction of the company. It can be carried out in almost all areas of the company starting from the core business, through production technology and structure of the company and ending with the organizational and legal form of the enterprise. The source literature presents very different approaches to the restructuring changes:

- Restructuring is a process of fundamental and serious changes more extensively caused by external factors, or otherwise critical situations in the development of structures affected (Borowiecki & Kwieciński, 2001, p. 11).
- Restructuring is a strategy for the growth of the economy, sector, and enterprise (Grudzewski & Hejduk, 2000, p. 21).
- Restructuring is a strategic process leading to maximizing the value of the sector and enterprise (Kaczmarska, 2007, p. 14).
- Restructuring is a rapid change in assets of the company, capital structure and organizational structure (Kupczyk, 1998, p. 17).

Thus understood, the restructuring will affect particular changes. These are changes of radical, fundamental and groundbreaking character for the operation of the company (Borowiecki & Nalepka, 2003, p. 43). It can, therefore, be concluded that any restructuring is a change, but not every

change is the restructuring. Radical changes carried out in the process of the restructuring include:

- reformulating the mission, goals and core values of the company,
- changes in the management structure,
- reorganization (changes in the organizational structure, systems, and procedures),
- changing the organizational links (processes, information network, decision-making system).
- replacing part of the personnel (Grudzewski & Hejduk, 2000, p. 27).

Considering the specifics of the restructuring processes in companies wholly owned by the State Treasury, one can indicate some specific features of these methods.

Firstly, the restructuring processes held in such entities must be carried out relatively quickly because these entities often face a challenging financial situation which is usually characterized by developed pathological processes and also because, as Sapijaszka (1997) rightly believes that changes implemented slowly and gradually increase the risk of being subjected to pressures and political turmoil of various stakeholders, and promote intensification of organizational inertia, very strong in companies wholly owned by the State Treasury. The protracted destabilizing radical change will only increase the resistance of the employees with regard to changes therefore, such changes should be implemented as soon as possible.

Secondly, such changes have to some extent break with the past as they must be 'fresh', revolutionary and innovative because only such changes will increase adaptation of the organization to the changing market and the likelihood of success of the enterprise. These changes cannot be restructuring changes in name only. The more these changes resemble the changes that have already been introduced by the company and as a result led it to the state of crisis, the smaller probability that the company will deal with the crisis.

Naturally, fundamental and radical change is not a sufficient condition in the restructuring process. It must be a beneficial change which will adapt the enterprise to conditions in its environment and positively affect its competitive position.

Restructuring changes held in companies wholly owned by the State Treasury are carried out for quick adaptation of the enterprise's strategic potential to the expectations of the environment in order to eliminate or reduce an enormous huge strategic gap in this matter. Restructuring is an adaptive and reactive change aimed at complying the enterprises in crisis with changes occurring in the environment by means of radical measures. Restructuring processes are carried out when the company for a extended period of time neglected the process of permanent monitoring and adapting to the market.

Also, there has been a significant failure concerning the adjustment of internal processes to the requirements of the environment, and this situation very often takes place in companies wholly owned by the State Treasury. In this case, in the face of increasingly intense external changes, gradual and slow changes will make the company not keep pace with these external changes, and what is more, the company will continue to 'move away' from the environment instead of adapting. Only a quick change is required in such situation that will lead the enterprise back to a state of balance with the environment and to the fact that the process of adaptation will be possible again to be done by smaller gradual changes. The greater strategic gap between internal objectives of the company and expectations of the environment, restructuring changes should be quicker and feature radical character.

Another feature of the restructuring changes of companies wholly owned by the State Treasury is their strategic dimension associated with the economic objectives of the country. The direction of the restructuring should be to change the strategy of the company and the related systemic reconstruction of the organization and principles for the functioning of the company in order to achieve a long-term competitive advantage. This strategic restructuring change is imposed by an external entity, namely Minister of the State Treasury. Main, above restructuring objectives, in this case, are not built from the bottom by the employees of the company wholly owned by the State Treasury.

Such authoritatively imposed restructuring will require changes in the company's mission, objective goals, search for competitive advantages, and therefore basic elements of the strategic management process. The strategic dimension of the restructuring processes is also reflected in expanding or limiting the area of the company's activities, and what follows, it concerns the strategic choice of one of two main development directions of the enterprise: specialization and diversification. This choice, however, is imposed and controlled by the external entity.

Another feature of changes held in the restructuring process of companies wholly owned by the State Treasury is their complexity and various aspects. Restructuring changes of such entities should often be deep, 'structure breakers' concerning the most important parts of the organization. Authority in the field of the restructuring processes Prof. H. Singh when defining the restructuring often highlighted its extremely complex nature. His interpretation of the restructuring meant 'a rapid change in the assets of the company, capital or organizational structure (Singh, 1993). This change may involve a broad range of transactions starting from acquiring new areas of the activity, selling part of the company, changing capital structure through increasing debt and ending with the internal changes of the company's organization.

The complexity of the restructuring changes carried out in companies wholly owned by the State Treasury is also influenced by extensive and very often complicated relations between shareholders in such companies. Cooperation with shareholders in the restructuring process of the enterprise will mean the search for a convention between interests of many entities. It will allow to implement the restructuring program effectively, maximize profits and minimize losses in individual groups of shareholders (Porada-Rochoń, 2009, p. 40).

Another feature of the restructuring changes is their systemic nature resulting from the fact that these changes have, as already mentioned, complex and multi-dimensional character. Changes made in the restructuring process in one of the restructuring areas generally involve adaptive changes in other fields of the company's operation.

Restructuring changes described above can be an effective response made by the company wholly owned by the State Treasury to the crisis and the base for long-term development of the enterprise if precisely planned, very carefully prepared, consistently carried out in accordance with previously developed objectives and controlled. Under no circumstances may the restructuring be an uncoordinated and accidental process because the results will be short-term and partially useful, bringing at best ad hoc improvement in the effectiveness of the company's operation. It is also necessary not to treat the restructuring as an end in itself but as a means to achieve objectives of the organization. In addition, it must be emphasized that the restructuring involves not only 'hard' field of business management and material activity but also includes changes in the 'soft' elements of the management, Also, it indicates changes in the sphere of awareness of the employees which is very often forgotten in the restructuring processes of companies wholly owned by the State Treasury.

3. Resistance to restructuring changes

Any modification, to a greater or lesser extent, carries a risk and uncertainty when it comes to its influence and results for individual components of the organization. Primarily, this change will always raise natural resistance among employees of the organization, due in part to the very nature of organizational changes that in most enterprises are not natural. Usually imposed on the employees authoritatively and everything that is imposed may be a source of the opposition of people operating in the enterprise. Their fear of the change which always involves uncertainty, the comfort of the employees and fixed habits inhibit and make difficult to introduce changes in the enterprise and raise resistance. This resistance to changes as rightly noted by P. Senge: *"...*

almost always arises from the hazards of traditional standards and proved methods for carrying out specific tasks." (Senge, 1990, p. 88)

Analysed resistance to changes is one of the most difficult issues associated with the change management process. It is an integral part accompanying changes. It can generally be said that the size of the resistance is proportional to the size of changes introduced in the organization. The resistance increases as changes are implemented, however, after reaching a peak point it starts to decrease.

The essence of the phenomenon of resistance can be characterized as a prevention of the implementation of a new, different order in the organization. In other words, these are all forces seeking to ensure that the change does not occur. Every organizational change involves shaping new situation, other conditions for the employees different from those they already got used to. It is a kind of a unilateral termination by the organization of the existing terms of the contract which was the result of previously achieved balance between services and expectations of both parties: institution and its members. Resistance occurs when new conditions are perceived by people as less favorable than the previous ones (Czerwiński, Czerska, Nogalski, Rutka & Apanowicz, 2002, p. 520).

When considering nature of the resistance to changes, one can take advantage in this matter of field theory by K. Lewin, according to which the behavior of the organization is the result of the impact of both forces pressing for changes and those inhibiting them. Positive forces are pressing and stimulating the introduction of changes to include inventions, competition, new materials, innovative technologies.. In contrast, forces inhibiting the process of changes are fear, group norms, and self-satisfaction. The greater impact of inhibiting forces, the smaller scope, results of implementing changes in the organization and greater elimination of positive effects caused by stimulating forces. If the forces supporting changes do not overcome those that cause resistance, the change itself will not have a reason to exist or will bring very little results. Considering the resistance to changes, their size and implementation time, one can come to two conclusions:

1) Proportionally to the scale size growth, the resistance increases and therefore the risk, uncertainty, need to pay more time and energy to employees for learning the process of changes increase.
2) Resistance to changes increases when a period for implementing organizational changes by the employees is shorter. The more rapidly introduced changes and in a shorter period of time, the employees have less time to get familiar with these changes and adapt to them. Changes introduced so quickly are often a shock to the employees and increase their reluctance to the process of changes.

Naturally, the attitude of the employees towards changes in the organization are not static as they evolve, transform as the process of changes progress and its effects are visible. Usually, at the beginning of the process of changes, the employees experience a kind of shock associated with something new, unknown, arousing fear, while next stage involves caution, defensive withdrawal to finally get used to the change, accept it and adapt. It can be stated that resistance to changes and negative attitude of the employees will decline as the changes will take visible and positive shape as well as bring positive results. The level of employee involvement will grow as time passes and the transition from the phase of prevention and acceptance to the phase of adaptation and assimilation.

On the other hand, when identifying outbreaks of resistance and its causes and analysing variety of their different classifications found in the literature it must be said that all kinds of sources of the resistance can be reduced to two basic groups: sources of the resistance arising from human nature and sources of the resistance caused by the very nature, specifics of the change.

The source of resistance to organizational changes can be primarily human nature of its own, natural anxiety of the unknown and fear. According to Daryl Conner, fear, anxiety, and loss of control during the process of changes are such strong feelings that demobilize most of the employees and suspend their actions even when the prospects for them are extremely beneficial. When destroying former order and system, changes are naturally the source of negative reactions. Everything that is new and foreign to human nature must raise concerns of the employee about his future towards changes introduced in the company. Each change always puts a man in a new situation that he had never been before and will have to find his place in a new reality. Perhaps, as a result, he can gain but also lose as rightly noted by Clarke (1997, p. 151), a change usually divides people into winners and losers. The greatest resistance occurs among employees who believe they will be in the latter group. This formation of the resistance, the source of which are employees depends undoubtedly on how much they have invested in the old ways of operation and how much they had to learn to function in the organization concerned. The more effort they put, the greater resistance to the new.

Vital issue in discussing sources of the resistance arising from human nature is the level of security or its lack among employees. If the employees do not feel safe enough in the company's concerned or when they know that the company fired in the past employees for errors they made, they will obviously resist any changes as a result of which they will have to learn from the scratch and thus the risk of errors and dissatisfaction of the management will immeasurably increase. A similar situation will take place in case of many people with long experience who already have a well-established position and

a great sense of security. Then, their resistance to changes will be relatively high. The point is that too high sense of security, as well as a high sense of insecurity, are not conducive to the process of change. That is why it is important as noted by Clarke: *"to control tension between security verging on inertia and insecurity verging on psychological risk"* (Clarke, 1999, p. 37). Specific balancing with the level of security may have a significant impact on the actual strength of the resistance to change. The idea is that on the one hand, employees are convinced that the organization is in a very difficult situation and that this situation will negatively affect employees so that they feel a kind of pressure of action. On the other hand, that these employees feel confident, be in a safe environment which does not punish immediately and severely with a proverbial stick because this disheartens employees from taking any initiatives. All sources of resistance associated with human nature can be divided into personal and sources inherent in the interaction of a social group.

Personal sources derive from individual attitudes, fears of every employee to changes in the organization. Each of the employees has a slightly different way of responding to change and reacting to stress associated with the process of transformation in the company. Shape, size, and strength of the resistance arising from this type of sources will be influenced by such factors as age, tolerance of uncertainty, the level of self-confidence, experience in relation to the effectiveness of changes, position in the company. Such personal sources can also include:

- fear of 'losing face' against new tasks, anxiety that new tasks will surpass the employee,
- concern about one's own competencies whether they will be useful after changes,
- fear associated with increased workload, the fact the change will require more energy, time and learning,
- negative experience from the past associated with changes, their negative results and unfulfilled promises.

Resistance arising from this source of human nature can furthermore by dictated by habits and routine of the employees, abandoning previous habits and behavioral patterns. Sometimes it is easier to learn something from the very beginning than to get rid of old habits. One can, therefore, conclude that the strength of the resistance is proportional to the length of service and occupying a specific position.

The social sources of resistance involve the pressure caused by a formal or informal group of co-employees, faith and loyalty of the individual to the group. The driving force behind this type of resistance to change is the fear that the change will violate interests of the group as a whole or someone from the group. In this case, solidarity with the group or even fear of exposure to

the group will result in joining the process even if the individual concerned does not feel the fear of the change. This source is particularly strong in large enterprises with extensive organizational structure and relatively large organizational units and additionally favored by a relative stability of employment, low employee turnover and thus creation of strong ties between these employees.

The source of resistance featuring social nature is also inconsistency with applicable standards or cultural values followed for a longer period of time by a group in the company and the fear that this change will destroy these values and standards. As rightly noted by Senge (1999, p. 134), these standards followed by a group are often woven into the structure of the existing map of influences and mutual interaction, and therefore often give rise to such resistance to change. A strong position of trade unions in organizations is undoubtedly an element strengthening this kind of source of the resistance. This type of social factors resistant to change may also result from a lack of faith and loyalty of the employees to their superiors. Employees may be concerned about the real intention of managers implementing changes and the fact that these managers primarily will have the right interest of the organization in mind, and then the employees themselves. These concerns can be additionally strengthened with doubts whether the superior has sufficient power and position to represent the interests of his subordinates effectively. The impact of this source of the resistance is therefore inversely proportional to the actual authority of the supervisor. Sources of the resistance inherent in nature of the change relate to its content, deep and scope as well as expected future effects of the change, its influence on the level of satisfying needs. The more deep, overall and revolutionary than evolutionary is change to be implemented, the greater concern and resistance. In addition, resistance to change will be greater if it will take interests of the employees and satisfy their needs to a lesser extent.

The process of carrying out changes can also be a source of the resistance. Such factors involved in this matter as sources of the resistance is a discrepancy in the assessment of the situation and resulting lack of awareness of the need to change. Also, errors associated with informing about the process of implementing changes, misleading, incomplete or delayed information will undoubtedly increase the resistance of the employees to changes. As emphasized by Czerska, this type of the source of resistance is also negative evaluation of introducing the process of changes. This assessment may result from the improper moment of introducing changes in the enterprise, without proper preparation of conditions, or during a period of particularly strong tensions and conflicts in the organization concerned.

4. Causes and consequences of the resistance to the restructuring change in ALFA company wholly owned by the State Treasury

The primary objective of the study was to examine the specifics and intensity of the resistance to the restructuring changes in selected company wholly owned by the State Treasury. Specific objectives included: identifying causes of the resistance formation to the restructuring changes and its effects in ALFA company wholly owned by the State Treasury. In addition, the specific objective was to identify a way to minimize resistance to the restructuring changes. The research was conducted in large company wholly owned by the State Treasury which employs over 300 people. Due to the fact that the management did not agree to disclose the name of the enterprise, its name in the following paper has been changed.

The company subjected to analysis has a/the difficult economic situation, the financial result is negative due to the rising costs and decreasing revenues generated by an increasingly smaller number of customers which is a result of poor quality of the services provided by the company. Currently, the company is at the stage of carrying out a radical restructuring aimed at reconstructing the scope of company's business towards greater product diversification (the goal is to minimise the business risks in two closely related sectors with a high seasonality of sales) combined with a thorough technological modernisation (the company has outdated and inefficient manufacturing line from the 60's) and the reconstruction of the organizational structure.

The research was carried out based on interviews with employees of the company and the author's observations made during his internship in the company wholly owned by the State Treasury. The study was conducted on a group of 31 respondents – office and manual workers. Interviews with the employees of the company were carried out on the basis of previously prepared issues and questions: open and closed. For the purpose of the interview, the author developed 18 questions and issues concerning resistance to the restructuring changes in selected company wholly owned by the State Treasury.

The first three issues subjected to research and included in interviews focused on the specifics of the restructuring processes in the company under research. In the first question "*How do you perceive changes implemented in the company?"* the vast majority of respondents, namely 27 replied that the changes are necessary for the company, even those that will be painful for the employees. High compliance of the respondents as to the need for changes in the company under research shows that the company is currently in a difficult situation requiring immediate repair, while changes introduced so far have not produced expected effects. The need for changes can be proved by the fact that respondents agree even on such changes, which will be painful for them. In

this matter, there is a high awareness of the employees as to the necessity and inevitability for change and acceptance of different, including even negative effects of carrying out these changes. This attitude of respondents can also suggest a slight intensity of resistance to the restructuring changes.

In the second question "*What type of the restructuring changes is or was recently carried out in your company?"* also the majority of respondents stated that:

- these processes are primarily related to exchange of the personnel (dismissals, 'rejuvenation' of the staff),
- reformulation of goals and values of the enterprise (including introduction of quality orientation on products and services provided by the enterprise,
- focus on effective implementation of tasks and care for the costs aspects of the enterprise),
- changes within the authority structure (frequent changes in the board of management and thus changes in directorship positions),
- changes in the field of activity as areas of the restructuring processes were pointed to a lesser extent (expanding the existing production and service activities with a new business area regarding the organization of cultural events).

Changes given by respondents are perceived by them as more fragmentary and superficial rather than comprehensive. This fact is evidenced by responses to the third question of the interview "*What are the effects of changes occurring in your enterprise?"* Results of these changes are minor and mostly beneficial for selected groups of the employees.

When describing performed restructuring changes, respondents emphasized the time pressure on their implementation and, on the other hand, the lack of consistency in the implementation of the restructuring changes. These changes are very often not completely implemented. The reason for this state of affairs is frequent changes of the board of management and senior executives. A large group of respondents highlighted that the changes made in the enterprise are small and do not bring anything new to its situation. Such changes are superficial and illusory and are restructuring in the name only. As mentioned in the first part of this paper, changes should break with the past and should feature a revolutionary and fundamental character.

Another question concerned the opinion of respondents on changes introduced in the enterprise. The question was worded as follows: "*What is your general attitude to changes implemented in the enterprise?"* Almost everyone (except only three people: two of them have expressed indifferent attitude, and one turned out to be the opponent of the changes) presented themselves as proponents and showed a positive attitude to the changes. Such attitude suggests that the resistance to change will be small. However, the answer to another question

whether the respondent came across other employees who are opponents of the changes was not so unequivocal. 15 respondents replied that they experienced in their work resistance to change expressed by other people. This answer may suggest that the resistance phenomenon in the company under research is present.

The next question related to concerns and fears of new processes and changing occurring in the company under research. The question formulated in this area was worded as follows: "*What is your greatest fear when changes are introduced in your workplace?"* Employees fear above all dismissals, increase in difficulty and complexity of work and thus the need to improve their qualifications. These concerns are largely dictated by the fact that respondents are individuals predominantly in the age of 50+, inflexible, narrowly specialized with a long experience in one workplace. Such people inevitably will be afraid of the changes associated with performing new tasks and work. The least people expressed their concerns associated with changes in the need to work with other people, loss of impact and decline in earnings. This can be justified by the fact that respondents of the study are mostly people with low earnings, not occupying executive positions. Interestingly, also a person holding a managerial position stated that decline in earnings associated with the organizational changes is not the source of concern, which may suggest that salaries in managerial positions are not attractive enough to become a fear of their decline due to the changes carried out in the enterprise.

In the question "*What do you want and expect once the process of carrying out changes in the enterprise is completed?"* (they could provide several expectations, most respondents (22 people) said that financially better employment conditions, then stability of employment (20 people) and the promotion and ability of real influence on the existence of the enterprise (9 people). Few people expected the possibility of raising their competencies and a chance to work with other employees.

Another question related to sabotaging decisions of superiors and forms of such behavior. This question was worded as follows: "*Do you sabotage decisions concerning changes or feel that other people sabotaged your decisions?"* Employees subjected to the study overwhelmingly stated that they happen to sabotage decisions concerning changes taking place in the enterprise. Forms of the sabotage primarily include using sick leave, work at a slower rate, denunciations on superiors who initiate or implement changes in their departments. This situation shows, however, that the changes implemented in the company under research have their opponents and that the resistance to change can take place in the company under research and has its more hidden form. Employees who presented themselves as proponents of the changes are at the same time people who are able to sabotage decisions and actions associated with the changes in the enterprise.

This dissonance may also result from the adopted by the management of the company wrong direction and method for carrying out changes and from the fact that the changes adopted in the company are not accepted by the employees, even those who promote themselves as supporters of changes.

The consequences of this state of affairs can be traced in response to another question asked to respondents during interviews "*Do executives before introducing the restructuring changes provide accurate information about their causes, objectives, method of implementation and positive aspects?"* Almost all respondents answered that rarely or never. This situation of poor or no communication associated with the implementation of the restructuring changes may give rise to the resistance and incomprehension of changes as well as be the cause of sabotage by the employees.

Also, the answer to the next question may be evidence that changes implemented in the company under research could face resistance resulting from the improper method for implementing the restructuring changes. The next question was formed as follows: "*What means were most often used in your enterprise to minimise potential resistance of the employees to change?"*. The majority of respondents replied that the consent to the implementation of changes was forced, repercussions or penalties in the form of reprimands as well as dismissals or degradation to a lower position were used. Direct participation in the project associated with changes or negotiations with the employees concerning a form of implementing changes were adapted much less frequently.

To the question: "*Does an incentive system associated with the process of implementing changes is applied in the company under research?"* two-thirds of the employees provided a negative response. One-third of the study group said that the employees are motivated by extending their rights and their responsibilities.

Another issue taken into consideration in the research was the role of trade unions in the process of introducing the restructuring changes. In the company wholly owned by the State Treasury which is the subject of the research, there are two trade unions which in the opinion of respondents compete with each other for influence in the enterprise. Their role is evaluated by the majority of respondents negatively. Trade unions generally show a negative attitude to changes initiated by the management in the enterprise and are reluctant to cooperate in the implementation process of these changes. Only three respondents said that trade unions depending on the nature and scope of the restructuring changes take a flexible approach, provided that they can get benefits.

The last issue in the research was to analyze ways in which employees of the company under research cope with conflict situations arising from carrying out the restructuring changes. In this case, the main way to deal

with conflict situations with the source as a change turned out to be a rivalry between employees and interdepartmental rivalry. Such answer was given by two-thirds of respondents. Another method involved negotiations. The smallest number of the employees indicated cooperation and the search for a compromise. The situation in which the employees primarily compete with each other in the face of the implementation of the restructuring changes, and not cooperate and search for a compromise which is something that would join these employees instead of separating them is a situation which may further increase resistance to change. Competition is a way of looking at conflict as a game that must be won in order to achieve success. Failure indicates weakness and loss of prestige. Any change that involves competition which will result in failure of one of the parties will trigger negative feelings and the resistance of those who may feel weaker and threatened by the competition.

5. Conclusions

Resistance to the restructuring changes in the company wholly owned by the State Treasury which is the subject of the research turned out to be only seemingly weak. Despite the declaration made by surveyed employees as supporters of changes and high awareness of the need for the implementation of the restructuring changes, most of the employees sabotage in different ways decisions and actions associated with the restructuring changes carried out in the enterprise. In addition, they come across the resistance from their colleagues. The reason for this state of affairs may be the lack of acceptance of methods and forms used for carrying out the restructuring changes in the enterprise, weak incentive system supporting the restructuring changes in the enterprise and no reliable information on the objectives of changes and profits resulting from the implementation of the restructuring changes. The cause of resistance to the restructuring changes in the company wholly owned by the State Treasury which is the subject of the research can also be the anxiety of the unknown and fear which involves greater effort and energy as well as acquiring additional new skills, which may be in the eyes of older employees a serious problem. These issues are also highlighted in the research. Resistance to the restructuring changes may also derive from the fact that personal expectations of the employees when it comes to the restructuring changes signalled by them in interviews are not met as a result of implementing changes. Employees do not see the connection between their goals and needs and goals which guide organizational changes. Employees in the enterprise fear above all dismissals as a result of implementing the restructuring changes and this may be in conflict with the restructuring changes the effect of which will be such dismissal.

Another source of the resistance particularly characteristic for companies wholly owned by the State Treasury can be trade unions which in the company under research are not willing to cooperate in implementing the restructuring changes. Such unions can initiate or incite resistance to changes which were also indicated by respondents in the research. Next identified source of resistance to the restructuring changes can be repercussions accompanying the restructuring changes, low level of security of the employees, forcing consent to implementing changes, not taking into account opinion of the employees, authoritative initiation and implementation of the restructuring changes which are perceived by the employees as 'their changes' and not 'our changes'. Another source of resistance can be rivalry accompanying the restructuring changes which inevitably leads to the division of two parties into winners and losers. Fear of failure and one's own weakness may give rise and incite resistance to the restructuring changes.

In addition to unrealized or partially realized objectives of the restructuring changes, results of such presented resistance include low productivity, high absenteeism of the employees, simulating work associated with the restructuring changes, mutual denunciations of the employees on each other as well as an increase in conflict situations at work. The way to overcome diagnosed resistance is primarily a proper two-way communication, executives treating employees as partners, preparing changes in consultation with employees and developing an appropriate incentive system associated with the results of the restructuring changes. It can be concluded that employees of the company wholly owned by the State Treasury which is the subject of the research are open to changes, understand the importance and necessity of their implementation in the company, while the specifics and authoritative way of implementing the restructuring changes may effectively cool the openness and enthusiasm of the employees for the implementation of changes and contribute to the emergence of resistance to the restructuring changes.

References

Borowiecki, R., & Nalepka, A. (2003). *Restrukturyzacja w procesie funkcjonowania i rozwoju przedsiębiorstw*. In: R. Borowiecki (Ed.), *Zarządzanie restrukturyzacją procesów gospodarczych. Aspekt teoretyczno – praktyczny*. Warszawa: Wydawnictwo Difin.

Borowiecki, R., & Kwieciński, M. (2001). *Zarządzanie zasobami informacji w przedsiębiorstwie. Ku przedsiębiorstwu przyszłości.* Warszawa: Wydawnictwo Naukowo-Techniczne.

Clarke, L. (1997). *Zarządzanie zmianą*. Warszawa: Wydawnictwo Gebethner & Spółka.

Choroszczak, J. (2015). *Symptoms of Organizational Pathology in Companies wholly owned by the State Treasure*. In: A. Nalepka & A. Ujwary-Gil (Eds.). *Business and Non-profit Organizations Facing Increased Competition and Growing Costumer's Demand,* Volume 15th (pp. 23-38). Nowy Sącz: Wyższa Szkoła Biznesu – National Louis University.
Czerwińska, Ewa. (2002). *Jednosobowe spółki skarbu państwa*. Warszawa: Kancelaria Sejmu – Biuro Studiów i Ekspertyz.
Czerwiński, A., Czerska, M., Nogalski, B., Rutka, R., & Apanowicz, J. (2002). *Zarządzanie organizacjami*. Toruń: Towarzystwo Naukowe Organizacji i Kierownictwa Stowarzyszenie Wyższej Użyteczności Dom Organizatora.
Grudzewski, W., & Hejduk, I. (2000). *Restrukturyzacja firmy jako kierunek wzrostu jej wartości.* Lublin: Zeszyty Naukowe Uniwersytetu Marii Curie-Skłodowskiej.
Kaczmarska-Krawczak, J. (2007). *Globalizacja i integracja gospodarcza a procesy restrukturyzacji i rozwoju przedsiębiorstw. In:* S. Lachiewicz, M. Matejun (Eds.). *Problemy współczesnej praktyki zarządzania.* Łódź: Wydawnictwo Politechniki Łódzkiej.
Kupczyk, A. (1998). *Radykalne zmiany w firmie. Od reengineeringu do organizacji uczącej się.* Warszawa: Wydawnictwo Prawno-Ekonomiczne Infor.
Lis, R. (2003). Restrukturyzacja przedsiębiorstwa. *Przegląd Organizacji*, *9*.
Suszyński, C. (1999). *Restrukturyzacja przedsiębiorstw*. Warszawa: Polskie Wydawnictwo Ekonomiczne.
Sapijaszka, Z. (1997). *Restrukturyzacja przedsiębiorstwa. Szanse i ograniczenia,* Warszawa: Wydawnictwo naukowe PWN.
Porada-Rochoń, M. (2009). *Restrukturyzacja przedsiębiorstw w procesie adaptacji do współczesnego otoczenia. Perspektywa międzynarodowa*. Warszawa: Difin.
Singh, H. (1993). Challenges in researching corporate restructuring. *Journal of Management Studies, 30*(1), 147-172.
Senge, P. (1990). *The Fifth Discipline: The Art. And Practice of the Learning Organization.* New York: Doubleday.

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II.
MODERN TOOLS FOR BUSINESS AND NON-PROFIT ORGANIZATIONS MANAGEMENT

HOW VIRTUAL ARE VIRTUAL TEAMS? REVIEW OF SELECTED DEFINITIONS AND MEASUREMENTS OF THE VIRTUALITY

***Magda Ferretti*[1]**

Abstract

People nowadays very often work from home or different business sites and can build teams of individuals based in many different locations, sometimes continents apart that have never met each other face to face but cooperate thanks to communication technologies. Such teams are known as virtual teams. It is rare to meet the teams that are not virtual at least to some extent (Kirkman & Mathieu, 2005). What is surprising is the fact that there is no agreement among researchers on how to define virtuality nor how to measure it. Because the phenomenon of virtual teams is very promising from both practical and theoretical perspectives, the aims of this article are following: to compare definitions of virtual teams, to check how virtuality was measured in selected empirical studies. Also, to present results of my empirical research on 206 individuals with two different measures of virtuality (distance between team members and a number of face-to-face meetings). In conclusions, virtuality as a feature of any team is presented, and researchers are encouraged to include virtuality dimension in the wider research on the teams.

Keywords: *virtual team, virtuality, virtualness, dispersed teams, team.*

1. Introduction

Virtual teams are prevalent forms of teams in modern organizations, as noted in 2000 by Maznevski and Chudoba, global virtual teams were almost unheard of a decade ago, but today they serve as a critical mechanism for integrating information, making decisions, and implementing actions around the world (Canney, Davison & Ward, 1999, after Maznevski & Chudoba, 2000). Virtual teams are very common in the modern organizations with 66% of multinational firms and 46% of all organizations declaring to use virtual teams (Minton-Eversole, 2012). With growing number of virtual teams in the business world, interest in this topic not only of practitioners but also of the researchers grew. Virtual teams' concept is a highly searched topic with over 500 000 hits on

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Google, 27 000 hits in Google Scholar and 4 000 hits in Web of Science for "virtual team" as of August 2016. Many recent studies whose authors prepared review of extensive literature, have stressed the fact that what is required is a research that will allow to understand the concept of virtuality as well as the more unified measurement and treatment of the construct which in turn would make cross-study comparisons possible (Gilson, Maynard, Young, Vartiainen & Hakonen, 2014).

Therefore, in reply to the suggestions of the cited authors, the aims of this publication are following:

- to compare definitions of virtual teams,
- to learn how virtuality has been measured in the selected empirical studies,
- to present results of my research with two different measures of virtuality.

In order to achieve the goals listed above, I have reviewed extensive literature on the subject as well as conducted my empirical research on 206 individuals to check whether different measures of the team's virtuality indeed mattered when the relationship between identification with the team and team's virtuality was assessed.

Authors try to define the concept of virtuality or virtualness (both terms will be used interchangeably) for over two decades now; many researchers have encouraged other authors to keep track of the previous findings and included them in latest work on the topic. Some of them (see, e.g., Foster, Abbey, Callow, Zu & Wilbon, 2015) have stated that this is not a case so far. In order to meet this expectation, I have aimed at a review of the latest literature on the team's virtuality as well as virtuality's measurement and have noticed a rich body of recent meta-analytical reviews as well as conceptual models summarizing the recent developments in the field (see, e.g., Ortiz de Guinea, Webster & Staples, 2012; Gibson, Huang, Kirkman & Shapiro, 2014; Foster et al., 2015). Consequently, rather than trying to review the findings of the authors from the past few decades of research, I have decided to focus on the critical analysis of the latest meta-analyses of the virtual teams' literature. I have found support for my thesis that all the teams are virtual to some extent and virtuality should be a feature describing all the teams so that research on the team's processes could be enriched with new findings. The selection of the definitions aimed at showing different perspectives in the past 20 years of the research on the topic based on the review of the highly cited and recent articles which describe conceptualization and measurement of virtuality.

2. Virtuality – selected definitions of the concept

Non-withstanding numerous publications, the efforts to establish a clear definition of the virtuality and virtual team have not brought satisfactory results so far. Schweitzer and Duxbury (2010) argued that the term "virtuality" is notoriously ambiguous due to disagreements as to whether electronic communication, geographic dispersion, or other dimensions make a team more virtual. Instead, a universally accepted definition of team's virtuality could have allowed researchers to conduct comparative and cumulative research. A review of the selected definitions of the virtuality starts with how the word "virtual" is being used, points at similarities in the frequently used definitions, presents virtuality as a variable and finally, compares the dimensions of the virtuality. What is worth noting in the beginning is that research on the virtuality in the work context also includes such concepts and research topics as "work at a distance" (Olson & Olson, 2000), "work discontinuities" (Chudoba, Wynn, Lu & Watson-Manheim, 2005), "telecommuting", "working remotely", and "dispersed teams" (O'Leary & Cummings, 2007).

Watson-Manheim, Chudoba, and Crowston (2002) noted that word "virtual" is freely applied in diverse situations and meanings which may lead to two main issues. It makes comparisons of the results of different studies more challenging as well as it increases the risk to overlook earlier research that might be relevant (e.g., research results on the communities of practice, alliances, work districts). Therefore, there is a common agreement on the need to provide a clear understanding of what constitutes "virtual" work environment.

Chudoba et al. (2005) provide some examples of the usage of the word "virtual" depending on the institutional context:

- outsourcing key components of production,
- forming *ad hoc* teams from diverse locations to solve problems,
- working from home, satellite offices or on the road,
- *ad hoc* groups of professionals who team across the Internet around a common topic, e.g., communities of practice which evolved around software development (e.g. Linux).

Watson-Manheim et al. (2002) list cases when term "virtual" is being used to identify diverse emergent work forms different from traditional work concept:

- "virtual worker" could be a contingent or contract employee who is self-employed and has no dominant organizational affiliation but rather temporary relationships with multiple organizations,
- "virtual groups" could consist of inter-organizational relationships when employees of multiple organizations collaborate to develop a product, provide a service, or foster new legislation.

I believe that the word "virtual" as a description of the virtual team has different meanings that the ones listed above which are just evidences of how wide in scope and confusing the concept may be. The investigation of what constitutes a truly virtual team would continue with a review of the common definitions of the "virtuality" of a virtual team that is listed in Table 1.

Table 1. Selected definitions of the team's virtuality and virtual team

Definition	Authors
Virtual teams are forms of organization that allows teams to be composed according to qualifications and expertise without limitations of time, space, and the costs and disruptions of relocation.	Geber (1995), after: Schweitzer & Duxbury (2010)
Groups of geographically and or organizationally dispersed co-workers that are assembled using combination of telecommunications and information technologies to accomplish an organizational task	Townsend, DeMarie & Hendrickson (1998) after: Bell & Kozlowski (2002)
Virtual teams, or groups of individuals who work together from different locations, perform interdependent tasks, share responsibility for outcomes, and rely on technology for much of their communications	Cohen & Gibson (2003)
Physical dispersion of team members is a defining element of virtualness only to the extent that it deters members from meeting face to face, or conversely if proximity encourages members to meet face to face	Fiol & O'Connor (2005)
Either geographic dispersion (i.e. not collocated, not working at the same location); *or* asynchronicity (i.e. members work at different times, either across different time zones or at the same location, but with different work hours/shifts) or both determine virtuality.	Schweitzer & Duxbury (2010)
Distributed teams are complex and multi-dimensional in terms of configuration and distance. Configuration refers to the arrangement of team members across sites while distance relates to aspects of team member separation.	Ocker, Huang, Benbunan-Fich & Hiltz (2011)
We argue that virtuality is the physical or geographic distance between team members when at work, which may be measured in units of distance or time. This conceptualization of virtuality captures the notion that people may have different work hours.	Foster et al., (2015)

Source: Author's own selection as per publications whose authors are listed above.

Definition of virtual team coined by Geber (1995, after: Schweitzer & Duxbury, 2010) points at potential benefits related to a group of highly qualified individuals who can work together overcoming temporal, spatial and budget limitations. In a widely cited work of Bell and Kozlowski (2002), authors define virtual teams as a single, identifiable phenomenon, distinct from proximate teams and referred to the publication of Townsend, DeMarie

and Hendrickson (1998) who stressed two main characteristics of virtual teams: dispersion (both geographic and organizational) as well as usage of technologies in order to work together at common task. Even wider definition was presented by Cohen and Gibson (2003) who claim that four conditions are to be met in order to call a team virtual: authors repeat what previously cited researchers listed (team members should work in different locations and communicate through technologies), but also stress the fact that their tasks should be interdependent and responsibility for the results should be shared among team members.

Fiol and O'Connor (2005) identify physical dispersion with the possibility to meet team members face to face and claim that this is defining the feature of team's virtuality. Schweitzer and Duxbury (2010) after analysis of nineteen definitions of the virtual team observe that there are only two conditions that the teams must meet in order to be called a virtual one: geographic and temporal dispersion or both of them, authors do not mention the reliance on technology as a defining feature of the virtual teams. Ocker et al. (2011) put, even more, attention into the geographic dispersion as instead of using word "virtual," they instead talk about "dispersed" team and highlight the role of configuration as well as separation of team members.

Foster et al. (2015) analyzed 29 unique approaches to conceptualizations of virtuality in order to propose their own definition of virtuality. Authors decided to enrich the research of Hollenbeck, Beersma and Schouten (2012) who stated that instead of creating additional categorizations and taxonomies of the teams (e.g., virtual versus face-to-face), it would be more beneficial for the research community to identify the dimensions that underlie different team types. Based on the review of 42 team types described by other authors, Hollenbeck et al. (2012) identified three core dimensions that can characterize any team: skill differentiation, authority differentiation, and temporal stability. Foster et al. (2015) analyzed additional 27 texts published between 1995 and 2012 in the subfield of virtual team research and came to the conclusion that Hollenbeck's model does not encompass one more dimension that is crucial for virtual teams – distance. Authors stated that distance is the one, most frequently proposed, virtuality dimension which refers to the actual physical distance between team members when working—this distance may be measured in units of distance (e.g., feet or miles) or travel time (e.g., minutes, hours, or days).

As presented above, some researchers have focused on the group context such as geographical and temporal dispersion of the team members (e.g., Schweitzer & Duxbury, 2010), but others understood virtuality as the extent of technological support (e.g., Bell & Kozlowski, 2002). I believe that what is single unique characteristic of the team's virtuality is the distance between

team members, therefore, to me "virtual team" stands for a group of individuals who work together thanks to ICT no matter how far they are located from each other. Consequently, in my understanding we talk about team's virtuality if employees cooperate through communication tools that allow skipping the physical distance between them.

3. Virtuality – a single- or multi-dimensional construct?

Gibson et al. (2014) reviewed all research papers published between 2000 and 2013 and found out that out of 392 papers, 95% included more than one dimension of the virtuality with the majority of the publications defining virtuality as geographic dispersion, electronic dependence, and national or cultural diversity. However, even if the majority of the theoretical papers examining the virtual teams describe the multidimensional concept of virtuality, rarely in the empirical research authors operationalize virtuality using multiple dimensions with almost 90% of papers using one dimension only to operationalize virtuality.

Based on the review of 29 publications on virtuality definitions and dimensions, Foster et al. (2015) observed that only two studies presented virtuality as single dimension concept with Fiol and O'Connor (2005) arguing that virtuality is the extent of face-to-face contact among team members and Saunders and Ahuja (2006, after: Foster et al., 2015) proposing that virtuality is the extent of team member geographic distribution. The majority of authors argued that virtuality is multi-dimensional construct (and identified between two to six dimensions). The most commonly cited dimensions of virtuality were geographic or spatial distance, temporal or time differences, organizational differences, and cultural distance (Foster et al., 2015). I agree with authors that both organizational differences, as well as cultural distance, can also characterize proximate teams whose members meet face to face on a daily basis and as such do not constitute defining feature of virtual team. Foster et al. (2015) critically reviewed also other common dimensions of the virtual teams: use of technology, face-to-face interactions, and extent of multi-team membership. Authors believe that when it comes to the usage of technology-mediated communication or face to face interaction, they may also characterize proximate teams who can use technology to share results of work or organize a face-to-face meeting instead (Hinds & Mortensen, 2005) so should not be considered a distinguishing characteristics of virtuality. I disagree with authors since it is usually the high distance and lack of budget for travels that hinders the possibility of the team to meet face-to-face so as a consequence, for some of the virtual teams, meeting in person would not be an available option. As such, virtual team members would be forced

to communicate electronically. Foster et al. (2015) argue instead that the teams make media choices independently of the physical distance between team members. What the cited authors recommend is that virtuality will be redefined as simply the distance between team members at work (geographic dispersion) and be measured as a continuous variable.

In my view, virtuality is indeed multidimensional concept with key aspects describing team's processes such as the physical distance between team members as well as the extent of face-to-face interactions of the whole team. These two aspects are closely related to each other since limited face-to-face meetings usually occur due to the long distance between teammates as well as high costs of travel (in terms of organizational and personal efforts as well as financial burden for the organizations).

4. Virtuality – a discrete or continuous variable?

Debate whether virtuality is a continuous variable is still open (see e.g., Fiol & O'Connor, 2005) with some authors claiming that virtuality should be seen on a continuum (Bell & Kozlowski, 2002; Cohen & Gibson, 2003; Kirkman, Rosen, Tesluk & Gibson, 2003). Also, others claiming that virtuality should be presented as a dichotomy due to the non-linear differences between the teams whose members never meet face to face and hybrid teams that occasionally meet (Fiol & O'Connor, 2005). According to the authors, differences between the teams whose members never met in person and the teams that are co-located stem from the lack of possibility for informal interactions due to physical dispersion. Researchers mention a few examples of informal information exchange situations that could enrich team members relationships as they occur spontaneously: coffee machine, water dispenser, lunch or parking lot discussions that enhance the bonds between employees and can lead to the creation of more positive work atmosphere, higher trust, and stronger team identification.

The majority of existing studies indeed treat the virtualness as a dichotomy and not a continuum. However in organizational reality, most teams would fall between the two extremes (Griffith, Sawyer & Neale, 2003; Martins, Gilson & Maynard, 2004), with some team members being collocated, others working in different time zones, yet all interacting with each other thanks to ICTs.

Webster and Staples (2006, after: Foster et al., 2015) conducted an extensive review of empirical studies of geographically distributed teams (176 unique datasets) and found virtuality is most often captured as a discrete variable. Only 14 of the 176 studies actually measured virtuality or the distance among team members. Most studies compared co-located with distributed teams and suffered in terms of external validity.

In a meta-analysis of research on virtual teams, Ortiz de Guinea et al. (2012) observed that 63 out of 79 analyzed empirical studies captured virtualness as a discrete measure (comparing co-located and distributed teams usually in laboratory settings) and only 16 studies examined virtuality as a continuous variable.

Interesting are the results of the research on team's functioning that differ depending on the way in which virtualness was treated by the authors. Different results were observed when virtuality was treated as discrete, categorical variable (experiments with student groups or strong manipulations experiments) or continuous variable (in field conditions that allow analyzing longer-term employee teams using survey methodology). In studies with continuous measures of virtualness, the relationship between virtualness and task conflict is more negative (lower conflict for more virtual teams), the relationships with knowledge sharing and satisfaction are more positive, and there is no impact on performance. Ortiz de Guinea et al. (2012) mention that measuring virtualness as a categorical variable instead leads to a simplistic view that does not capture the reality of virtual work in a natural setting. Researchers also question the accuracy of the results of the studies when virtualness was understood as technology use and whose authors would compare distributed teams who used one tool (such as e-mail) with co-located teams that were equipped with no tools (Ortiz de Guinea et al., 2012). The researchers concluded that the present body of research on virtuality cannot be used to draw generalizable conclusions about the relationship between virtuality and its impact on team functioning or outcomes because of the way in which virtuality is operationalized in majority of the studies (as discrete variable).

Building on these conclusions, I am convinced that we can learn more about team's virtuality treated as the universal characteristic of any group of employees if we keep track of virtuality understood as a continuous variable with many teams falling not on the extremes but rather in between the scale that starts with "low virtuality" and ends with "highly virtual team."

5. Virtuality – measurements in selected empirical studies

In order to learn how virtuality has been measured in empirical research, it might be useful to take a closer look at the operationalization of the virtuality index that was prepared by Chudoba et al. (2005) who received answers from 1269 Intel Corporation employees in a web-based survey that aimed at development of the measure of virtuality. This empirical study on the group of real employees (and not e.g., a student group) belongs to one of the unique researches as it operationalizes virtuality as a continuous variable with

18 questions assessing six different dimensions of the virtuality (so called discontinuities which present factors that contribute to a decrease in cohesion among the team). The details of the Virtuality Index are presented in Table 2 below.

Table 2. Virtuality Index with six discontinuities that characterize virtual teams

Type of discontinuity	How it was assessed
Geography	Work at home during normal business days. Work while traveling, for example, at airports or hotels. Collaborate with people in different sites or geographies. Collaborate with people you have never met face-to-face.
Time zone	Work extended days in order to communicate with remote team members. Collaborate with people in different time zones.
Culture	Collaborate with people who speak different native languages or dialects than your own. Collaborate with people from different cultural backgrounds.
Work practices	Work on projects that have changing team members. Work with teams that have different ways to track their work. Work with people that use different collaboration technologies and tools.
Organization	Collaborate with people from different Intel business groups. Work at different Intel sites. Have professional interactions with people outside Intel.
Technology	Work with people via Internet-based conferencing applications. Participate in real-time online discussions, such as chat or instant messaging. Meet with people via video-conferencing tools. Work with mobile devices.

Source: Chudoba et al. (2005).

Authors drawing from the virtual teams' literature have identified six discontinuities that capture distinctive aspects of the virtual teaming environment: geography, time zone, culture, work practices, organization, and technology. Each discontinuity was operationalized with few items that in turn were evaluated based on the frequency of the employee's experience (participants had following options to select from: 'daily', 'weekly', 'monthly', 'quarterly', 'yearly', and 'never'). Geography comes as the first dimension as this is most widely spread defining the feature of virtual teams which were created in order to allow the highly qualified people to work together regardless of their home locations. The next discontinuity is collaboration across multiple time zones which is a consequence of work with people from different geographic locations and may impact the way in which communication between team members takes place (synchronically or

asynchronically) depending on how many overlapping working hours between employees are available (if any), e.g., team members can spontaneously reach each other only for 2 hours if part of the team is located in Singapore and part of the team in Poland (6 hours of difference) assuming standard 8 hours long working day is considered. Third dimension that characterizes virtual team is cultural differences that may result from team members' cultural backgrounds. The cultural discontinuity according to authors plays an important role in virtual teams as communication is mediated through ICT and clearly, is linked to the other dimensions such as geography and time. Further discontinuity is work practices that encompass team members' different perspectives about how work should be done as well as differences in ICTs; common work practices would allow the team to work smoothly together. The fifth source of discontinuity is the organization which refers to employees being members of different organizations (interorganizational discontinuity) or different functional or business units (intra-organizational discontinuity) which may lead to the presence of dissimilar interests or priorities (e.g., local vs. global) among team members. The last discontinuity is technology that plays a crucial role in virtual team functioning that would not be possible without Information & Communication Technologies (ICT). Chudoba et al. (2005) asked participants about their experience with less common media such as conferencing application, instant messaging, or video-conferences.

As a result of the statistical analysis, authors observed only three discontinuities and eliminated four items from the original index due to redundancy, so that the final tool encompasses following dimensions of virtuality: team distribution (over different geographies and time zones, relying on basic collaboration technologies), workplace mobility (work in environments other than regular offices including different business sites, home, and travel routes) as well as the variety of practices (the degree to which employees experience cultural and work process diversity). What should be highlighted is the way in which the empirical study has been prepared and conducted which builds on the previous research body but at the same time aims at the creation of universally applicable new tool. A critical review of the six discontinuities originally identified by the authors would suggest that as much as geographical, temporal and technological are unique to the "virtual teams", other dimensions such as culture, organization, and work practice could also characterize proximate teams. It is interesting to learn that indeed only three discontinuities were identified in the group of Intel employees and it would be beneficial to learn how the tool was applied in different organizations.

Schweitzer and Duxbury (2010) instead in order to operationalize the dimensions of virtuality firstly ran a thorough analysis of the literature and identified four common dimensions of virtuality. Secondly, they have

conducted an empirical study of 107 team members of 30 virtual teams of Canadian technology sector company and applied three different dimensions of the virtuality. Table 3 below captures the dimensions of virtuality as well as the way in which virtuality was measured.

Table 3. The measurement of virtuality dimensions

Dimension	Operationalization
Proportion of team work time spent working virtually (WV)	1The number of weekly hours spent on work activities related to the particular VT. The number of weekly hours spent working *virtually* (i.e. not face-to-face) on work activities related to the VT.
Proportion of member virtuality (MV)	The total number of different member locations divided by the number of team members and multiplied by 100.
Degree of separation [distance virtuality (DV)]	The distance team members must travel in order to meet, allowing for the number of collocated team members, the number of locations and the distance between those locations

Source: Schweitzer and Duxbury (2010).

The first dimension illustrates the proportion of time that the virtual team members spent on the team's activities working apart, not face-to-face (neither through meetings or the collocation of some of the members). The second dimension is the proportion of member virtuality which shows what is the split between team members who work in different locations, e.g., a team that is 100% dispersed would have no two members working in the same location. The third dimension is the geographic distance between team members (e.g., the spatial distance between members, or the amount of effort or travel time necessary to meet as a team). Authors operationalized it as the distance that team members must travel to meet, e.g., employees collocated in the same city can have inexpensive, impromptu meetings whereas employees that are very far away from each other in terms of the distance in kilometers or hours spent in the airplane would require much more time and money to meet face-to-face. Statistical analysis of the results showed that even if the items are theoretically related, they do not measure the same construct (see also O'Leary & Cummings, 2007; Gibson & Gibbs, 2006 for similar conclusions on differing dimensions).

6. Virtuality – measurement in my own study

As described in meta-analytical studies, a rich tradition of different ways in which team's virtuality has been measured in empirical research exists (Carte, Chidambaram & Becker, 2006; Gibson & Gibbs, 2006; Zigurs, 2003). Also, identification with the team belongs to the common research topics

(Huettermann, Doering & Boerner, 2014) as it is considered a team's adhesive having an impact on the external and internal teamwork results. Identification understood as the emotional importance that team members assign to the fact that they are part of a given group (van der Vegt & Bunderson, 2005) plays an important role supporting cooperative team processes as well as reducing the dysfunctional team processes. I have assumed that the team's virtuality would matter in terms of team member's identification with the group: the less virtual the team, the stronger the identification due to the personal contact (face to face meetings and team member's proximity) and run empirical research in order to verify this hypothesis.

Considering that there are many different approaches to the team's virtuality related to the empirical research as well as theoretical recommendations. I have decided to include two simple and universally applicable measures of the team's virtuality in the empirical study: one related to the spatial distribution of the team members and the other one related to the actual number of face-to-face meetings of the whole team. The study was conducted on the group of 206 individuals (116 women and 90 men) who were asked to complete an online questionnaire with questions about various aspects of their current job; the survey was eligible only for people who work in a team, and as such e.g., freelancers' answers would not be considered. The invitations to participate in the study by completing a questionnaire were shared on social networking website, online portals for graduates of the university of economics as well as through emails sent by the author. All of the people who joined the study work in a team and thus could describe their experience as a team member. 84% of the participants were between 17 and 37 years old and majority of them were of Polish origins (77%).

Earlier research has shown that indeed the place of work or employee location rather than the real distance between the employees affects the perceived distance among the team members (O'Leary & Mortensen, 2010). So no matter if the team members are only a few kilometers far from each other but work in a different office, it may have the same effect on the team functioning as if they would be hundreds or thousands of kilometers apart if they do not share the working space. What is important from this perspective and may have impact on the team identity and building trust is the possibility of spontaneous meetings, water-dispenser or coffee machine chats that are allowed only for the collocated team members and are hardly substituted for by the informal chats or videoconferences. This dimension of the virtuality has been measured by the question: *How would you describe most of your team members' location having as a point of reference your place of work: same room/ same building/ different building in the same city/ different city/ different country* (modified version of the measurement used by O'Leary &

Cummings, 2007). From the frequency analysis, it seems that majority of the participants work within small physical distance from their teammates with around 75% of people indicating that they either work in the same room or the same building as most of their team members.

The second measurement of the virtuality employed in the study consists of a number of face-to-face meetings of the entire team since the research results so far have indicated that the frequent direct interactions between team members reduce the perceived distance between employees (Muethel, Gehrlein & Hoegl, 2012). The measurement used was based on the tool tested in the empirical study conducted by Kirkman et al. (2003) and allowed for quantitative analysis with one question only: *How many times did your entire team meet face-to-face in the past year?* There were no options to be selected as answers to this question, so e.g., for people who answered "every day" the number of meetings was coded as 365. Based on the average number of the face-to-face meetings of the entire team (95 per year), we can state that participants work in teams that are virtual only to some extent considering that the F2F meetings are rather frequent. Table 4 presents the number of face-to-face meetings depending on the location of employees.

Table 4. Number of face-to-face meetings of the entire team depending on the team members' location

Location	Number of participants	Average number of F2F meetings
Same room	82	137.78
Same building	73	96.19
Same city	12	67.00
Different city	21	15.71
Different country	18	4.33
Total	206	94.82

In order to learn how the virtuality's operationalizaton matters, I have compared the relationship between team's virtuality and identification with the team. Indeed, results differ depending on the way in which virtuality is captured in my study: there are no statistically significant links between virtuality and identification when virtuality is measured as a distance between team members (virtuality understood as physical dispersion of the team) but correlations are statistically significant when virtuality is measured as a number of face-to-face meetings (virtuality reversely coded: the higher the number of the direct interactions of the whole team, the lower the virtuality). It occurred that in the latter case, the more face-to-face meetings took place, the stronger the team member's identification with the team. This result translates into a negative link between team's virtuality and identification with the group: the more virtual the team is, to the lesser extent team members would identify

with the group. What is interesting is that the relationship between virtuality (understood as number of face-to-face meetings) and social identification mattered only for women. When participants' sex was considered for detailed analysis, it occurred that the positive significant relationship between number of face-to-face meetings and identification exists only in the group of women and is insignificant for men. Clearly, female team members would identify more strongly with the team, depending on the frequency of the direct interactions with team members.

Table 5. Relationship between number of face-to-face meetings and social identification

	Social identification (all)	**Social identification (women)**	**Social identification (men)**
Number of F2F meeting	0.226(**)	0.283(**)	0.157
Number	206	116	90

** Rho Spearman is significant at 0,01.

7. Discussion of the results

We can observe disconnection between theory and practice in the research on the virtuality. On one hand, the extensive body of theoretical studies presents virtuality as a continuous variable with multiple dimensions and encourages researchers to study the phenomenon of the virtual teams in their natural settings. On the other hand, researchers who conduct the empirical studies tend to present virtuality as a discrete variable (comparing virtual teams with proximate teams) and operationalize virtuality with one dimension only with heavy reliance on student projects and laboratory studies (Martins et al., 2004; Schweitzer & Duxbury, 2010). The discrepancy between what is recommended and what is actually done could stem from the practical challenges that researchers experience with the access to the real teams, budgets required for long-term studies in the organizations and difficulties to apply theoretical recommendations (e.g., such as very detailed instructions on how to assess the geographical distance between team members) in practice while keeping the research process efficient and easily replicable.

Considering the previous arguments on how much the way in which virtuality is operationalized matters and at the same time learning that only in limited empirical studies different operationalizations of the virtuality were implemented, I have decided to compare two different measurements of the virtuality. Both of them were very simple (consisted of one item) but captured virtuality in a dissimilar manner (either as the physical distance or number of

the face-to-face interactions between team members). What is worth stressing is the fact that the measurements used in my study could be used by many different organizations as they did not require any additional calculations from the author and assumed that the participant of the study who is a team member would be the best source of information about the team's virtuality. Furthermore, considering that the tools are universally applicable, it allows the researchers to use them in different contexts and thus makes comparisons across various groups possible which enriches the research and creates bridges between studies (as opposite to the gaps caused by the tools that are too much customized to the needs of the given study and as such are limited to one research only). What should be stated as a limitation of my empirical study are statistical proprieties of the different ways of operationalizations (with virtuality as the location being categorical variable and virtuality as some meetings being continuous variable) as well as a relatively small sample of participants that may have an impact on the results. Yet, the findings from my empirical research seem to be consistent with the literature – the method to measure the variable used in the study mattered as for the relationship between virtuality and identification with the group.

McGrath's definition of a team – "an entity that interacts, is interdependent, mutually aware, with the past and an anticipated future" (McGrath, 1984, p. 6, after: Griffith & Neale, 2001) at no point mentions that face team members should stay within a closer physical distance from each other or should have face-to-face contact in order to be called a team. McGrath stressed the fact of team members' interactions with each other and worked on the common goal which is a real defining feature of any team. Considering the developments of the technology in the recent few decades that allow people to cooperate across the distance; there is a purpose to talk about the new phenomenon. But, maybe instead of calling it virtual teams, we could discuss the virtuality of the modern teams.

Treating virtuality as a variable that can describe the context of each and every team can enrich research on team processes in terms of the team effectiveness models. Contextual factors impact team outcomes via direct, mediating, and/or moderating effects. Virtuality seen in a similar manner as team characteristics (for instance team size or teamwork skills) and organizational or environmental factors (e.g., trainings, rewards) in the description of the team processes can allow us to more fully understand and assess teams (Foster et al., 2015). Griffith and Neale (2001) came to similar conclusion suggesting that virtualness is just one of many characteristic features of a team and not the defining dimension of the "virtual team" so it should be considered in a similar way as, e.g., conflict management or diversity that affects team performance. Consequently, what I recommend instead of comparing two

(virtual and proximate) or three (virtual, proximate, and hybrid) categories of teams is to see virtuality (understood as reliance on the Information and Communication Technology that allows skipping the geographical and temporal distance between team members) as a continuous variable that can describe any team. I believe that the challenges with defining the virtuality or stating what are the differences between virtual and non-virtual teams are evidences that the virtual teams' field is not necessarily immature but it might be erroneous to talk about the virtual teams per se. Much of existing literature on virtual teams is indeed anecdotal and descriptive with much attention being given to the Anecdotal description of the characteristics, costs, benefits, and challenges of virtual teams have dominated the scientific discourse for the past few decades (Martins et al., 2004; Gibson & Gibbs, 2006). Instead, it might be more efficient to see virtuality as a dimension of any team that will allow to develop new theories, cumulate the knowledge on the team context and apply it to team research (Foster et al., 2015). Therefore, I encourage the future research to use simple, universally applicable tools to measure the virtuality of the teams that would enrich wider literature on the team functioning and reduce the need to decipher level of details and definitions split that is currently hindering the scientific debate. Adding virtuality to the contextual variables when conducting team research could help further theory development and integration of the research on both virtual teams and teams which allow for aggregation of results across studies and generation of cumulative knowledge in the subfield of virtual team studies.

8. Conclusions

Organizations in the recent decades have implemented more changes related to the structure than in the past centuries as result of the advanced technology changes. As much as organizations are changing; so do employees and their work conditions. Two decades ago, working at a distance might have been a rare option for organizations and employees, yet currently "virtual work" belongs to rather common work arrangements (Herbsleb, 2007) Therefore, it might be beneficial not to ask whether a team is virtual but "how virtual is the team?" (Schweitzer & Duxbury, 2010, p. 275).

When it comes to the three aims of the article: to compare definitions of virtual teams, to learn how virtuality has been measured in the empirical studies, and to present results of my own research with two different measures of virtuality, I have come to the following conclusions. Firstly, majority of authors would define the team's virtuality as the distance (both geographic and temporal) between team members, but other would add reliance on the technology (that allows replacing the face-to-face contact) among team

members. I assume that it is primarily thanks to the developments of the ICTs that virtual teams are created and allow team members to skip the distance and replace face-to-face interactions. Secondly, based on the results of the meta-analytical studies, it was observed in theoretical research that although the virtuality was mainly presented as continuous and multi-dimensional variable, in majority of the empirical research, the virtuality was measured as a dichotomy and single dimension only. I have selected empirical studies (Chudoba et al., 2005; Schweitzer & Duxbury, 2010) whose authors did follow the theoretical recommendations and measured team's virtuality on the few different dimensions. Thirdly, in my own empirical study, I have operationalized virtuality as both the distance among team members (categorical variable) and the number of face-to-face meetings (continuous variable). Different measurements lead to different results with a significant relationship between the team member's identification with the team and virtuality only when a number of face-to-face meetings were considered: the stronger the identification with a group among female participants, the more frequently the whole team meets face-to-face.

In summary, I am convinced that it is reasonable to talk about the virtuality or dispersion of the team as a characteristic feature of any team. Also, a feature that can be displayed on the continuum, ranging from the teams whose members are all collocated and meet face to face regularly (not at all virtual/ not dispersed team) to the teams whose members all work in different locations and who have never meet in person (purely virtual team).

References

Bell, B.S., & Kozlowski, S. (2002). A typology of virtual teams: Implications for effective leadership. *Group Organizational Management, 27*(1), 14-50.

Carte, T.A., Chidambaram, L., & Becker, A. (2006). Emergent Leadership in Self-Managed Virtual Teams: A Longitudinal Study of Concentrated and Shared Leadership Behaviors. *Group Decision and Negotiation,15*(4*),* 323-343.

Chudoba, K.M., Wynn, E., Lu, M., & Watson-Manheim, M.B. (2005). How virtual are we? Measuring virtuality and understanding its impact in a global organization. *Information Systems Journal, 15,* 279-306.

Cohen, S.G., & Gibson, C.B. (2003). In the beginning: Introduction and framework. In S.G. Cohen & C.B. Gibson (Eds.), *Virtual teams that work: Creating conditions for virtual team effectiveness* (pp. 1-13). San Francisco: Jossey-Bass.

Fiol, C.M., & O'Connor, E.J. (2005). Identification in face-to-face, hybrid, and pure virtual teams: Untangling the contradictions. *Organization Science16*(1), 19-32.

Foster, M.K., Abbey, A., Callow, M.A., Zu, X., & Wilbon, A.D. (2015). Rethinking virtuality and its impact on teams, *Small Group Research, 46*(3), 267–299.

Gibson C.B., Huang, L., Kirkman, B.L., & Shapiro, D.L. (2014). Where global and virtual meet: The value of examining the intersection of these elements in twenty-first-century teams. *Annual Review of Organizational Psychology and Organizational Behavior, 1*(1), 217-244.

Gibson, C.B., & Gibbs, J.L. (2006). Unpacking the concept of virtuality: The effects of geographic dispersion, electronic dependence, dynamic structure, and national diversity on team innovation. *Administrative Science Quarterly, 51,* 451-495.

Gilson, L.L., Maynard, M.T., Young, N.C.J., Vartiainen, M., & Hakonen, M. (2014). Virtual Teams Research 10 Years, 10 Themes, and 10 Opportunities. *Journal of Management, 41,* 1313–1337.

Griffith, T.L., & Neale, M.A. (2001). Information processing in traditional, hybrid, and virtual teams: from nascent knowledge to transactive memory. *Research in Organizational Behaviour, 23*, 379-421.

Griffith, T.L., Sawyer, J.E., & Neale, M.A. (2003). Virtualness and knowledge in teams: Managing the love triangle of organizations, individuals, and information technology. *MIS Quarterly 27*(2), 265–287.

Herbsleb, J. D. (2007). Global software engineering: The future of socio-technical coordination. In: Proceeding FOSE '07 2007 Future of Software Engineering (pp. 188-198). Washington: IEEE Computer Society Washington.

Hinds, P. J., & Mortensen, M. (2005). Understanding conflict in geographically distributed teams: The moderating effects of shared identity, shared context, and spontaneous communication. *Organization Science, 16,* 290-307.

Hoegl, M., & Muethel, M. (2016). Enabling Shared Leadership in Virtual Project Teams: A Practitioners' Guide. *Project Management Journal, 47*(1), 7-12.

Hollenbeck, J.R., Beersma, B., & Schouten, M.E. (2012). Beyond team types and taxonomies: A dimensional scaling conceptualization for team description. *Academy of Management Review, 37*, 82-106.

Huettermann, H., Doering, S., & Boerner, S. (2014). Leadership and team identification: Exploring the followers' perspective. *The Leadership Quarterly*, *25*(3), 413-432.

Joy-Matthews, J., & Gladstone, B. (1999). Extending the group: A strategy for virtual team formation. *Industrial and Commercial Training 39*(1), 24-29.

Kirkman, B. L., & Mathieu, J. E. (2005). The dimensions and antecedents of team virtuality. *Journal of Management, 31,* 700-718.

Kirkman, B.L., Rosen, B., Tesluk, P.E., & Gibson, C.B. (2003). The impact of team empowerment on virtual team performance: the moderating role of face-to-face interaction. *Academy of Management Journal, 47*(2), 175-192.

Martins, L.L., Gilson, L.L., & Maynard, M.T. (2004). Virtual teams. What do we know and where do we go from here. *Journal of Management, 30*(6), 805-835.

Maznevski, M.L., & Chudoba, K.M. (2000). Bridging space over time: global virtual team dynamics and effectiveness. *Organization Science, 11,* 473-92.

Minton-Eversole, T. (2012, 19 July). Virtual teams used most by global organizations, survey says. Retrieved from https://www.shrm.org/resourcesandtools/hr-topics/organizational-and-employee-development/pages/virtualteamsusedmostbyglobalorganizations,surveysays.aspx.

Muethel, M., Gehrlein, S., & Hoegl, M. (2012). Socio-demographic factors and shared lea- dership behaviors in dispersed teams: Implications for human resource management. *Human Resource Management, 51*(4), 525–548.

O'Leary, M.B., & Cummings, J.N. (2007). The spatial, temporal, and configurational characteristics of geographic dispersion. *MIS Quarterly, 31,* 433-452.

O'Leary, M.B., & Mortensen, M. (2010). Go (Con)figure: Subgroups, imbalance, and isolates in geographically dispersed teams. *Organizational Science, 21*(1), 115-31.

Ocker, R.J., Huang, H.Y., Benbunan-Fich, R., & Hiltz, S.R. (2011). Leadership dynamics in partially distributed teams: An exploratory study of the effects of configuration and distance. *Group Decision and Negotiation, 20*(3), 273-292.

Olson, G.M., & Olson, J.S. (2000). Distance matters. *Human-Computer Interaction, 15,* 139–178.

Ortiz de Guinea, A., Webster, J., & Staples, D.S. (2012). A meta-analysis of the consequences of virtualness on team functioning. *Information & Management 49*(6), 301-308.

Schweitzer, L., & Duxbury, L. (2010). Conceptualizing and measuring the virtuality of teams. *Information Systems Journal*, *20*, 267-295.

Van der Vegt, G.S., & Bunderson, J.S. (2005). Learning and performance in multidisciplinary teams: The importance of collective team identification. *Academy of Management Journal*, *48*, 532-547.

Watson-Manheim, M. B., Chudoba, K. M., & Crowston, K. (2002). Discontinuities and continuities: A new way to understand virtual work. *Information Technology &* People, *15*, 191-209.

Zigurs, I. (2003). Leadership in virtual teams: Oxymoron or opportunity? *Organizational Dynamics, 31*(4), 339-351.

Biographical note

Magda Ferretti received her Ph.D. from Warsaw School of Economics where she had defended her Ph.D. thesis on Applicability of the shared leadership in virtual teams. She also holds an MA in Organizational Psychology from the University of Warsaw and an MA in International Business from Warsaw School of Economics. Her current research interests include shared leadership, management of virtual teams, and corporate social responsibility. She works in the international bank and gains first-hand virtual work experience as a manager in the global client relationship team.

COMPARATIVE ANALYSIS OF INSTRUMENTS USED TO MODIFY TEMPLATES IN CONTENT MANAGEMENT SYSTEMS

***Wojciech Wójtowicz*[1]**

Abstract
Contemporary websites become the primary, and often the only communication tool for the majority of enterprises and organizations. However, they require frequent updating of content. In such cases, content management systems (CMSes) become a dedicated solution. Due to the large offer of commercial and non-commercial CMS solutions, making the right decision is strictly connected with the costs generated by the said systems. Templates, which define the layout of a website, are a crucial element of every content management system. The following paper attempts to answer the questions whether templates can be modified by using the publicly available tools without the necessity to involve IT specialists and, consequently, incurring additional costs of making such changes.
Keywords: *Content Management System, templates, Cascading Style Sheets, websites.*

1. Introduction

Content management systems are a very frequently used tool to build contemporary websites (Figure 1). They have been functioning on the Internet technologies market since mid-nineties. They are based on the PRISM (*Presentation of Realtime Interactive Service Material*) system of the American company CNET, in which a website template with the content read dynamically directly from a relational database was used for the first time (Wieczorkowski, 2015). The dynamic development of content management systems occurred at the beginning of the 21st century.

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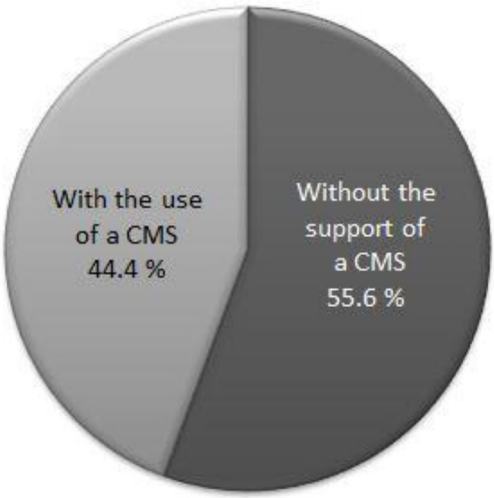

Figure 1. The use of content management systems (CMSes) to build websites
Source: Q-Success Software Quality Management Consulting on W3Techs – Web Technology Surveys websites (https://w3techs.com).

The main advantage of content management systems is the possibility to edit the content easily without having specialist knowledge of Information and Communication Technologies. It is enabled by the construction of the content management system, in which the content of a website has been separated from its layout. New information constituting the website's content entered by authorized users reaches the database. Each indication of a website address by the clients using a browser results in the CMS generating the relevant website on the basis of the content stored in the database and the template defining the website's layout. This enables a relatively quick and very flexible management of the content of the information published on the Internet. Whereas the content editing is performed with the use of simple tools included in the user interface of a content management system. Modern CMSes allow for the modification of not only the document's content but also its structure (Nalepa, Ligęza & Wójcik, 2007; Zakrzewski & Stroińska, 2009; Matysek & Tomaszczyk, 2009).

The aim of this paper is to analyze the possibility to change the graphic templates of content management systems beyond the modification frames of graphic elements provided for in the said systems. The analysis mentioned above will discuss only the methods which do not generate additional costs for the users of a content management system.

2. Content management systems (CMSes)

CMSes are most frequently built on the basis of a platform comprising a web server with an embedded PHP module and a MySQL or PostgreSQL database server, i.e. open source systems operating under the GNU General Public License (Prauzner, 2015). ASP.NET and JAVA technologies are much less frequently used in this case, while Microsoft SQL and ORACLE are not very common in the case of database servers.

The offer of content management systems is very broad and comprises several hundred systems, not including dedicated systems, i.e. developed for certain entities. A large proportion of publicly available CMSes is free. Those systems constitute at the same time a group of the most frequently used content management systems. The ones we can distinguish are WordPress, Joomla! and Drupal. The said systems constitute in total over 60% (Figure 2), and with respect to the statistics including Polish websites – over 80% (Figure 3) of the most frequently used CMSes (according to the data published by Q-Success Software Quality Management Consulting on W3Techs – Web Technology Surveys websites and the ICT BuiltWith® Pty Ltd forecasts and technology trends website).

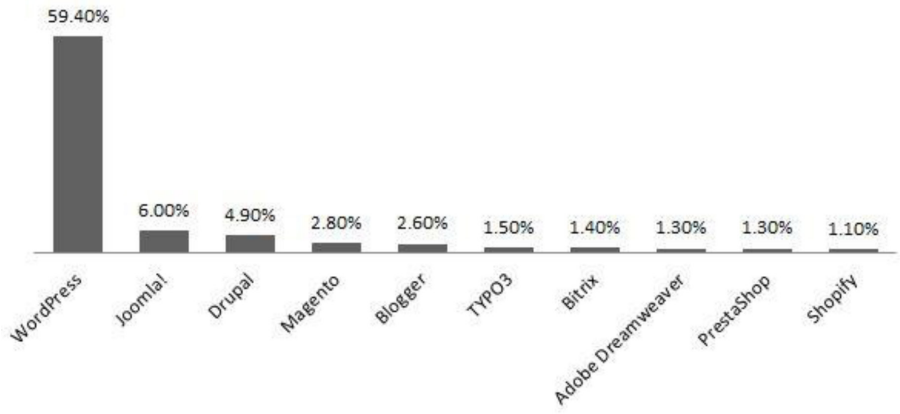

Figure 2. The statistics concerning the use of content management systems in building websites worldwide

Source: Q-Success Software Quality Management Consulting on W3Techs – Web Technology Surveys websites (https://w3techs.com).

The WordPress system operating since 2003, based on PHP and MySQL technologies and distributed under the GNU license (http://www.gnu.org) is an absolute leader in this case. It is also a very dynamically developed system.

Since 2003, several dozen versions of this systems have been created. The latest version – 4.5.2 – was released in May 2016 (https://wordpress.org).

A slightly less popular system – Joomla! – is based on the same technologies (PHP and MySQL) and, similarly to WordPress, is an open source system. Since its first launch in 2006, a dozen or so versions of this system have been created. The latest version – 3.5.1 – is the first in the 3.5.x versions series, released for the first time in March 2016 (https://www.joomla.org).

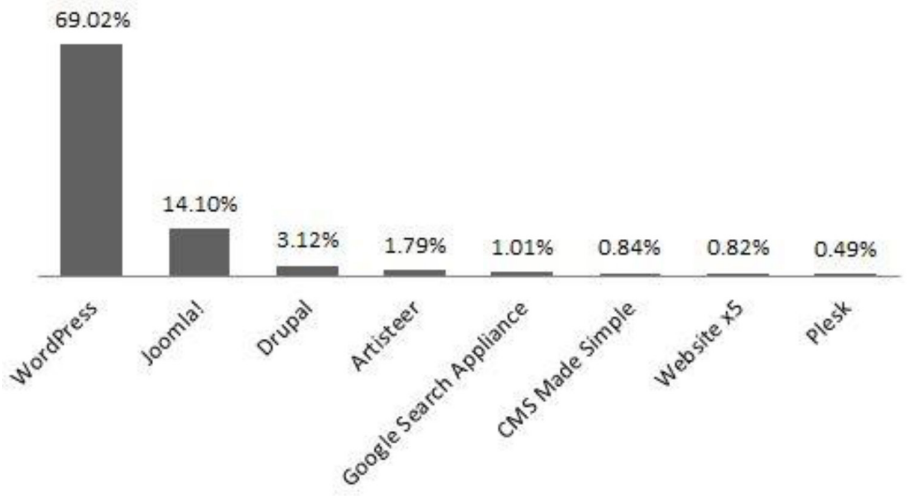

Figure 3. The statistics of the use of content management systems in building websites in Poland

Source: On the basis of the data of the ICT BuiltWith® Pty Ltd forecasts and technology trends website (http://trends.builtwith.com/cms/country/Poland).

The third most frequently used system is Drupal. Like previously mentioned systems, this one was also created in PHP. However, it can support different database servers, starting from MySQL, through PostgreSQL and SQLLittle, ending with Microsoft SQL. This system is developed as dynamically as WordPress. It appeared on the market in 2001 and since then several dozens of versions of this system have been created. Its latest version is 8.1.2, which was released on 1 June 2016 (https://www.drupal.org).

3. Graphic templates

The use of a model dynamically combining the content collected in the database with the template defining its layout enables not only a flexible exchange

of the website's content through its easy editing but also has an additional advantage of an equally easy mechanism of exchanging the website's layout through the use of a new template.

The templates, usually prepared by graphic designers specializing in building layouts for websites, are coded in the form of relevant rules of Cascading Style Sheets (CSS). They define the properties of individual elements forming a website's template.

Modern templates define not only the properties related to the appearance of individual markers but also the correlations between them and their allocations in the area of presentation of the website's content. A large number of elements forming the template, cascading correlation between individual definitions similar to the inheritance mechanism used in object-oriented programming and division in which individual elements are distributed, make the simple definitions of CSS's properties create an often complex structure, very difficult to interpret without specialized tools.

Therefore, the change of a website's layout requires an appropriately prepared template. The user of a content management system may use for this purpose ready-made templates shared by the authors of individual CMSes. Websites sharing free and commercial templates for individual content management systems are also available. Examples of such websites are among others: www.subrion.org, www.freecmstemplates.com, www.template.net, and themes.cmsmadesimple.org.

It is also possible to commission the creation of a dedicated template for the built website. Such a solution guarantees that the template will meet our expectations and will not require further modifications. This, however, entails some costs we have to bear.

All options mentioned above lead to the use of a ready-made template. If we focus on the lowest costs of obtaining a template and use one of the free distributions, we have to take into account the fact that it may be difficult to find a template that meets all of our expectations. We also have to be aware that the pool of free templates is publicly available, which means that the layout of our website will not be unique and, consequently, it may not be easy to achieve one of the marketing objectives, i.e. to distinguish oneself from the competition (Wit, 2009).

So how to obtain a template that is unique and adjusted to all our needs while keeping the costs to a minimum? A good solution would be to modify a free template so that it meets our needs. Yet any interference with the code of CSS files that store the properties of individual website elements without specialized tools may not be easy and frequently entails the necessity to involve a qualified specialist to make such a modification, which results in the increase of the related costs.

It also turns out that modern browsers have an embedded tool that significantly facilitates the modification of a template and allows for making potential changes with a minimum knowledge of the CSS technology.

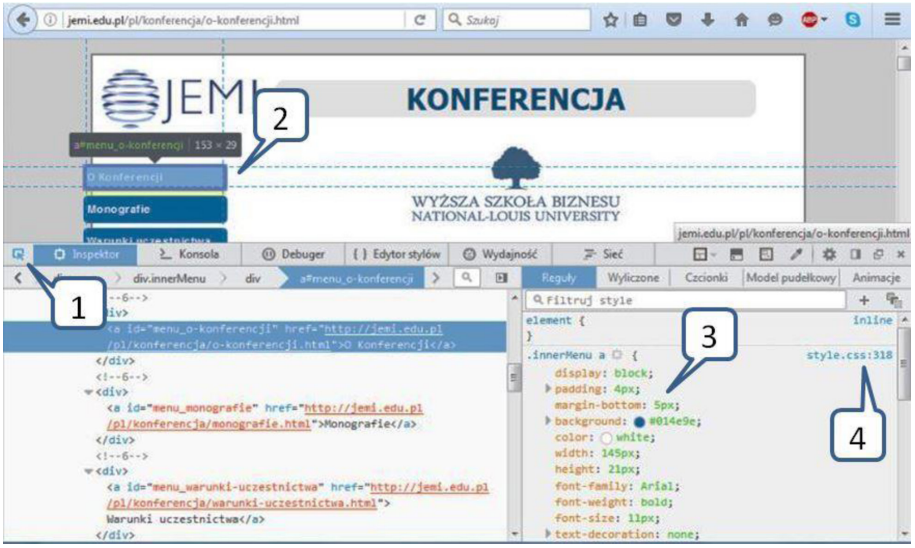

Figure 4. The work area of Firefox browser with enabled Developer Tools. 1) starting the elements indication mode, 2) the indicated element, 3) CSS definitions describing the properties of the indicated element, 4) location of the properties in CSS files

Below we will analyze the procedures for changing a website's layout through the modification of the template, with a particular focus on the maximum reduction of costs, i.e. with the use of publicly available and free tools.

4. Modification of templates in Joomla!

Although this system is not the leading content management system in terms of frequency of use, it has the most user-friendly interface which can be used in order to modify graphic templates.

In the default installation of the latest 3.5.1 version of Joomla!, we get four templates. The system administrator interface enables a simple modification of several parameters of each of the templates installed by default. The changes include the possibility to add a logo of an institution or a company to the template, select one of the several available color schemes, and a very

simple modification of the font of the text the website will use. These minor modifications allow for a slight diversification of the available templates. However, they cannot be considered sufficient, in particular in terms of distinguishing the website from the competition.

As an administrator, we can simultaneously edit all files, including CSS format files that store complete information about the layout of the template installed in the system. We can move to the editing mode by selecting the chosen template. It shows among others a list of all files comprising the template. In the case of templates prepared for Joomla!, CSS files are located in a catalog of the same name, which facilitates their location. When we open it, we get the possibility to edit each of them in a very convenient editor which highlights the syntax.

Unfortunately, in most cases, CSS files constitute a very complex set of definitions of the properties of individual elements. Their modification in the editor without adequate qualifications or an appropriate tool facilitating such modification is very difficult.

Aid is provided by modern browsers, and more specifically the embedded programming tools called Developer Tools. They are used by all of the most common browsers, both Microsoft's Internet Explorer (from version 11) and the new Edge browser, Mozilla's browser – Firefox (from version 11), Google's browser – Chrome, and Safari browser dedicated to devices with Apple's IOS system. In the latter one, this tool is called Web Inspector. It is available from versions iOS 6.1, and its activation requires an additional selection of the appropriate option in the menu. The Web Inspector is activated through the menu or shortcut key Ctr+Alt+I. Unlike in the case of other browsers, where Developer Tools are enabled by selecting the F12 function key.

In the case of website templates, this tool is perfect for locating the relevant definition in complex CSS files through the indication of the selected element of the website with the mouse cursor. In response, we get the definition of cascading style sheets for a given element with the precise location of the definition (name of the file and number of the line). Having this information, we are easily able to make individual changes in the relevant file that define the properties of a given element.

The template modification procedure with the use of Developer Tools is therefore performed according to the following diagram (Figure 5).

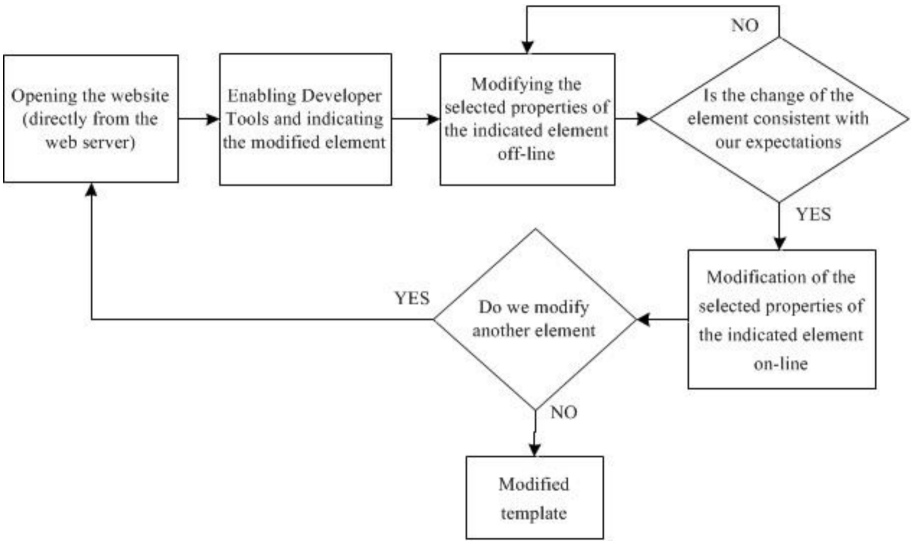

Figure 5. The template modification diagram with the use of Developer Tools embedded in the browser

In the first step, we open our website with the use of a chosen browser by indicating the domain name specifying the location of our website. As a result of such an inquiry, the content management system operating on the server generates a website created from the combination of the content located on the database server and the template specifying the layout of our website. In the next step, we enable the Developer Tools embedded in our browser by using the appropriate function key or by selecting them in the browser's menu.

Selecting the option of the Developer Tools' selector allows for indicating the element of the website we want to modify. The indication of the selected element while switching from Developer Tools tabs to CSS files editing results in the indication of the rules specifying the properties of the given element. In the opened editor window of CSS files, we can change a given value and therefore change the layout of the given element. In almost every browser the embedded programming tools will also show the possible values of a given property, which significantly facilitates the modification for users who do not have good knowledge of the CSS cascading style sheets technology (Figure 4).

However, it is necessary to bear in mind that the modifications made in this manner are modifications in the off-line mode, i.e. they function only on the website loaded locally to the browser. A permanent change of the selected properties requires saving the changes on the server in the appropriate place

in the relevant CSS file. This is also facilitated by Developer Tools, in which we obtain precise information on the location of the changes, consisting in the indication of the name of the CSS file and the number of the line in which the change is to be made.

Making a permanent change directly in the files located on the server is possible in the case of Joomla! by editing the file indicated in Developer Tools from the system administrator level. By moving to the option of template management and indicating its name, we get the possibility to edit each of the files forming the template, including the CSS file indicated by the browser's programming tool. We modify the file directly on the web server by saving the changes made in the editor.

An alternative for editing the file from the system administrator level of a content management system is the possibility to establish a connection through the File Transfer Protocol client, download the modified CSS file to local resources, and modify it with the use of any editor in accordance with the indications from Developer Tools. We overwrite the locally modified file version on the server using the established FTP session.

Considering the fact that all the data necessary to make the changes are provided by Developer Tools, the modification of the properties of individual elements of the template should not cause problems for an average user of a content management system; especially assuming that we only make a reconstruction of the installed template.

In this case, particular attention should be paid to the copyright of the template's authors, and especially the clauses allowing for the modification of the downloaded templates.

5. Modification of templates in WordPress

In WordPress content management system, at the start the user gets only two graphic templates. The scope of modification of the templates from the administrator's level in the default installation is significantly broader than in Joomla! content management system. The user gets the possibility to select one out of four color schemes for all template elements, and also the possibility of an individual change of the colors of selected template elements. He can also easily add a logo or a website background. Although the administrator's interface of the WordPress system allows for a slightly broader modification of the template, it does not guarantee the development of a unique layout of the website. The mentioned changes are limited only to some template elements.

As in the case of Joomla!, here the possibilities of template modification can also be significantly extended by supporting the process of changes with the browser's Developer Tools. Here the pattern is very similar to the changes

made in the templates of the Joomla! system. (Figure 5). Also, the modification of CSS files alone is possible directly from the administrator's interface with the use of the available editor. However, in this case, we encounter a less user-friendly editor environment. The syntax is not highlighted, and the lines of the edited file are not numbered. This greatly hinders the modification of the properties of the selected elements. Despite precise information about the location of the definition of the selected element's property we get from Developer Tools, we are not able to find the right definition as quickly and precisely as in Joomla!. In the case of WordPress, the stage of updating the CSS files located on the server may be performed with the use of the FTP client. The default location for cascading style sheets of the templates in WordPress is the wp-content/themes/ catalog. We can edit the file downloaded through the FTP in the editor which highlights the syntax and, more importantly, numbers the subsequent lines of the edited text. This can be done with the use of the very popular and free editor Notepad++. We place the modified file on a server, saving its original location.

We can eliminate the inconvenience resulting from the relatively limited editor embedded in the administrator's interface of the WordPress system by installing an add-on that facilitates file editing. Examples of such add-ons are "WP Live CSS Editor" and "Simple Custom CSS". They enable a preview of the changes on the website during the modification of the properties of individual elements saved in CSS files. However, it must be remembered that the installation of every add-on requires a verification of its compatibility with the installed version and often the issue of additional commands, which may cause problems, especially for inexperienced users.

6. Modification of templates in Drupal

The default installation of Drupal offers only two templates. As in the majority of content management systems, after we move to the system administrator's panel, we get the possibility of simple modification of templates, consisting mainly in the selection of color schemes prepared for a given template. However, this option has a very convenient interface of modification of colors of the main elements of a template through a very intuitive and easy to use mechanism. The manual selection of color results in the generation of its RGB code, which is at the same time assigned to the selected element. After saving the above settings, we can see the direct effect on the website generated by Drupal.

This is, however, the only mechanism that distinguishes Drupal in terms of template modification. In the default installation, this system does not have a file editor that allows for editing and modifying their content directly from

the CMS interface. Therefore, we should save all changes we make with the use of the FTP client. As in the case of the default installation of WordPress, the files downloaded through the FTP are modified locally on the basis of the set parameters of the element indicated by Developer Tools. It, therefore, uses a similar pattern (Figure 5), whereas on-line modification is done mainly with the use of the FTP protocol.

As in the case of WordPress, Drupal also allows for installing additional modules enabling to edit CSS files directly from the system level. Popular plug-ins such as CSS Editor, Lice Theme and Live CSS often require additional configuration and verification of compatibility with the version of the plug-in with the version of the installed content management system. Also, it is important to remember about certain limitations resulting from the configuration of accounts on the servers on which our website is located. The installation of dedicated plug-ins should, therefore, be treated as an additional option without which we cannot modify the styles specifying the template using only a locally installed editor, the free FTP client, and Developer Tools embedded in the browser.

7. Conclusions

Content management systems are a technology increasingly used to build websites. By definition, they are the tools for the flexible formation of website content. The layout of a website built with the use of a CMS is imposed by a ready-made template. The administrator interface of the content management system enables only a minor modification of the template. However, the conducted comparative analysis shows that the combination of two independent tools, i.e. a content management system with Developer Tools embedded in modern browsers enables a significantly greater interference in the template's structure, allowing at the same time for a relatively easy and almost unlimited modification of the template. Also, the analyzed methods of modification of a graphic template do not generate any additional costs, which satisfies the assumptions mentioned at the beginning of the paper.

References

Matysek, A., & Tomaszczyk, J. (2009). Systemy zarządzania treścią. *PTINT Praktyka i Teoria Informacji Naukowej i Technicznej, 17*(1-2), 35-44.

Nalepa, G.J., Ligęza, A., & Wojnicki, I. (2007). From content to knowledge: a perspective on CMS. *Automatyka, 11*(1-2), 217-226.

Prauzner, M. (2015). Nowoczesny system CMS w kształtowaniu treści i sposobu ich prezentacji on-line. *Edukacja – Technika – Informatyka, 6*(3), 290-295.

Wieczorkowski, K. (2015). Metodologia projektowania systemów zarządzania dokumentami CMS. *Zeszyty Naukowe Wyższej Szkoły Informatyki*, *141*(1), 60-81.
Wit, B. (2009). *Electronic commerce – Budowanie konkurencyjności przedsiębiorstwa w Internecie*. Lublin: Wydawnictwo Politechniki Lubelskiej.
Zakrzewski, L., & Stroińska, E. (2009). Rola internetowych systemów zarządzania treścią (CMS) w rozwoju społeczeństwa informacyjnego. *Zeszyty Naukowe. Studia Informatica/Uniwersytet Szczeciński, 23,* 205-214.

Websites

WordPress – official website, http://www.wordpress.org
Joomla! – official website, https://www.joomla.org
Drupal – official website, https://www.drupal.org
CSS – World Wide Web Consortium (W3C), https://www.w3.org/Style/CSS/
GNU/GPL License, http://www.gnu.org/licenses/licenses.html#GPL
Mozilla Firefox, http://www.mozilla.org/firefox/
Google Chrome, https://www.google.com/chrome/
Apple Safari, www.apple.com/safari/
W3Techs – Web Technology Surveys, https://w3techs.com/technologies/
BuiltWith® Pty Ltd, http://trends.builtwith.com/cms/country/Poland

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MANAGERIAL TOOLS' INFLUENCE ON A PLANNING PROCESS. RESULTS OF THE EXPERIMENT

Olaf Flak[1] and Kinga Hoffmann-Burdzińska[2]

Abstract

The main aim of the paper is to present the results of the experiment on the impact of management tools for the process of planning. It includes the theoretical foundations on the work of a manager using organizational techniques with the use of management tools to solve an organizational problem. Presented theoretical foundations are an introduction to test hypotheses which were verified with quantitative and qualitative data of an experiment in conjunction with non-participant observation. Analysis of these data enabled the authors to claim that the characteristics of managerial tools affect both the course of the organizational techniques, as well as the content of the solutions for the organizational problem.

Keywords: *project planning, managerial tool, management technique, system of organizational terms.*

1. Introduction

The idea how organizations perform changed during last decades from the view in the traditional organization theory (Scott, 1961) to interdisciplinary approach to organizations (Cummings & Kiesler, 2014) and combinations of narratives and analysis in explanation of organizations (Rowlinson, Hassard & Decker, 2014). However, there is still some cognitive gap in relations of main terms widely used in different approaches to organizations: the organizational technique, the organizational problem, and the managerial tool. The gap appeared concerning the influence of the last element – the managerial tool – on a way of work of a manager and using a proper organizational technique by this manager to solve the organizational problem. We can state the following research problem, which is claimed in a general research question: in what way does a managerial tool influence the process of using a particular organizational technique by a manager? The summary of the first theoretical

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background in the research which is the organization theory was described in Section 2.

The aim of the paper is to solve the research problem and answer the research question mentioned above, however, the conclusions of the research were planned to be valid only in relation to the group of participants of the research. According to the research problem there are two hypotheses posed by authors:

- H1. Features of a managerial tool do not influence a process of an organizational technique used by a manager.
- H2. Features of a managerial tool do not influence the content of a solution for an organizational problem.

The hypotheses and the effect of their verification were also planned to be valid only in relation to the group of participants of the research. Research methods used for the elaboration were an experiment and a non-participant observation. Research tools – online managerial tools – were prepared accordingly to the idea of the system of organizational terms (Flak, 2013b). This concept was the second theoretical background of the research, and it was presented in section 3. This paper contains:

- the view of an organization based on some elements of the traditional organization theory, such as the organizational technique, the organizational problem, and the managerial tool,
- the system of organizational terms as a methodological frame in recording organization performance,
- methods of research conducted to verify hypotheses presented above,
- quantitative and qualitative results of two experiments which allowed to verify the hypothesis H1 and hypothesis H2,
- further directions of research dealing with the use of managerial tools in organizational techniques.

2. Organization theory as the first background of the research

In the traditional approach, the organization is viewed as "a vehicle for accomplishing goals and objectives" (Scott, 1961, p. 7). In this meaning, this is the place where the human cooperation appears. There are four pillars of this approach: a division of labor, scalar and functional processes, a structure and a span of control (Scott, 1961, pp. 9-10). The next view of the organization added the superior position in the organization of a man who would have knowledge and techniques of acting on behalf of the organization in some way making organizations operating in the environment (Thomson, 1961, pp. 12-13). The role of managers and members of the organization were widely stressed in the next works on organization theory (Gibson, 1966, pp. 244-245).

The vision of the organization changed gradually, and a few years later the need for the organization theory development appeared. This need enhanced with several dimensions such as a rising role of group processes, meaning of organizational community, abstract and relative values instead of absolute ones, efficacy of planning, meaning of leadership (Scott, 1974, pp. 249-250). Just after this change, other assumptions appeared in the organization theory. Firstly, it was remarked that managers use different methods to obtain similar objectives, despite the fact there might be some similarities in management styles. Secondly, authors emphasized the role of objective measures in making managerial decisions. Thirdly, methods of managing were claimed to be adjusted to the social aspects of organizations (Negandhi, 1975, pp. 334-335). It is worth adding that in the next decades, many changes in the organization theory appeared, especially the narrative approach and adequate research methods (Czerniawska-Joerges, 1997). They gave a foundation of conclusions that the boundaries between material and immaterial aspects of organizations could not be maintained in the organization theory anymore (Washbourne & Dicke, 2001, p. 107). In the recent years, new approaches were created. They tried to recognize how to develop organization theory, by a discussion between theorizing top-down vs. bottom-up theorizing (Shepherd & Sutcliffe, 2011) and theorizing within one literature or across multiple bodies of literature vs. theorizing with implicit assumptions or explicit constructs in the focal publications (Suddaby, Hardy & Huy, 2011). Also, it was tried by an interdisciplinary approach to organizations (Cummings & Kiesler, 2014, pp. 11), and combinations of narratives and analysis in explanation of organizations (Rowlinson et al., 2014, pp. 252-260).

Moving back to the essence of the organization performance, it is worth saying that the central part of organization performance is an activity of people inside the organization (Popper, 1997, p. 101). Popper (1997, p. 101) remarks that we could not even say that the organizations "perform" themselves. This statement was a fundamental assumption in conceptualization in this research. As Negandhi (1975) claimed and Szarucki (2013, p. 171) reminded, functioning of organizations can be characterized by a description of organizational methods or techniques used by a human (the term "organizational techniques" will be used in a further part of the paper). The traditional approach to the organization gave a possibility of conceptualization the connection between the organizations and people activity within organizations. In this approach, organizational techniques usually have strictly specified procedures that have to be used in solving problems in an organization (Jerzak, 1994, p. 91). A general idea of a problem can be defined as a deviation between the state „what should be" and the situation „what is in reality" (Kepnera & Tregoe, 1965, p. 18). Referring to this definition, the organizational problem is a task

aimed at establishing possible optimal ways of acting in a particular situation in an organization (Mikołajczyk, 1973, p. 159). The literature presents a testimony that one of the most important ways of solving organizational problems is using instruments (Piłejko, 1976, p. 181). In management science, an instrument is defined as a tool or an appliance to do some action (Pszczołowski, 1978, p. 85). Thus, such an instrument – managerial tool – is in some way detached from a manager, his predispositions, and skills of using organizational techniques. An administrative managerial tool is an algorithmic and certain way of realization management functions, possible to be used by any manager (Flak, 2013a, p. 195). Of course, there are some restrictions and constraints of managers behavior described by Giddens (1979), such as interpretive schemes, mutual knowledge, dependence on social interaction (Giddens, 1979, pp. 83-96). However, these factors were not researched, and they were taken as similar in the group of the research.

3. The system of organizational terms as the second background of the research

The system of organizational terms is a methodological idea in management science which was projected to record the organization performance using the observation technique along with management tools as research tools. The concept was created by Flak (2007, 2008) with the conceptualization of the organizational reality, then other elements of the system have been created, such as definitions of organizational terms (Flak, 2009) and methods of gathering data about the organization performance (Flak, 2010).

The system of organizational terms is based on a few key assumptions. Firstly, as it was mentioned in the introduction, organizations perform by organizational techniques used by a manager and members of an organization for organizational problem solving. Using organizational managerial techniques is connected with using an appropriate managerial tool (Flak, 2013a).

Secondly, the ontology of organizational environment consists of elements typical for the case of ontology development (Staab & Studer, 2009, pp. 2-8). The definition of this ontology is as follows. The elements of the universe of the organizational environment described by the system of organizational terms: D = {factT1, factT2, factT3, …, factE1, factE2, factE3, …}

The elements of the ontology are facts. The abbreviation “T” means it is a thing, and “E” indicates events. Counting facts by numbers is possible. Facts appear within time. Their increasing values are not constrained by any number. The set of relations on D is as follows: R = {name of factT1, name of

factT2, name of factT3, …, name of factE1, name of factE2, name of factE3, …, creates, starts} (Flak, 2013b).

Thirdly, the epistemology uses a merger of a quantitative and qualitative approach that leads to using a mixed-method in research on organizational reality (Symonds & Gorard, 2010, p. 121). A research method in the system of organizational terms ought to assure a rationality in cognition by indirect reference to a subject of cognition, indeed the thing that is a sense of the subject (Heller, 2009, p. 114). There is an observation used in the system of organizational terms. However, it is applied in a slightly wider meaning than this is understood in social sciences (Little, 1993).

Fourthly, the measuring tool in the system of organizational terms is a managerial tool used within the organizational technique to solve an organizational problem. The idea of a managerial tool in the system of organizational terms is based on an assumption that management means creating "things" in an efficient (Kotarbiński, 1969, pp. 127-141) and effective (Kotarbiński, 1969, pp. 113-116) way. In original "Managing is about getting things done" (Chopraa & Gopal, 2011, p. 63). The idea is also fostered by an idea of a behavioral unit;that is consistent behavior lasting any time, perceived as an activity of a person or a group. A behavioral unit has its beginning and ending, and concrete meaning in the particular context of actions (Hatfield & Weider-Hatfield, 1978, pp. 44-50).

Finally, the system of organizational terms belongs to the systemic approach (Bertalanffy, 1950, pp. 134-165) and is based on rules of concluding, which origins from a formal logic (Crane, 2012, p. 31).

As it was presented above, the system of organizational terms is a methodological framework for conducting research in the area of organization performance by recording managers behavior who use organizational techniques to solve the organizational problem with the managerial tool.

4. Methodology of the research

The system of organizational terms presented above was a basis of the methodology of the research and a premise to use online management tools as research tools during the observation of managers' work. There were two research methods used: an experiment and a non-participant observation, with the experiment as the main method used by the researchers.

The experiment was organized in two stages: in November 2015 and March 2016. In both cases, participants of the research were students of management at one of the Silesian universities. They were challenged by a real organizational problem that was teamwork planning on bachelor's thesis. We have to mention that preparing bachelor's theses in groups is a quite new

and original approach to organizing studies, and it can be acknowledged as a special one. On the first stage of the experiment, there were 10 groups and on the second – 6 groups. The result achieved by a group was treated as an effect of work performed by a single manager. This was reasonable from the point of view of research objectives and did not influence on the verification of the hypotheses.

Groups taking part in the experiment got the same organizational problem to solve with the use of two organizational techniques – technique of setting goals (1) and technique of creating tasks (2) – with online managerial tools corresponding with them – the Goaler (1) and the Tasker (2). The researcher gave the following instruction: "Prepare a plan consisted of goals and tasks, which will allow you to prepare your team project (bachelor theses)".

Every phase of the experiment consisted of two stages and two general types of management tools – empty sheets of paper (A) and online management tools (B). Although treating empty sheets of paper as a managerial tool could raise doubts, it fulfills assumptions of a managerial tool's definition's presented in an introduction. Blank sheets of paper have a feature that causes a zero measurement error as a consequence of so-called bias influence (Olson, 2006). The feature means that a tool in a form of empty sheets of paper is simply clear (not written). Thus, we can assume that its influence on a manager is always the same taking into consideration a graphical form (content structure, suggested actions, managing attention, etc.). Additionally, the influence is the same in the case of organizational techniques used in the experiment, because empty sheets of paper are equally an appropriate tool for setting goals and creating tasks.

In the case of 10 groups participating on the first stage of the experiment, at start managers had to plan their work on empty sheets of paper, and when they finished, they planned projects using online management tools (the Goaler and the Tasker described above). Six groups from the second stage of the experiment worked in reversed order of using a particular managerial tool. First, they planned using online managerial tools and then they did the same on empty sheets of paper. Both stages of the experiment were done during the 2-hour sessions (120 minutes).

In the experiment, the researcher used a non-participant observation because all actions of students were registered by managerial tools (empty sheets of paper, the Goaler and the Tasker). Hereby, one of the main assumptions of the system of organizational terms was executed. It states that managerial tools are simultaneously measurement tools. There was a survey conducted after the first stage of the experiment. Results of the second stage of the experiments were discussed with participants. Information gathered in

this way was very helpful in formulating ending conclusions and verifying the hypotheses.

Although the participants of the research were students of management, in order to keep a consistent vocabulary referring the quantitative and qualitative results of the research in the Section the leaders of groups of students were named as managers. The authors of the paper are conscious that this is a kind of a metaphor – the students were not real managers in companies – despite this, the authors assumed that they acted in the small teams as in small organizations using common organizational techniques and management tools.

Because main measurement tools were the Goaler and the Tasker, this is necessary to explain their functionality and other features. The management tools used in the research have following features:

- they split a process of management into small parts, according to the idea of a "unit of behavior" (Curtis, Kellner & Over, 1992),
- a result of using management tools is an object that is an effect of a management process (Flak, 2013a),
- a possibility of registering organizational resources as results of processes conducted within the organization (Glykas, 2011, p. 11).

According to these rules, the form of the Goaler consists of several features of the goal. A manager who used the Goaler could describe a goal as presented in Table 1.

Table 1. Features of goals in the Goaler

Features of a goal	**A way of description**
A vision of the future:	Form – 300 characters
A short name of the goal:	Form – 60 characters
The period or date:	Buttons and lists of options
Measurers x 10:	Form – 300 characters
Is the goal real to achieve?	List of options: {choose, yes, mostly yes, partly, mostly no, no}
Does the goal belong to your duties?	List of options: {choose, yes, mostly yes, partly, mostly no, no}
Create the goal based on green box details:	Form – 480 characters
The goal is in the field of:	List of options: {choose, finance, human resources, logistic, management, marketing, products, and services}
The goal is:	List of options: {shortterm, longterm}
The goal belongs to:	List of options: {strategy, operation}
The goal is valid:	List of options: {always, occasionally}
The goal concerns:	List of options: {one person, a group of people}

Tasks can be described by several features, such as time intervals i.e. days, weeks or months, doers of tasks, the way of tasks performance, etc. The form of the Tasker consists of several features of the tasks described in Table 2.

Table 2. Features of a task in the Tasker

Features of a task	A way of description
A short name of the task:	Form – 60 characters
To which goal the task belongs:	List of options: dynamic list of names of goals
A verb what is to do:	Form – 120 characters
Names who is to do this (x9):	Form – 60 characters
How long does it take:	Lists of options
Add details how to do this:	Form – 120 letters
Add details where to do this:	Form – 120 letters
The task is in the field of:	List of options: {choose, finance, human resources, logistic, management, marketing, products, and services}
The task is:	List of options: {choose, important, quite important, not important}
The task is:	List of options: {choose, urgent, quite urgent, not urgent}
The task appeared:	List of options: {suddenly, expected}
The task belongs to:	List of options: {strategy, operations}

The examples of prototypes of such tools are available at transistorshead.com. The tools are original and based on the system of organizational terms designed by Olaf Flak. There is a possibility of testing such tools at transistorshead.com. The first account (to see how a manager used the tools) – login name: john.smith, password: smith. The second account (to create goals and tasks) – login name: anonymous.manager, password: manager.

5. Quantitative results of the research

Results of the non-participant observation done with online managerial tools, according to the research method presented the Section 4, allowed to collect data on a process of organizational techniques used by a manager. These techniques deal with the setting of goals (1) and tasks (2), where the Goaler (1) and the Tasker (2) were used appropriately. Particular actions within managerial techniques were registered, e.g., goal setting, its editions or deleting it from the list of goals.

Table 3 contains quantitative parameters of using managerial techniques by 10 managers on the first stage of the experiment, and Table 4 presents the results of planning delivered by six managers on the second stage of the experiment. Table 3 shows mean values of parameters on both stages of the experiments. It is important to emphasize that the stages of the experiment were indeed two separate experiments conducted among different groups of students.

Table 3. Quantitative findings. Firstly – on sheets of paper (X) and, secondly – using online managerial tools (Y)

		Managers									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
No.		**Measures**									
A	duration of teamwork (minutes)	81	64	57	47	52	64	53	58	37	57
B	number of goals	7	10	2	1	2	2	4	1	1	2
C	number of tasks	18	18	14	6	12	7	15	13	8	9
D	number of created objects (goals and tasks)	25	28	16	7	14	9	19	14	9	11
E	number of actions	124	41	40	27	40	53	21	44	22	45
F	number of created objects (goals and tasks) per minute	0.30	0.43	0.28	0.14	0.26	0.14	0.35	0.24	0.24	0.19
G	number of actions per minute	1.53	0.64	0.70	0.57	0.76	0.82	0.39	0.75	0.59	0.78
H	number of goals editions	13	1	0	0	0	2	0	4	0	0
I	number of tasks editions	7	7	2	5	3	2	2	2	0	0
J	number of editions by object (goal)	1.85	0.10	0	0	0	1.00	0	4.00	0	0
K	number of editions by object (task)	0.38	0.38	0.14	0.83	0.25	0.28	0.13	0.15	0	0

In the scenario of managers using empty sheets of paper (X) first and then online managerial tools (Y), despite the fact that duration time of an experiment was limited (120 minutes), managers used it in different proportions working on a project planning. The longest login to managerial tools took 81 minutes, the shortest one only 37 minutes. The number of minutes influenced the number of actions done by managers on the second stage of this phase. Generally, the more minutes a manager spent with the tools, the more actions he created (i.e. created more goals and tasks, checked if they are correct, tested the functionality of tools, etc.). The interesting finding is that all managers were given the same project to describe by tasks and goals. Despite this fact, they chose completely different ways of doing it.

There were also big differences in a number of goals and tasks created by each manager. The exact numbers are shown in parameters B and C of Table 1. In this area, there are also differences to be seen in the managers' approach to planning. Some managers created a few goals and many tasks (such as the third manager – 7 tasks per 1 goal). The others chose another proportion of goals and tasks – 7 to 18 (the first manager) or 2 to 9 (the tenth manager). However, there are no dominant rules of proportions between goals and tasks.

As we can see in parameter G (Table 3), the fastest in planning was the first manager. The slowest planning process was the seventh manager. His speed was a quarter of the first manager's speed. What is more interesting, slow-planning managers (the seventh and the fourth ones) did not edit their goals. They tried to create accurate objects at once.

A comparison of goals' and tasks' numbers of the edition is surprising. Goals were edited only by four managers and the tasks were edited by eight managers. Only two managers were focused on setting goals and establishing tasks without correcting them in any way. On the contrary, the tasks were edited many times by twice as much of managers compared to the editing of the goals (comparison of the parameters J and K).

As it was presented in Table 3, among a group of 10 managers there was no dominant, quantitative route of project planning. Nevertheless, there are some similarities in the numbers of goals and tasks, in the speed of planning or an approach to divide issues into goals and tasks.

Table 4. Quantitative findings. Firstly – using online managerial tools (Y) and, secondly – on sheets of paper (X)

		Managers					
		1	**2**	**3**	**4**	**5**	**6**
No.	**Measures**						
A	duration of teamwork (minutes)	15	59	24	23	49	34
B	number of goals	2	3	1	1	1	2
C	number of tasks	9	11	8	5	8	5
D	number of created objects (goals and tasks)	11	14	9	6	9	7
E	number of actions	26	84	29	32	21	37
F	number of created objects (goals and tasks) per minute	0.73	0.24	0.38	0.26	0.18	0.21
G	number of actions per minute	1.73	1.42	1.21	1.39	0.43	1.09
H	number of goals editions	2	1	0	0	0	1
I	number of tasks editions	2	10	5	5	0	2
J	number of editions by object (goal)	1.00	0.33	0.00	0.00	0.00	0.50
K	number of editions by object (task)	0.22	0.91	0.63	1.00	0.00	0.40

As it was presented in Table 4, in the scenario in which the managers in the beginning used online managerial tools (Y), and later on empty sheets of paper (X), results of their work were very different. The time of work with online tools (from login to logout) also was different within this particular group – the shortest time was 15 minutes and the longest was 59 minutes – but many goals created in the Goaler were congenial and very low. Three managers created only one goal, and two other managers created two goals. The number of tasks that were created within particular goals was more

various. Only manager 2 set a number of 11 tasks, what is easy to explain because he formed three goals.

As we can see in parameter G (Table 4), the fastest in planning was the first manager – he did 1,73 actions per minute. The slowest planning process can be observed in the case of the fifth manager – only 0,43 actions per minute. In Table 4 we can see that an edition of goals was done only by three among six managers. This means that three of respondents with no doubts set the goal and were working on tasks' creation. It is interesting that the tasks were edited by five managers, and only one did not correct his tasks.

By the analysis of the research results (Table 4) we can conclude that on the second stage of the experiment, there was not any dominant way of project planning, very similar to the first stage of the experiment. Additionally, it was difficult to find some obvious similarities in using organizational techniques by managers and identify general rules of proceeding.

Table 5 presents a comparison of quantitative findings between first and second stage of the experiment.

Table 5 contains mean values of parameters describing activities of managers using online managerial tools during both stages of the experiment. Although, these are means, differences in the use of organizational techniques with managerial tools as the Goaler and the Tasker (Y) are significant depending on the use of tools before or after planning on empty sheets of paper (X).

As a first point (parameter A), managers were working with online managerial tools (Y) 67% longer, when before that they had set goals and tasks on empty sheets of paper (X), thus, when they had had more information on conditions of a project.

Secondly, a number of goals and tasks, in the case of having a "paper" version of a plan (X), was twice higher than in the situation of starting planning from using online managerial tools (Y).

Thirdly, working on the second stage of the experiment with online managerial tools (Y) using organizational techniques was much faster than in the case of having an initial version of a plan on empty sheets of paper (X). The Speed of using organizational techniques is described by two parameters: the number of created objects (goals and tasks) per minute and the number of actions per minute.

Table 5. Quantitative findings. Comparison between 1st and 2nd phase of the experiment

		Mean values of parameters in:	
		the first stage of the experiment – starting with empty sheets of paper (X), and later planning with online managerial tools (Y)	**the second stage of the experiment – starting with online managerial tools (Y), and later planning on empty sheets of paper (X)**
No.		**Measures**	
A	duration of teamwork (minutes)	57.00	34.00
B	number of goals	3.20	1.67
C	number of tasks	12.00	7.67
D	number of created objects (goals and tasks)	15.20	9.33
E	number of actions	45.70	38.17
F	number of created objects (goals and tasks) per minute	0.26	0.33
G	number of actions per minute	0.75	1.21
H	number of goals editions	2.00	0.67
I	number of tasks editions	3.00	4.00
J	number of editions by object (goal)	0.70	0.31
K	number of editions by object (task)	0.25	0.53

The number of created objects (goals and tasks) per minute is accordingly 0.26 items (first stage of the experiment) and 0.33 items (second stage of the experiment). However, the number of actions per minute is respectively 0.75 and 1.21 items. This means that managers without drafts of plans created on empty sheets of paper (X) acted much faster using organizational techniques and online managerial tools (Y) than in the case of using both kinds of tools (X and Y) in reversed order. This is quite striking, especially that online managerial tools (Y) for respondents were something new, and the way of using them, in the beginning, requires some time for reflection.

Fourthly, the number of goals' and tasks' editions was inversely depending on the stage of the experiment. Managers corrected goals in the Goaler (Y) in the case of having paper drafts of plans (X) more often than when filling in goals in the Goaler (Y) was done at first. However, in the case of tasks the dependence was inverse. Detailed values showing the phenomena are parameters H, I, J, K in Table 5.

6. Qualitative results of the research

Managers prepared their project plan. Results of their work were analyzed as describing goals and tasks by the participants of the experiment. Firstly, for all cases, it was checked if the work results were different or similar in paper and online version. Secondly, the effects of work done by two managers were selected for further analysis. For this matter, the authors once selected managers who prepared the most similar versions of project plans and once managers who created the most different versions.

Table 6. The most different versions of the project (manager 5 in Table 3)

Version X (plan on the paper sheets)	**Version Y (goals and tasks saved in online tools)**
Goal 1: not written	**Goal 1: Writing and defending the bachelor's thesis**
Tasks to achieve the goal 1: **1. Choosing the subject of the project** 2. Delegating tasks and duties 3. Planning the structure of the project **4. Formulating a hypothesis** **5. Giving tasks to group members in the first stage of work** 6. Collecting materials 7. Closing the first stage of the project 8. Starting the second stage of the project 9. Constructing a questionnaire **10. Conducting a survey** 11. Conducting interviews 12. Collecting results **13. Describing results** 14. Closing the second stage of the project 15. Starting the third stage of the project **16. Collecting literature for the case study** 17. "Own" summary of the project **18. Giving the text to the promoter** 19. Correction of the text 20. Making a PowerPoint presentation 21. Closing the project and appearing on the exam	Tasks to achieve the goal 1: **1. Choosing the subject of the project** – select the subject according to interests of the group **2. Formulating a hypothesis** **3. Tasks division on the first stage of work** 4. Preparing a survey and **conducting research, elaborating results** and creating charts **5. Designing a case study – gather information from the literature** and the interview with coach 6. Thesis defending – **giving the text to promoter** and pass the exam on 4,5 or 5 grade

The Tables 6, 7, 8 and nine present the content recorded by online tools (the first stage) and notes made by those managers (the second version of both stages of the experiment).

As it was mentioned above the authors conducted the first and the second stage of the experiment. The first stage of the research brought the following conclusions concerning the most different version of the plan (Table 6).

In the first version of the task within the first stage of the experiment, the manager 5 wrote a lot of tasks (21 items) and not one goal on the sheet of paper. Tasks presented in a very detailed way show what has to be done in the project. In the second version (online managerial tools) the manager set one goal and six tasks which were means to achieve the goal. The most similar version of the project in the first experiment is presented hereinafter in Table 5.

Table 7. The most similar versions of the project (manager 4 in Table 3)

Version X **(plan on the paper sheets)**	**Version Y** **(goals and tasks saved in online tools)**
Goal 1: Writing and defending the bachelor's project	**Goal 1: Writing the bachelor's project**
Tasks to achieve the goal 1: **1. Preparing** **a) meeting and choosing the subject** b) allocation of duties **c) collecting materials** **2. Writing** a) Stage 1: - familiarization with materials - analysis and selection materials and methods b) Stage 2 **- table of content** **- preparing a bibliography** - chapter I (theoretical) - chapter II (**research): projecting research, conducting it, analysis of its results and conclusions** c) Stage 3 – summary **3. Promotor's acceptance of the project's content** 4. Defending the project	Tasks to achieve the goal 1: **1. Preparing – meeting and choosing the subject** **2. Collecting materials** **3. Writing – table of content** **4. Writing – bibliography** 5. Individual interviews with employees of the examined organization **6. Research results' analysis – preparing charts and description of results** **7. Conclusions –** linking the theory with research results and conclusions
Goal 2: not written	**Goal 2: Defending the bachelor's project**
Tasks to achieve the goal 2: not written	Tasks to achieve the goal 2: **1. Promotor's acceptance** – sending the whole elaboration 2. Learning – preparing a presentation and learning for the final exam

The similarity of both project versions concerns more the content of projects than its structure. It is very well shown that the structure of the projects is slightly different in the presented versions. There are aspects of both versions of the project which were difficult to compare.

For the second stage of the experiment, in which the order of planning versions was reversed, the most different versions of plans selected from all groups are presented below (Table 8).

Table 8. The most different versions of the project (manager 4 in Table 4)

Version X **(goals and tasks saved in online tools)**	**Version Y** **(plan on the paper sheets)**
Goal 1: Bachelor's thesis Criteria: **choosing the topic, gathering materials** and creating the table of content, **tasks assignment, closing the semester and passing exams, passing the seminar classes**	Goal 1: Writing and defending the bachelor's thesis Criteria (miles stones): **choosing the topic, gathering materials, work assignment**, **closing the semester** and passing exams, **passing the seminar classes**, thesis defending
Tasks to achieve the goal 1: **1. Chapter I** – meritorical issues; detailed bibliography; assumptions and **theses** within the project **2. Chapter II – empirical part**; conducting research in an organization and an analysis of data gathered in an organization. **3. Chapter III** – conclusions; **defending** theses from Chapter I **4. Summary**; summary of theses and defending them. **5. Learning** the thesis	Tasks to achieve the goal 1: **1. Chapter I** – formulating **theses** **2. Chapter II – empirical part** **3. Chapter III** – defending and confirming theses 4. Introduction and **summary** **5. Learning** (preparing for the final exam)

The versions prepared by the managers in the second stage of the experiment seem to be more similar to each other. Nevertheless, with a view to the case intensity, it is to be seen that version X (planning with online tools) is more detailed. Version Y is more synthetic and does not contain all information on the issue. Furthermore, there is a difference in the names of goals set in the project. We can say that the structure of both plans is similar, but the content differs in details.

In the second stage of the experiment, manager 2 prepared the most similar versions of the project. The results of this work are presented in Table 9.

The versions of the project presented in Table 9 are very similar. Not only the content is almost the same, but also the words used by the manager to describe goals and tasks. Both versions display a high level of complexity and detail.

Table 9. The most similar versions of the project (manager 2 in Table 4)

Version X (Goaler and Tasker)	**Version Y (paper sheets)**
Goal 1: **Preparation for bachelor's thesis writing**	Goal 1: **Preparation for bachelor's thesis writing**
Tasks to achieve the goal 1: **1. Recruiting group members** **2. Choosing as subject** **3. Choosing a promoter**	Tasks to achieve the goal 1: **1. Choosing a promoter** **2. Recruiting group members** **3. Choosing a subject**
Goal 2: Writing bachelor's thesis 70 pages in length	Goal 2: Writing bachelor's thesis
Tasks to achieve the goal 2: 1. Choosing and according to the subject with a promoter **2. Tasks' division among group members** **3. Writing an introduction** **4. Text** **5. Research** **6. Summary** **7. Thesis setting**	Tasks to achieve the goal 2: **1. Tasks' division among group members** 2. Gathering materials **3. Writing an introduction** **4. Text** **5. Research** **6. Summary** and conclusions **7. Thesis setting** **8. Presentation**
Goal 3: **Defending thesis** Getting the diploma	Goal 3: **Defending the bachelor's project**
Tasks to achieve the goal 3: **1. Preparing for a thesis defending** **2. Defending the thesis**	Tasks to achieve the goal 3: **1. Learning for a thesis defending** **2. Defending the thesis** and celebration

The qualitative analysis of the material gathered from two experiments allows to see that planning projects by managers within each stage of the research (the first and the second stage of the experiment) has some specific features. All managers more or less precisely planned their projects, but in the first stage of the experiment, the versions of plans (on the paper and using online tools) were more different from each other. Managers were more creative writing plans on paper sheets than planning with the Goaler and the Tasker. In the second stage of the experiment, all managers prepared quite similar versions of plans. In this case, they started with online tools and afterward planned their projects on paper sheets. The most similar versions of the project were not challenging to identify, but the most different versions of the project were more difficult to choose. Facing the most similar versions of the projects in both stages of the experiment, we/you can see that in the second one the manager achieved an almost perfect projection of his plan. The most different versions in both stages are very different from each other considering the elements which were mentioned as differences.

The results of the work generated during experiments and the in-depth analysis of them led to a general conclusion that the order of preparing versions of the projects matters and has an influence on managers in the process of planning.

7. Conclusions

The primary goal of the paper was to prove or disprove two hypotheses presented in the introduction. Their verification is not valid for all cases of the examined phenomena. However, the results of the audit consider only the group of the participant who took part in the experiment.

In the paper authors also presented theoretical frames of the research: view of the organization performance based on the traditional organization theory and the system of organizational terms as a methodological concept in management sciences. The data in the research was gathered by using a mixed-method in research mainly through the non-participant observation conducted with managerial tools that were measurement tools, and also by the means of a survey.

Based on the quantitative results of the experiment described in Section 5, it can be assumed that the hypothesis H1 is false. The features of the managerial tool influenced the process of the organizational technique used by a manager. If the direction of the use of the neutral tool (empty sheet of paper) and the online managerial tool is different, the actions were taken during the process of planning (setting tasks as well as describing goals) are totally different. As it was described in Tables 3, 4 and 5, the differences are to be found in nearly all the parameters. For this reason, it is possible to claim that hypothesis H1 is false. There may be circumstances in which the versions of the planning would be similar, but the result of the verification of the hypothesis H1 should be relatively clear.

Simultaneously, in Section 6 discussing the qualitative results of the research, it was pointed out that the influence of the features on the content of solutions for an organizational problem was also significant. In the first stage of the experiment, the online and paper versions of the plan differed from one another very much. In the second stage of the experiment, the differences were much smaller. Furthermore, in the first phase of the experiment it was hard to find the same versions of the solutions' content created by any manager and in the second stage of the experiment, it was even more difficult to find different versions of the solutions' content created by any manager. This leads to the general conclusion that the features of the tool (or empty sheet of paper either the online managerial tool) have a strong influence on the content of solutions. It must, therefore, be assumed that the hypothesis H2 is false.

These conclusions let us question how much any managerial tool influences a managers' work – both the organizational technique and the content of solution for the organizational problem. We assume that further research on this topic is extremely needed, especially with the set of other managerial tools for solving other organizational problems, such as decision

making, motivating, creative thinking and others (Verboncu & Zeininger, 2015, p. 604).

It is worth adding that having patterns of solving organizational problems lets us improve the machine learning (Gacenga, Cater-Steel, Toleman & Tan, 2012, p. 95). Additionally, from the perception point of view the scientists construct the ontology of the scientific theories, which directs the active search of information. Such information, gathered by such experiments, gives the solution to the contradiction between theory and experiment should be considered in more details (Storozhuk, 2007, p. 378).

References

Bertalanffy, L. (1950). An outline of general system theory. *British Journal of Philosophy of Science, 1*, 134-165.

Chopraa, P.K., & Gopal, K.K. (2011). On the science of management with measurement. *Total Quality Management, 22*(1), 63-81.

Crane, T. (2012). Philosophy, logic, science, history. *Metaphilosophy, 43*(1-2), 20-37.

Cummings, J.N., & Kiesler, S. (2014). Organization theory and the changing nature of science. *Journal of Organization Design*, *3*(3), 1-16.

Curtis, B., Kellner, M., & Over, J. (1992). Process modelling. *Communications of the ACM, 35*(9), 75–90.

Czerniawska-Joerges, B. (1997). *Narrating the Organization: Dramas of Institutional Identity*. Chicago: University of Chicago Press.

Flak, O. (2007). Układ wielkości organizacyjnych jako obiekt badań. In A. Nalepka (Ed.), *Organizacje komercyjne i niekomercyjne wobec wzmożonej konkurencji oraz wzrastających wymagań konsumentów* (pp. 64-74). Nowy Sącz: Wyższa Szkoła Biznesu – National Louis University.

Flak, O. (2008). Konceptualizacja układu wielkości organizacyjnych. In A. Nalepka (Ed.), *Organizacje komercyjne i niekomercyjne wobec wzmożonej konkurencji oraz wzrastających wymagań konsumentów* (pp. 13-21). Nowy Sącz: Wyższa Szkoła Biznesu – National Louis University.

Flak, O. (2010). Wymiary i wielkości mierzone w układzie wielkości organizacyjnych. In A. Nalepka & A. Ujwary-Gil (Eds.), *Organizacje komercyjne i niekomercyjne wobec wzmożonej konkurencji oraz wzrastających wymagań konsumentów* (pp. 11-21). Nowy Sącz: Wyższa Szkoła Biznesu – National Louis University.

Flak, O. (2013a). Concept of managerial tools based on the system of organizational terms. In: R. Knosala (Ed.), *Innovation in Management and Production Engineering* (pp. 187-197). Opole: Oficyna Wydawnicza Polskiego Towarzystwa Zarządzania Produkcją.

Flak, O. (2013b). Theoretical foundation for managers' behavior analysis by graph-based pattern matching. *International Journal of Contemporary Management, 12*(4), 110-123.
Gacenga, F., Cater-Steel, A., Toleman, M., & Tan, W-G. (2012). A proposal and evaluation of a design method in design science research. *The Electronic Journal of Business Research Methods, 10*(2), 89-100.
Gibson, J.L. (1966). Organization theory and the nature of man. *The Academy of Management Journal*, *9*(3), 233-245.
Giddens, A. (1979). *Central Problems in Social Theory*. Berkeley, CA: University of California Press.
Glykas, M.M., (2011). Effort based performance measurement in business process management. *Knowledge and Process Management, 18*(1), 10-33.
Hatfield, J.D., & Weider-Hatfield, D. (1978). The comparative utility of three types of behavioral units for interaction analysis. *Communication Monographs, 45*, 44-50.
Heller, M. (2009). *Filozofia nauki. Wprowadzenie*. Kraków: Petrus.
Jerzak, M.W. (1994). *Organizatoryka inżynierska*. Częstochowa: Wydawnictwo Politechniki Częstochowskiej.
Kepnera, Ch.H., & Tregoe, B.B. (1965). *The Rational Manager*. New York: McGraw-Hill.
Kotarbiński, T. (1969). *Traktat o dobrej robocie*. Wrocław, Warszawa: Zakład Narodowy im. Ossolińskich.
Little, D. (1993). Evidence and objectivity in the social sciences. *Social Research, 60*(2), 363-396.
Mikołajczyk, Z. (1973). *Metody organizowania pracy w warunkach nowoczesnego przemysłu*. Warszawa: PWE.
Negandhi, A.R. (1975). Comparative management and organization theory: A Marriage Needed. *The Academy of Management Journal*, *18*(2), 334-344.
Olson, K. (2006). Survey participation, nonresponse bias, measurement error bias, and total bias. *Public Opinion Quarterly, 70*(5), 737-758.
Piłejko, K. (1976). *Prakseologia – nauka o sprawnym działaniu*. Warszawa: PWN.
Popper, K.R. (1997). *W poszukiwaniu lepszego świata*. Warszawa: KIW.
Pszczołowski, T. (1978). *Mała encyklopedia prakseologii i teorii organizacji*. Wrocław-Warszawa-Kraków-Gdańsk: Zakład Narodowy im. Ossolińskich – Wydawnictwo.
Rowlinson, M., Hassard, J., & Decker, S. (2014). Research strategies for organizational history: A dialogue between historical theory and organization theory. *Academy of Management Review*, *39*(3), 250-274.
Scott, W.G. (1961). Organizational theory: An overview and an appraisal. *Academy of Management Journal*, *April*, 7-26.
Scott, W.G. (1974). Organization theory: A reassessment. *Academy Management Journal*, *17*(2), 242-254.

Shepherd, D.A., & Sutcliffe, K.M. (2011). Inductive top-down theorizing: A source of new theories of organization. *Academy of Management Review*, *36*(2), 361-380.
Staab, A., & Studer, R. (2009). *Handbook on Ontologies*. Berlin: Springer-Verlag.
Storozhuk, A. (2007). Perception: mirror-image or action? *Journal for General Philosophy of Science, 38*, 369-382.
Suddaby, R., Hardy, C., & Huy, Q.N. (2011). Where are the new theories of organization? *Academy of Management Review*, *36*(2), 236–246.
Symonds, J.E., & Gorard, S. (2010). Death of mixed methods? Or the rebirth of research as a craft. *Evaluation and Research in Education, 23*(2), 121-136.
Szarucki, M. (2013). Model of method selection for managerial problem solving in an organization. *Business, Management and Education, 11*(1), 168-187.
Thompson, V.A. (1961). *Modern Organization.* New York: Alfred A. Knopf.
Verboncu, I., & Zeininger, L. (2015). The manager and the managerial tools: Job description. *Review of International Comparative Management, 16*(5), 603-615.
Washbourne, N., & Dicke, W. (2001). Dissolving organization theory? *International Studies of Management and Organization*, *31*(3), 91-112.

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„MYSTERY SHOPPER" IN ANALYSING SERVICE QUALITY LEVEL AND SERVICE PROVISION PROCESSES IN THE HOTEL INDUSTRY IN POLAND

Robert Węglarz[1] and Mieczysław Morawski[2]

Abstract
The article presents the usefulness of an audit Mystery Shopper tool in analyzing the level of hospitality service quality in the hotel industry. The authors also demonstrate the validity and need to verify the quality of service processes using the aforementioned tools in the context of increasing competition, escalating customer expectations and challenges of the job market. The article also describes the results of conducted studies using an audit method, which emphasizes its importance and credibility as the tool for measuring service quality.
Keywords: *audit, competition, mystery shopper, service quality, hospitality, service provision process, hotel staff.*

1. Introduction

Hospitality services are directly related to the hotel staff responsible for providing them. Moreover, they create a service oriented process spread over time (it primarily refers to the facilities offering recreation and accommodation services, where residents spend a dozen or so days staying on average approx. six days). Even in the case of a basic accommodation service, i.e. the typical Bed & Breakfast one many people are involved in the service delivery process: starting from a receptionist, through housekeeping, technical staff, waiters, and cooks. The opportunities for becoming distinguished and achieving competitive advantage should be predominantly sought in the way of approaching and treating a visitor, the quality of provided services and mainly in the level of relationships between hotel staff and guests established as a result of services provision. Therefore we have to learn how to handle customers properly.

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The purpose of the article is to indicate the usefulness and the need in applying a Mystery Shopper as the tool for measuring service quality, service oriented attitude of staff and thus for identifying the quality defects in service oriented processes occurring in the hotel industry.

2. The specification of hospitality services

Running a hotel is directly linked to the skill of rendering hospitality services at a high and professional level, in the context of the highest possible satisfaction achieved by customers from the discussed hospitality service provision. Regardless of a given facility type, intense competition imposes the need of presenting the highest, versatile, substantive, interpersonal and conceptual competencies by hoteliers, including high strictly professional qualifications.

Service oriented hospitality, characteristic for the hotel industry, represents a far broader term than just service itself. The provision of hospitality services is associated with establishing unique relations, typical for a particular geographical, cultural and social sphere between a guest and a host. Thus rendering a hospitality oriented service remains a personal commitment undertaken by the host to ascertain both quality and the broadly approached comfort to be enjoyed by the visitors during their stay. The nature of such relations is crucial in this respect, since on the one hand, hospitality implies selfless, emotional focus on guests' needs, along with due respect, affection, and true involvement. However, on the other, these relations are also based on economic factors, because a hotel guest is not understood as a close friend hosted by another friend, but a customer participating in a specific contractual, economic relationship (Lashley, 2008).

Hospitality service represents an overriding idea on which professional hospitality business should be based on. It is a set of characteristic behaviors focused on meeting not only basic needs of sleep, hunger, thirst or safety, but also the higher rank expectations. In addition, hospitality service means a consistent set of behaviors towards guests, thus determining a given facility reputation (Kosmarzewska, 2012). In other words, it is also a complex process aimed at attracting and maintaining a customer through personal care about him/her, service quality or ensuring visitor's satisfaction from staying in a particular facility. As a result, hospitality service also stands for the style of care and attention offered to guests, which has a direct impact on the given hotel economic performance.

Therefore the difference between hotels known for good or worse reputation results from the concept of hospitality approached differently by the hotel staff, rather than just the type and standard of offered equipment, interior design or additional services included in the price.

The importance of service quality is the priority in hotels focused on longer, several days lasting stay of their guests. Usually, these hotels have an extended offer covering e.g. beauty treatment, physiotherapy, Spa & Wellness or other rejuvenation sessions, which is reflected in the intensity and versatility of relations with customers, who usually spend approx. 6 or more days in such facilities.

In these hotels, the following factors are of particular significance and importance: the atmosphere, holistic contact with guests, the discussed services, hospitality and the sense of comfort. Hotel staff apart from presenting high professional skills and qualifications should perform their job with utmost involvement, in a natural way, with detectable passion and satisfaction. The revealed enthusiasm facilitates establishing positive and desirable service oriented relations, manifested in the quality of provided services.

In terms of hospitality services, the problems of quality become the prevalent aspect in seeking competitive advantage, since the price in the times of increasing competition, as well as mature market and a conscious buyer ceased to function as the sufficient or effective tool in constructing the discussed advantage. This hypothesis is confirmed by the results of numerous studies. In one of the questionnaire surveys 67.3% respondents confirmed that the service ensuring the sense of approaching each guest individually remains the crucial factor in increasing the given hotel attractiveness, to be followed by Spa & Wellness services ranked at 23.1% and conference facilities – 9.6%. (as cited in Hotelarz, 2008).

It is also confirmed by Tokarz, who claims that "the number and qualifications of the employed staff represent the fundamental determinant of the service supply and quality level". The author also observes that "human resources, due to their intellectual and moral values as well as engagement in work, carry out the objectives of a tourist enterprise and, beyond doubt, decide about its success and future" (Tokarz, 2008).

The difficulty in service quality management consists not only in defining the specific expectations of particular customer groups but also in preparing the type of service responding to these expectations and continuous monitoring of customer satisfaction level. The level of meeting such needs and expectations is of decisive importance from the perspective of the offered services quality in a hotel. The assessment of service quality depends on the extent of service delivery, i.e. the degree of its compliance with the level of customer expectations. Therefore it can be adopted that the human factor is of key importance in the described relationships.

3. Quality challenges in hospitality services and their determinants

The problems of delivered services receive much coverage and diagnosis in the subject literature. The following factors determine the level of service quality:

- workmanship level and technical condition of the facility,
- quantity, quality, and modernity of equipment,
- selection, professional preparation and the specific characteristics, skills and involvement of employees,
- functional and organizational solutions (Witkowski & Kachniewska, 2005).

The above-listed factors can be supplemented by other determinants:

- company organizational culture,
- the set of rules, regulations, procedures, and job descriptions,
- the level of staff education and vocational preparation,
- individual, personal predispositions presented by employees,
- formal standardization requirements referring to hospitality facilities,
- non-formal factors – i.e. individual efforts undertaken by the facility owners.

On the one hand, the level of services offered by a hotel is determined by the service provider, i.e. a person delivering it, along with all his/her psychophysical features supported by knowledge and qualifications. But, on the other hand, by a customer as the arbiter of the rendered service, whose judgment results directly from the level of satisfaction achieved as a result of the received service. A hotel guest evaluates the experienced service quality based on two components:

- staff qualifications, material means for services provision, e.g. equipment available in a room, a restaurant, multipurpose halls, treatment rooms, etc., i.e. WHAT is offered by the hotel,
- employees' behavior, attitude, skills, communicativeness, i.e. HOW the customer is served (Witkowski & Kachniewska, 2005).

The level and quality of equipment are relatively easy to implement. The availability of goods at the existing market is extensive and depends solely on the amount of financial means to be invested, therefore the material factors for service provision can be achieved practically without major problems. Moreover, the Act dated 29th August 1997 on tourist services with later amendments, specifies precisely the minimum requirements for accommodation facilities, which use or aspire to operate under the name of a hotel, motel or a guesthouse and thus rated based on the standards marked as stars (from one to five stars). Nevertheless, it neither defines the attitudes nor behaviors, nor even the service standards. Chain hotels (foreign ones) have the written down service standards meeting which is verified two, three times

per year through mystery shopper audits. Independent facilities (private ones in most cases) do not have such standards and the delivered service rules and methods are both customary and declarative. The only distinguishing factor, offering such hotels the possibility to be recognized among the competition is their staff. In consequence, the success in the hotel industry is primarily dependent on the competencies presented by staff.

The statement functioning among hoteliers: "We all have a lobby. We all have comfortable bathrooms, and we all offer shampoos. It is the perception of value that makes us different". (Retrieved from http://www.hotelinfo24.pl/index.php?id=cytat) emphasizes the importance of hotel employees, who in cooperation with the owners and managers perceive and put into practice these values which reflect respect and kindness in approaching a guest and a customer. In the opinion of S. Marcus, the President of Marcus Hotels Corporation: "the walls put up either 50 years ago, or yesterday, have a relatively small share in the success of the best hotels worldwide. Usually, the most important factor enhancing sales in the hotel industry is the quality of provided services" (Marcus, 2007).

Due to the specific characteristics of hospitality services, their provision process is generally taking place in their customer's presence and participation, whereas its effect is measured by this customer satisfaction. A modern client expects to experience professional service standards, and if he/she decides that the competitive offer is better in this respect, he/she does not hesitate to change the service provider. In the opinion of Morawski, "no customer shall put up with the lack of competencies having an unlimited selection of possibilities to compare specific offers or solutions and standards applied by others" (Morawski, 2009). Without professional staff working at adequate positions no company can construct lasting competitive advantage and achieve above average results. It is emphasized by Morawski, who indicates that in order to achieve satisfactory cooperation results with clients a company needs a highly motivated, involved and competent employees, whose engagement and enthusiasm are based on reliable and substantive preparation (Morawski, 2009).

It is worth quoting similar standpoints expressed by the hospitality business managers. In the opinion of former Management Board President of Orbis S.A. Grelowski, (as cited in Hospitality, 2007) the hotel industry suffers from the absence of qualified senior management personnel, besides one of the major reasons among economic and occupational migration factors is the so-called: ownership type of despotism, as an irresistible sense of one's own success. According to the author it results from the so-called: "partisan type of management, which occurs as a result of a confrontation between a smart businessman and a professional hotelier, however, its most frequent effect is

a failure". In turn, Grzesiak, (as cited in Hospitality, 2006) an experienced hotel manager and the former President of HP Project company claims that the predominant mistake made by hotel owners is the fact that they do not recognize the importance of properly selected, qualified and aware of their goals staff. Until the "savings" are made on employees, many hospitality facilities will have much fewer guests and less money (Grelowski, as cited in Hospitality, 2007). Both attitudes and behaviors presented by staff have to be developed based on proper work environment, including adequate motivation system. Such system should result from an inner incentive and involvement in customer service. "Using the proverbial carrot and stick nearly anyone can be forced to do almost everything, except for one thing – become to like anything and in particular his/her job" (Blikle, 2014). It is also explained by Stor in one of the assessment methods for human resources management (HRM), who claims that when costs are maintained at a low level along with the absence of services expected by internal customers (stakeholders), then such HRM shall remain efficient, however, ineffective (Stor, 2012).

Therefore the role of personnel is to create e.g. proper attitudes and behaviors in the course of service provision, to deliver them at the level expected by guests and offer them added value in the context of broadly understood comfort (hygienic, thermal, acoustic, technical and mental) as well as satisfaction from staying in a particular hotel.

Having considered the opinions expressed by theoreticians and practitioners about the quality and level of customer service and also their own experiences as managers and experts, the authors of the presented publication have adopted that the key characteristics influencing hospitality at the highest level are as follows:

- approaching guests with due cordiality and interest,
- impeccable cleanliness and hygiene,
- high level of food and beverage services,
- kindness and integrity,
- ensuring the expected value.

4. Mystery Shopper audit as an effective tool for measuring quality and quality management of hospitality services

Mystery Shopper stands for a secret quality measurement tool for the context of customer service quality and the provided service standards. "Mystery shopping" audit offers the possibility for collecting complex information by means of passive observation – an auditor observes how customers are served, as well as active observation – when an auditor plays the role of a potential client presenting particular characteristics and acts as a purchaser him/herself.

The external audit – Mystery Shopper – represents one of the most effective methods verifying customer service standards in all hotel operational areas. In Western Europe, it has been known and applied since the 40s of the 20th century. Initially, such audit was functioning in the financial sector, and its main task was to observe bankers, diagnose frauds and irregularities in financial transactions. Modern, Mystery Shopper type of audits are performed practically in any area of economic activity. It is a standard procedure to carry them out periodically in the chains of stores, banks, hotels, petrol stations, telecommunication companies, car showrooms. It is increasingly often used in the state administration offices and territorial government units.

Beyond doubt, the crucial advantage of this method is its objectivism, independence and the fact that the audit is carried out in real time. An auditor does not collect declarative opinions of customers, but states the facts, hence the results are always valid. An audit combines both quantitative and qualitative methods. Auditors' work is based on observations and audit questionnaires, which include several hundreds of points subject to audit. An audit in a particular facility usually takes from two to four days, which allows thorough checking of the offered services quality and standards. An audit is carried out at all stages of customer service and at every position (starting from the moment of the first booking call or e-mail and finishing with check-out and leaving the facility) in all hotel units having contact with guests. It allows checking the quality of delivered services in detail, along with the attitude and behavior presented by staff.

On finalizing the audit its results are reported in adequate questionnaires to be followed by a detailed report from the entire visit. An audit provides information about:

- the hotel product and service offer,
- misconduct and negligence in customer service,
- skills in developing proper relations with customers,
- sales oriented skills,
- potential threats in the area of cost policy,
- opportunities for income improvement.

In general, an audit report has 70-120 pages, depending on the extent, number and types of hotel service areas. Apart from stating and in detail describing facts, it also presents post-audit recommendations, defines the areas of operational risk, spots requiring particular attention as well as scopes and directions of the necessary changes. The post-audit report encloses the specification and description of both, the particular places in a hotel and work positions where certain quality defects and shortcomings were encountered in terms of customer service, as well as technical and organizational problems, directly and indirectly, affecting customer satisfaction.

For managers, it is a valuable source of information about the attitude and work quality of their subordinate staff. It allows identifying the desirable behaviors, as an added value for the service process and finally for the client. The post-audit report also allows collecting valuable training materials for the hotel staff. They receive a highly valuable feedback about their work being, at the same time, aware of their advantages and areas in need of improvement. An overall analysis of the report resulting from the Mystery Shopper audit focused on detecting threats occurring in an organization allows for developing solutions and recommendations for the actions aimed at the improvement of provided services level, higher customer satisfaction and enhanced operational efficiency.

5. Mystery Shopper audit

The carried out research project focused on analyzing the actual level of services offered in hospitality facilities on the territory of Poland, however, with particular emphasis on the areas recognized as attractive for tourist traffic. The audits were held in the years 2013-2015, mainly in coastal regions and in southern Poland. The study covered thirty-eight accommodation facilities of various types and categories, which included as follows:

- one 5-star hotel,
- six 4-star hotels,
- two 3-star hotels,
- one 3-star guesthouse,
- four 2-star hotels,
- twenty-two uncategorized objects (including one awaiting 4-star categorization),
- one facility using 3-star rating illegally (contrary to the Act).

These objects were characterized by a longer stay as the dominating one and typical for weekend and holiday visits. The audits were partly requested by the facility management and partly by the contractors, who filed complaints about the offered standard and service quality. The purpose of the study was to identify the level of services, which predominantly constitute the basic service offer of a given facility:

- accommodation services (hotel's residential part and its environment),
- food and beverage services (offered meals),
- Spa & Wellness facilities (sauna zone, swimming pool, treatment rooms, etc.).

The study was performed by visiting and auditing the selected facilities, in the course of which the auditor was staying as a potential client and using the offered services. The auditor was a professionally experienced person, with extensive experience in the hotel industry, which allowed thorough data

collection and in-depth analysis of the observed results. The study was carried out in accordance with the defined and repetitive scenario, whereas the results were gathered and reported in the questionnaire prepared specifically for this purpose. Due to the fact that in each audited object one measurement was performed a uniform scenario model was applied, which differed depending on the region and the facility type, however, in order to maintain a real life situation the auditor's individual preferences were taken into account in the course of the discussed visits.

As a result of conducted audits the sets of partial results from the particular analyzed service areas were obtained, which were later analyzed to give the below-presented results. Having taken into account that in case of audits carried out in hotel chains and performed in accordance with ISO 9001 standard a three- or four-level scale of evaluation results is applied, a four level one was used in this case, which in the author's opinion happens to be more appropriate in the context of audited objects, especially the uncategorized ones. Therefore the conducted audit results were subject to a four-level scale of evaluation:

- 0 – 49% compliance – poor results indicating gross incompliance,
- 50 – 69% compliance – poor result, to be corrected,
- 70 – 89% compliance – good, acceptable result,
- 90 – 100% compliance – very good, desirable result.

The distribution of final evaluations from all conducted audits was from 31.50% up to 81.55% of the level service correctness, with median value reaching 63.25%.

The figure 1 below presents the detailed observation results.

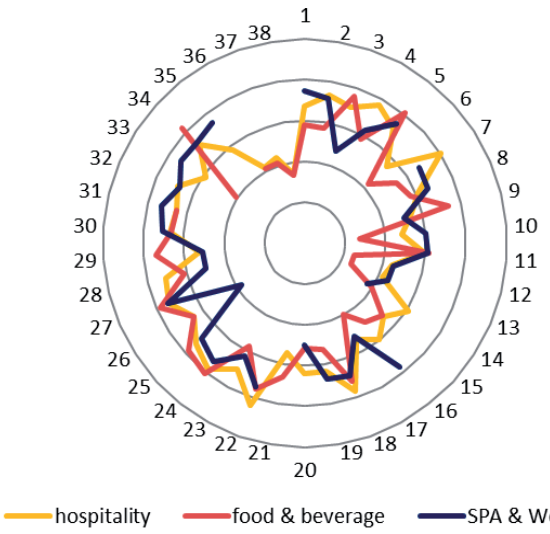

Figure 1. Distribution of observation results in particular hotel facilities

Due to the fact that the audit assumption was to measure the provided services in three selected areas:

- accommodation services (hotel's residential part and its environment),
- food and beverage services (offered meals),
- Spa & Wellness facilities (sauna zone, swimming pool, treatment rooms, etc.), the focus was on the analysis of the relevant data.

Based on the nature and specificity of the study in presenting its results, the authors used quartiles as the most frequently applied trend measures in illustrating data concentration around the analyzed feature.

Table 1. The analysis of results in particular service areas

Services	median	highest value	lowest value	first quartile Q1	second quartile Q2	third quartile Q3
hospitality	63.73%	83.88%	34.25%	54.13%	63.73%	71.23%
food and beverage	57.63%	82.76%	25.00%	42.32%	57.63%	72.13%
Spa & Wellness	67.44%	76.91%	36.70%	50.82%	67.44%	73.44%

Table 2. The analysis of final audit results

Evaluation	median	highest value	lowest value	first quartile Q1	second quartile Q2	third quartile Q3
final audit evaluation	63.25%	81.55%	31.50%	54.59%	63.25%	70.86%

The value of the third quartile amounts to 70.86%, calculated for the final audit results. It can be concluded that 75% of the audited objects achieved a good, acceptable result. Only 25% of the audited hospitality facilities presented the level of 70.87%, however, having taken into account that the highest value reached 81.55%, the respective facility is ranked as: acceptable.

The median of results at the level of 63.25% compliance shows clearly that the quality of service processes has to be definitely improved.

The obtained evaluation results indicate as follows:

- higher evaluation in the area of hospitality services mainly results from the general impression made by the facility and its lobby and primarily their functionality, aesthetics and equipment standard,
- the facilities presenting modern interior design and newly furnished are simultaneously insufficiently clean and neglected,
- the most significant quality shortcomings refer to the level of maintaining room or common areas (including toilets) cleanliness and permanent technical defects,
- the absence of standards and work procedures or lack of compliance and supervision over them,

- in the area of food and beverage services the standards and rules of waitressing service area are not observed,
- significant negligence in terms of maintaining cleanliness level of tableware and table linen as well as accessories and equipment,
- commonly encountered a lack of disinfection and hygiene in the area of wellness services,
- no sense of privacy during Spa & Wellness treatment,
- shortening the duration of Spa & Wellness sessions.

The conducted audits illustrated that all service provision areas need corrective measures to be undertaken – especially in:

- work technique and service standards improvement,
- implementation of fundamental customer service rules,
- observing hygiene and maintaining cleanliness standards,
- moreover, so their implementation should start as soon as possible.

6. Final remarks and conclusions

The functioning of hospitality facilities is based on market orientation, i.e. the desire to serve the largest number of guests at the highest possible price. The increasing competitiveness forces the provision of services at the highest possible level. The audited facilities face the challenge of the rendered services improvement, predominantly in these areas which are crucial for the hotel success, i.e. cleanliness, service quality and staff attitude, especially that these particular areas received the worst evaluations. Furthermore, the conducted research illustrated that the number of stars does not guarantee high service level. The aforementioned Act on tourist services, based on which standardization is performed, imposes minimum requirements only and primarily in terms of equipment, technical standards and the range of services. It, however, does not define the standards of service oriented processes as well as attitudes and behaviors presented by employees, which remain the crucial factors facilitating recognition on the hospitality market earned owing to the high quality of provided services.

The research results show that 4-star hotels received assessments ranging from 81.55% down to 57.58%. On the other hand. the highest assessment among the uncategorized facilities amounts to 77.13%. The lowest result (31.50%) was achieved by the standardized 3-star guesthouse. Thus. it is not the standardization expressed by the number of stars. but the standardization of service procedures and predominantly the attitude and behavior of staff, as the non-material service oriented factors, determine the overall quality.

Given the above, the implementation of corrective processes focused on changing the level of provided services should be initiated and begin with:

- organizing professional trainings (to upgrade staff qualifications), e.g.: for **housekeeping** employees: techniques and rules in cleaning rooms and common areas, work standards, guests service, for **food and beverage** and also **front desk staff**: professional service provided to an individual and group guest, effective sale of food and beverage services, communication and cooperation with an external client,
- introducing work standards and management standards based on codified procedures and analytical tools,
- implementing work standards and procedures increasing the quality of services and their delivery,
- developing and implementing effective tools and systems for work quality control,
- developing and implementing effective motivation systems in all departments, e.g.: based on quantity factors (sales volume, average invoice value) and quality factors (team cooperation, upgrading vocational qualifications),
- creating proper organizational culture and HRM standards.

The implementation of the above-listed activities should result in better work quality and improve the existing situation in the audited facilities. Moreover, it will not only result in a better future evaluation of the audited areas up to the desirable minimum of 90% compliance but primarily improve the effectiveness of operational activities, enhance hotel competitiveness and in terms of hospitality service result in higher customer satisfaction and thus their loyalty.

References

Blikle, A. J. (2014). *Doktryna jakości, rzecz o skutecznym zarządzaniu.* Gliwice: Wydawnictwo Helion.

Głodkowski, O., & Malinowski, B. (2010). *Poradnik – krok po kroku jak wdrożyć system zarządzania procesami wg ISO 9001 i uniknąć najczęstszych błędów*. Warszawa: Warszawska Szkoła Zarządzania.

Grelowski, M. (2007). Rola menadżera. *Hospitality – Kwartalnik Menedżerów Hotelarstwa,* 2. Warszawa: Instytut Rynku Hotelarskiego.

Grzesiak, M. (2006). Najlepszy pracownik, *Hospitality – Kwartalnik Menedżerów Hotelarstwa,* 2. Warszawa: Instytut Rynku Hotelarskiego.

Hotelarz (2008), 10(549). Warszawa: ProMedia Sp. z o.o.

Jurek, P. (2012). Zarządzanie kompetencjami zawodowymi pracowników w nowoczesnych organizacjach. *Psychologia zarządzania w organizacji.* Warszawa: PWN.

Kosmarzewska, J. (2012). Gościnność jako istotna składowa reputacji gospodarstwa agroturystycznego. *International Journal of Management and Economics*, 35. Warszawa: Szkoła Główna Handlowa.

Lashley, C. (2008). Marketing hospitality and tourism experiences. In A. Pizan (Eds.), *Handbook of Hospitality Marketing Management.* Oxford, United Kingdom: Elsevier.
Marciniak, J. (2010). *Audyt funkcji personalnej w przedsiębiorstwie.* Warszawa: Oficyna Wolters Kluwer.
Morawski, M. (2009). *Zarządzanie profesjonalistami.* Warszawa: PWE.
Stor, M. (2012). *Kontynentalne ramy efektywności i skuteczności ZZL w przedsiębiorstwach międzynarodowych – perspektywa europejska, amerykańska, azjatycka i afrykańska. HRM Zarządzanie Zasobami ludzkimi*. Warszawa: IPiSS.
Tokarz, A. (2008). *Zarządzanie zasobami ludzkimi w sektorze turystycznym.* Warszawa: Difin.
Witkowski, Cz. & Kachniewska, M. (2005). *Hotelarstwo część III. Hotelarstwo w gospodarce turystycznej.* Warszawa: Wyższa Szkoła Ekonomiczna.

Internet sources

http://www.hotelinfo24.pl/index.php?id=cytat

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WHY METALLICA CHANGED MUSIC WORLD. EFFECTUATION PERSPECTIVE

***Erno Salmela*[1]**

Abstract
The purpose of this article is to understand the underlying factors why Metallica was capable of creating radical changes in the music industry and conquering the world. Metallica´s history is examined during the period of 1981-1991 when Metallica advanced from a garage band into one of the world's biggest bands. Metallica also played a remarkable role in the generation of new thrash metal genre. The effectuation theory is utilized in analyzing how this happened. This study provides knowledge on what is needed in creating this kind of success and progress. Prior to this, the effectuation theory has not been connected to the operations of any band or even other artists.
Keywords: *effectuation, entrepreneurship, Metallica, effectual logic, market creation, renewal, thrash metal, music industry, heavy metal.*

1. Introduction

When starting Metallica, the primary goal of its founders, Lars Ulrich and James Hetfield, was learned to play, build a band, play to an audience, and make their first own song and album. They did not dream of becoming rock stars (Brannigan & Winwood, 2013a). At the beginning of the 1980s, Metallica stood out clearly from glam metal, which was the heavy metal phenomenon of that time in the US. Whereas Mötley Crue and other similar bands put on makeup, dressed colorfully and enjoyed the status of being rock stars, the members of Metallica looked ragged and modest (Halfin, Hammett & Uet, 2010; McIver, 2009). To many, Metallica's appearance was as disgusting as their music. However, Ulrich and Hetfield believed in what they were doing and took it forward with passion. In 1986, five years after starting the band, they still earned only $30 a day. At the time, it was enough to live on and got to do what they loved. During 1987-1988, the situation began to change rapidly. Their efforts began to show also as property (Brannigan & Winwood, 2013a).

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Nowadays, Metallica is one of the most commercially successful bands of all time, with estimated sales of almost 93 million albums worldwide (Metallica Album Sales Statistics, 2016). Metallica also created a new music genre of thrash metal (Brannigan & Winwood, 2013a; McIver, 2009). The band culminated in the *Black* album released in 1991, ten years after the band was founded. Today, the *Black* has sold about 23 million copies (Metallica Album Sales Statistics, 2016; Brannigan & Winwood, 2013b). The *Black* was Metallica´s artistic and financial highlight after which Metallica lost its best creative capability (Brannigan & Winwood, 2013a,b; McIver, 2009).

The first research objective is to analyze why Metallica was capable of creating radical changes in the music industry during the period 1981-1991. Besides Metallica, some other bands from different genres have same kind of achievements. Studying those bands would be as valuable as studying Metallica. However, this research was restricted to one case to focus on it profoundly.

Entrepreneurial behavior has played an important role in Metallica´s history. New market creation, renewal of band and growth are good indications about that. The band´s success has especially been based on a duo of Ulrich and Hetfield who acted in accordance with their values and identities (Brannigan & Winwood, 2013a; Wall, 2011). Sarasvathy (2009), Sveningsson and Alvesson (2003) and Leppänen (2013) emphasize the role of identity in entrepreneurship. Furthermore, Ulrich and Hetfield were able to build a network around them, which was crucial to their success (McIver, 2009). Networking is seen one of the most important success factors in entrepreneurship (Furr and Dyer, 2014; Sarasvathy, 2009; Sims, 2011). Metallica´s courageous seizing of opportunities, dedication, determination, and hard work enabled the creation of one of the most famous success stories of the music world (Wall, 2011; McIver, 2009). These characteristics are often connected to entrepreneurship (e.g. Sims, 2013; Sarasvathy, 2009; Leppänen, 2013; McGrath & MacMillan, 2000).

Ulrich and Hetfield were trial-and-error-orientated (Berlinger & Sinofsky, 2014; Brannigan & Winwood, 2013a). Ries (2011) and Sarasvathy (2009) write that entrepreneurs create new things under the uncertainty. Planning in advance does not work in the environment of uncertainty, but do experiments and learning from them is more crucial (Furr & Dyer, 2014; Sims, 20011). Ulrich and Hetfield did not follow the trends of the music industry and predicted the future, but they created with their preferences and actions an environment they liked (Brannigan & Winwood, 2013a). Finally, Metallica created a new music genre of thrash metal by combining earlier music genres (Brannigan & Winwood, 2013a; McIver, 2009). According to Schumpeter

(1976), entrepreneurship results in new industries and products by connecting existing things.

Making money was not the primary concern of Ulrich and Hetfield at the beginning of their career (Brannigan & Winwood, 2013a). That is why the entrepreneurial mindset (e.g. McGrath and MacMillan 2002) describes better Metallica´s behavior than more monetary-oriented entrepreneurship concepts. According to Financial Times Lexicon (2016), the entrepreneurial mindset refers to a specific state of mind which orientates human conduct towards entrepreneurial activities and outcomes. Individuals with entrepreneurial mindsets are often drawn to opportunities, innovation, and new value creation.

Entrepreneurial behavior can be approached from different perspectives. Through theoretical mapping two promising theoretical frameworks were found to analyze Metallica case: *bootstrapping* (Bhide, 1992; Christiansen & Porter, 2009) and *effectuation* (Sarasvathy, 2001). These approaches have many similarities but also some differences. Effectuation was chosen as a theoretical framework for this study because it focused more on human and social capital than bootstrapping that emphasizes more on the financial aspect. The story of Metallica is above all a story about human and social assets. Second reason for selecting effectuation was its emphasis on new market creation. In bootstrapping, the emphasis is on developing products that target market actually wants and likes (Rojas, 2010). Metallica did not penetrate to current market but created a new market and changed consumer behavior.

The effectuation has been studied in start-ups and matured companies in several fields such as health care, biotechnology, winemaking, and cosmetics (Effectuation website, 2016). Case study seems to be a dominant research method in studies of effectuation. So far, the creation of new bands and their markets has not been examined scientifically or practically from the viewpoint of effectuation. In fact, it seems that effectuation has not been studied in any area of art. This is surprising because many artists are entrepreneurs. On the other hand, artists also have problems to make money with their art. This possibly results from a lack of their entrepreneurial mindset (Lepore, 2015).

Related to first research objective, the following working hypothesis was set: Metallica´s capability of creating radical changes in the music industry and conquering the world may result from their effectual activity. The second research objective is to find out how the effectuation theory applies to the music band and above all to an art context.

The article proceeds so that the next chapter presents the effectuation, after which Chapter 3 describes the case of Metallica. In Chapter 4, the case is analyzed with the help of the effectual logic. Chapter 5 discusses the results of the research. The article is concluded by the summary and needs for further research.

2. Effectuation

Effectual logic/entrepreneurial thinking is especially suited for creating new when the future is difficult to predict. In this case, the goal or outcome is uncertain. Effectual logic starts with the available means and resources, which can be used to create a new product or a company as well as new markets. Vice versa, *causal logic/managerial thinking* is suitable for such situations where there is a clear goal which is aimed at finding the best available means. The causal logic begins with the impact we wish to make. The differences between effectual and causal logic are presented in Figure 1. The differences can also describe from the viewpoint of controlling:

- Effectual logic: The more you can control the future, the less you have to predict it.
- Causal logic: The more you can predict the future, the more you can control it (Sarasvathy, 2001; 2009)

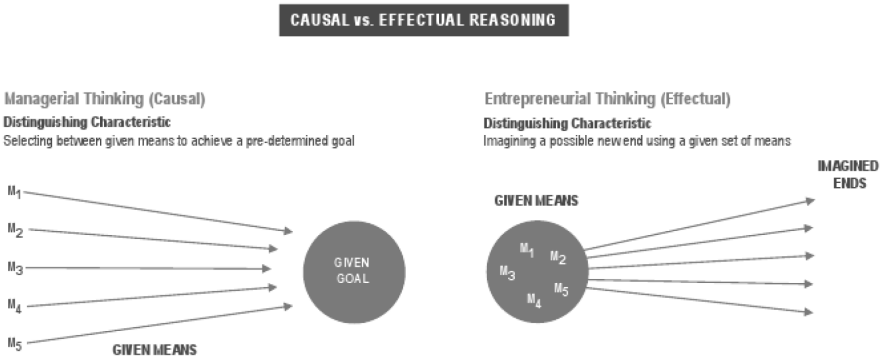

Figure 1. The difference between effectual and causal logic

Source: Effectuation website (2014).

2.1 Innovation matrix and suicide quadrant

Means-based effectual logic indicates higher growth potential than causal logic (Nienhuis, 2010). The use of effectual logic is especially suitable for the start-up phase of an organization or innovation. Entrepreneurs utilize this logic especially in the so-called suicide quadrant of innovation, where a new product is created for new markets (Figure 2). In fact, entrepreneurs do not see this as a suicide quadrant, but as a possibility to create new business operations by controlling the unpredictable future of their own activities. They see uncertainty as an opportunity (Sarasvathy, 2009).

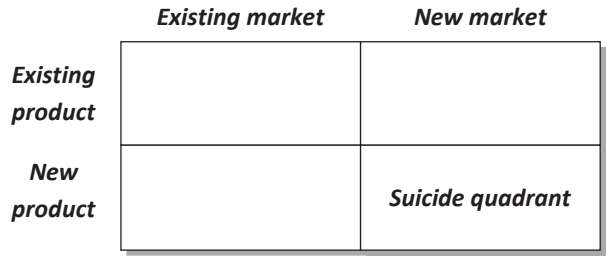

Figure 2. Innovation matrix and the suicide quadrant

Source: Sarasvathy (2009).

Effectual problem space

Entrepreneurs face uncertainty on three levels, which form the effectual problem space (Sarasvathy, 2009):

1) *Knightian uncertainty:* It is impossible to measure the probability of results from actions that are carried out. In effectual logic, probabilities are not considered as given constants.
2) *Ambiguity of goals:* The goals and preferences of entrepreneurs are not entirely clear. In effectual logic, goals and preferences may change along the way.
3) *Isotropy:* Uncertainty of where attention should and should not be paid in an environment – what information is relevant and what is not. In effectual logic, the environment is not taken as something given that must be adjusted to, but it is possible to impact the environment

Due to the uncertainties, action and experimenting are more important matters than planning in effectual logic. Effectual actors inevitably face failures along the way. They are an integral part of the journey. Learning from the failures and keeping them small is crucial. On the other hand, small successes recurring are important in creating something new (Sarasvathy, 2001; 2009).

Principles of effectuation consists of (Sarasvathy, 2009):

1) *Bird-in-hand:* When entrepreneurs set out to build a new venture, they start with their means: who I am, what I know, and whom I know.
2) *Affordable-loss:* Entrepreneurs limit risk by understanding what they can afford to lose at each step, instead of seeking large all-or-nothing opportunities.
3) *Crazy/patchwork-guilt:* Entrepreneurs build partnerships with self-selecting stakeholders. By obtaining pre-commitments from these

key partners early on in the venture, they reduce uncertainty and co-create the new market with its interested participants.

4) *Lemonade:* Entrepreneurs invite the surprise factor. Instead of making "what-if" scenarios to deal with worst-case scenarios, they interpret bad news and surprises as potential clues to create new.
5) *Pilot-in-the-plane:* By focusing on activities within their control, entrepreneurs know their actions will result in the desired outcomes. An effectual worldview is rooted in the belief that the future is neither found nor predicted, but rather made.

Dynamic process model of effectuation

Effectuation is not a static, one-time exercise. It is a logic and process that can be used as the organization develops in the early start-up phase of growth. The dynamic process model of effectuation (Figure 3) includes the following phases (Sarasvathy, 2009):

1) The entrepreneur owns the means, i.e. who I am (identity), what I know/can do (human capital) as well as whom I know and what can they do (social capital).
2) Focus is on what it is possible to do and aspire to – i.e. what can be influenced by one's own actions. Focus is not primarily on what should be done.
3) Some of the people involved in the interaction are committed to the idea and the company. Partners can be, for instance, potential customers.
4) Each commitment, activity, and experiment results in new means and goals for the company. Each cycle shapes the idea, the company, and the markets.
5) Due to the growing network, restrictions begin to increase. Restrictions limit the possibilities to change the goals. Thus, restrictions also define who will be included in the network.
6) Changes in the environment offer new means, but also create restrictions.

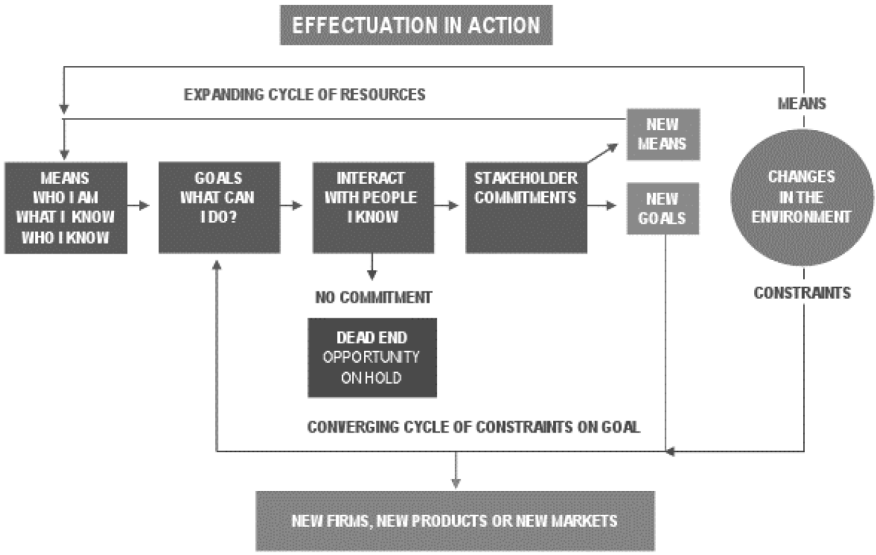

Figure 3. Dynamic process model of effectuation
Source: Sarasvathy (2009).

3. Description of case Metallica

Metallica´s capability of creating radical changes in the music industry and conquering the world are related to entrepreneurial behavior, new market creation, and renewal and growth of the band. In consequence, gathering of research data about Metallica focused on these elements. Research data was collected from existent documentary material about Metallica. Data was gathered as long as saturation point was achieved. The following case description is based on this data.

3.1 Ulrich and Hetfield – Founders of Metallica

Let us look first at the backgrounds of Ulrich and Hetfield, since Metallica´s success is based especially on their dreams and personalities. Ulrich wanted to create the world's biggest band, and Hetfield pursued to get rich by making music. In the beginning, these were only distant dreams. Ulrich and Hetfield did not establish exact goals or plans, such as making music in a specific genre, in order to achieve their dreams (Brannigan & Winwood, 2013a). They played and composed the kind of music they liked and were capable to play. On the other hand, they were ambitious and wanted to differ from the others

musically by making new kind of music that didn't yet exist in the world (Brannigan & Winwood, 2013a; McIver, 2009). However, no one could have predicted that Metallica would make the kind of music they did in the *Black* album, which would make the dreams of Ulrich and Hetfield come true. Their goals were sharpened along the way, and preferences related to music style were transformed (Brannigan & Winwood, 2013a; 2013b).

Ulrich and Hetfield were very strong and stubborn personalities, who have also been called control freaks. The reigns were then tightly in their hands. They always had the last word in decisions. There was no room for compromises (Brannigan & Winwood, 2013a; McIver, 2009). On the other hand, they were different kinds of people. Hetfield was good at composing music and charismatic on the stage, while Ulrich excels networking and creating relationships (Eglinton, 2010; Halfin et al., 2010). They knew how to utilize each other's strengths and complete weaknesses (Brannigan & Winwood, 2013a; Wall, 2011).

During the early days, the members of Metallica´s members had nothing to lose. Music was a way of life for them (McIver and Hammett, 2011; McIver, 2009). For Hetfield, music even meant so much that he believed it had saved him from either death or jail (Berlinger & Sinofsky, 2014, Eglinton, 2010). At first, they did not think about any possible profits. It was enough for them to get to play and be able to buy food and drinks. The dream of getting rich and creating the world's biggest band was still far away, and they did not think about it in their daily lives (Brannigan & Winwood, 2013a).

New thrash metal genre

At the beginning of the 1980s, glam metal was big in the US, and many record labels stood behind it. However, the Metallica was determined to take their endeavor to another direction. Metallica offered a new alternative to the hidden needs of the music audience (Brannigan & Winwood, 2013a; McIver, 2009). Most people did not believe in Metallica and its music. The band got its energy and confidence from enthusiastic underground fans during gigs. For Metallica, the full support of a small fan group revealed they were on the right path. Metallica even moved from Los Angeles to San Francisco, where the audience was considerably more tolerant with regard to experimental music. In San Francisco, they also found other thrash bands, with whom it was easier to build a new music scene. Metallica did not adjust to the prevailing general environment but started to change the prevailing state of music and consumers´ preferences for their activities (Wall, 2011; McIver, 2009).

Although Metallica was not specifically restricted to certain music genres, the music and attitude of the band greatly influenced the creation of the thrash metal genre. When *Kill'em All* debut album was released in 1983; it

created the standards for thrash metal (Wall, 2011; McIver, 2009). The band got influences especially from the New Wave of British Heavy Metal (e.g., Diamond Head and Iron Maiden), Motörhead and the nihilistic American punk. Combining these genres was essential in the creation of thrash metal (Brannigan & Winwood, 2013a). Metallica found its own style through experiments, the most important of which were their numerous gigs. At first, the band played its songs slower but gradually the tempo increased (Brannigan & Winwood, 2013a; McIver, 2009).

Renewal of music, band and network

Metallica differed considerably from typical heavy metal bands due to their wide taste in music – from Ennio Morricone to Simon & Garfunkel (Brannigan & Winwood, 2013a). This was a reason why Metallica renewed its music for every new album. Maybe the most significant change occurred after the album *...And Justice for All* when Metallica tired of complex song structures. For the *Black* album, the songs were considerably simplified and simultaneously the tempo was slowed down. In 10 years, the thrash metal band transformed as a hard rock band. The Black album was their real breakthrough into the mainstream (Brannigan & Winwood, 2013a; McIver,2009).

Networking played an important role in Metallica's renewal and rise to the top. Especially Ulrich created networks effectively. This way Metallica found suitable musicians, managers, record labels, and producers. In the beginning, the band members' friends were committed in Metallica, but Metallica networked with anyone. In this context, we cannot belittle the significance of the "social media" of the 1980s. Fanzines and trading cassettes played an important role in creating networks and spreading the word over the US and the world (Brannigan & Winwood, 2013a; McIver, 2009).

After a few early bad choices regarding band members, Ulrich and Hetfield started to pay more attention to their choices in musicians and partners. New arrivals were often put to a hard mental and physical test in order to prove their abilities and suitability to Metallica. For instance, the bass player Jason Newstedt and the producer Bob Rock got to experience this first-hand. Ulrich and Hetfield did not trust talks and promises. In their opinion, only actions revealed the true state of matters. In this way, they were able to effectively get rid of opportunists and retards (Brannigan & Winwood, 2013a; 2013b; McIver & Hammet, 2011).

Metallica had a core, an inner and an outer circle of people. The core of the band was formed by Ulrich and Hetfield. The first inner circle is formed by the bass player and second guitar player (Berlinger & Sinofsky, 2014; Brannigan & Winwood, 2013a; McIver, 2009). Also, Bob Rock, who produced the *Black*, reached the first inner circle or even the core of the Metallica. When

composing, Metallica did not listen to outside people's advice before Bob Rock (Berlinger & Sinofsky, 2014; Brannigan & Winwood, 2013b). The second inner circle is formed by managers and record label representatives. The press and fans can be thought to form the outer circle. The inner and outer circles were constantly changing. Each new album release and tour meant some change in the network. The network offered new means for making better albums, tours, and marketing (Brannigan & Winwood, 2013a).

Courageous grabbing coincidences and opportunities separated Metallica from many other bands. Especially Ulrich was strong in this area. A good example of this is when Ulrich reserved a spot for a song in the *Metal Massacre* collection even before he had a band or any song. With regard to creating Metallica, this was a very significant event since it offered Ulrich an opportunity to work together with Hetfield (Brannigan & Winwood, 2013a; McIver, 2009).

Metallica also faced numerous failures. Especially, commercial experiments made against Metallica's instinct usually failed. Examples of these are the song "Escape" in the *Ride the Lightning* album and choosing the producer of the hit album *Appetite for Destruction* by Guns 'n' Roses to produce the album *...And Justice for All*. On the other hand, without experiments, Metallica would not have developed to the mega band. The audience liked Metallica's changes during the period 1981-1991, and sales grew in leaps (Brannigan & Winwood, 2013a). Some of the early thrash metal fans disappeared, but they were multiplied by the new audience (McIver, 2009).

Metallica´s growth

In early days, Metallica did not have the money to release albums or go on extensive tours, so the band inevitably needed external resources (Brannigan & Winwood, 2013a). Their first manager, Jon Zazula, found Metallica via their ´s *No. Life 'til Leather* demo (McIver, 2009). Zazula saw so much potential in Metallica that borrowed money to cover the recording budget of debut *Kill´em all*. A few years later he had to step down when a larger caliber manager stepped in. Metallica made this decision because they saw it as a crucial step in securing the band's growth (Brannigan & Winwood, 2013a).

Indicative of the band's commercial growth is that in its release year 1983, *Kill'em All* sold a few tens of thousands of copies. Eight years later the *Black* sold 650,000 copies in the US during the first week. Today it has sold about 23 million copies globally (Brannigan & Winwood, 2013a; Metallica Album Sales Statistics, 2016). The budget for making the *Kill'em All* debut album was $15,000 and making it took only a couple of weeks in the studio.

The budget of the *Black* was $1 million, and the band was at the studio nine months (Brannigan & Winwood, 2013a).

At the beginning of Metallica's career, neither the band nor anyone else could predict, how much the forthcoming album would sell and how much audience would be on the tour. Thus, consequences of the actions could only be seen in the real world (Brannigan & Winwood, 2013a; McIver, 2009). Only after Metallica's third album, *Master of Puppets* released in 1986, the audience numbers started to increase considerably. During this time, also music magazines, managers, and record labels started to become interested in the band. At this time, the resources of Metallica reached a professional level (Brannigan & Winwood, 2013a; Halfin et al., 2010; McIver, 2009).

Gradually, the band built its global Metallica market, so-called Metallica family. The Metallica machine advanced so adamantly that it was as if there had been some strategic master plan guiding it. However, this was not the case but hard work and living in the moment (Brannigan & Winwood, 2013a, b; McIver, 2009). Nowadays, Metallica is one of the most commercially successful bands of all time, with estimated sales of almost 93 million albums worldwide (Metallica Album Sales Statistics, 2016). Global sales of Metallica albums are presented in Table 1 (live/cover albums are not included). Metallica has ranked at place 22 on top selling artist ever. In comparison, The Beatles is number 1, and it has sold almost 270 million albums (List of best-selling music artists, 2016).

Table 1. Global sales quantity of Metallica albums

Period of 1981-1991 examined in this study

Kill 'Em All	**1983**	**5,500,000**
Ride the Lightning	**1984**	**7,125,000**
Master of Puppets	**1986**	**7,750,000**
...And Justice for All	**1988**	**9,000,000**
Black/Metallica	**1991**	**23,000,000**
Load	1996	8,500,000
Reload	1997	7,000,000
St. Anger	2003	4,250,000
Death Magnetic	2008	2,250,000

Thrash metal

Change in Metallica´s music genre

Hard rock

Source: Metallica Album Sales Statistics (2016).

Metallica´s album and tour cycle

During the first ten years, Metallica had seven significant releases: "Hit the lights" song in the *Metal Massacre* collection, *No. life 'til Leather* demo – and the following albums: *Kill'em all*, *Ride the Lightning*, *Master of Puppets*,

...And Justice for All, and *Black* (Brannigan & Winwood, 2013a; McIver, 2009). Metallica had quite a similar cycle for each of these releases.

The band members, especially Hetfield, developed riffs independently and recorded them on tapes during the tour following the release of the album. After the tour, Hetfield and Ulrich listened to the tapes and began to develop the riffs further as well as combine them. After this, the band made demos of a few songs and experimented them on insiders and sometimes at gigs. The songs were improved based on the feedback and feelings from people. During the demo phase of the album, also the guidelines, i.e. what sort of an album they wished to make, began to take shape (Brannigan & Winwood, 2013a; Eglinton, 2010).

After this Metallica began the search for a suitable studio, sound engineer, and producer, if they did not believe that the partners of the previous album would achieve the desired outcome. Also, the record label, manager, and band members could change at this phase. In practice, for each album some person changes occurred. In the early releases, the changes were more extensive than later on. Depending on the partner, the commitment meant a different investment of resources to the band. When the newly committed partners were gathered, a studio period for recordings was booked. At that point, also a target schedule was set for the release of the new album. Making the songs continued at the same time as the network took shape and the studio period came closer. Usually, Metallica's songs were quite ready by the time they went to the studio. A notable exception was the *Black* album, for which they spent considerably more time in the studio than before (Brannigan & Winwood, 2013a; Wall, 2011; McIver, 2009).

After recording an album, the band started a new tour which simultaneously also kicked off a next album composing cycle. Each cycle produced a new album, new fans, and new partners for Metallica. Notable musical development occurred between the different albums, although they were released quite frequently in the beginning (Brannigan & Winwood, 2013a). Metallica´s musical preferences changed between the release cycles. New band members and other partners made possible to develop music, tour, and marketing to a new level. For example, with a new record label and manager marketing of the albums improved and the tours became bigger (Brannigan & Winwood, 2013a; McIver, 2009).

4. Mettallica as effectual actor

This chapter analyses the first ten years of Metallica with the help of the effectuation framework. Like all entrepreneurship stories, also the Metallica possesses characteristics of causal logic. However, the focus is not on

causation in the following analysis. The purpose is not to belittle causal logic since without causal activities, Metallica would not have become the mega band it is today. Metallica and its partners utilized causation during every album release cycle. Without planning and goal-orientation, albums and tours would not have been succeeded. It seems that Metallica´s partners had more important role in causation activities while the band itself focused more on creating new by operating effectually.

Metallica case related to the philosophy of effectuation

- The more you can control the future, the less you have to predict it: Metallica did not predict but made suitable future for it by controlling the change. Metallica founders have been even said to be control freaks.
- Instead of specific goals, the starting point is are the available means – one's own identity as well as human and social capital: Metallica founders recognized their own strengths as means to create together something new. Furthermore, they utilized successfully social networks.
- Instead of following trends, the focus was on own actions: Metallica proceeded against trends (e.g. glam metal and music videos) and trusted their own dreams and actions.

Metallica case related to innovation matrix

In the innovation matrix, Metallica operated in the suicide quadrant by creating new product/band and new market/musical genre. Effectual logic is especially suited for the suicide quadrant at an early phase of an organization/ team or innovation.

Metallica case related to effectual problem space

- *Knightian uncertainty:* At the beginning of Metallica's career, neither the band nor anyone else could predict the consequences of their actions – for instance, how much the following album would sell and how much audience the tour would have.
- *Ambiguity of goals:* The goals of Metallica were not concrete – for instance, with what type of music their dreams would be achieved. The goals were sharpened along the way, and preferences related to music style were transformed.
- *Isotropy:* Metallica got its energy and confidence from enthusiastic underground fans during gigs. The intense support of a small fan group was relevant information for Metallica. It revealed that the band was on the right path.

Metallica case related to principles of effectuation

- *Bird-in-hand:* Means were more important for Metallica than the goal. The most important thing was to make the kind of music they liked and were able to make. They knew what they were good at and utilized their own strengths. The focus was just on doing things as good as possible – at least when measured on a rock band scale.
- *Affordable-loss:* During the early years of Metallica, the members of Metallica had nothing to lose. Music was a way of life for them. On the other hand, the first manager´s investment in the band was not a small thing. He invested to Metallica everything he owned – against to the principle of affordable-loss.
- *Lemonade:* Courageous grabbing coincidences and opportunities separated Metallica from many other bands.
- *Crazy quilt principle:* Open minded networking played an important role in Metallica's rise to the top. Metallica found suitable musicians, managers, record labels, producers, etc. with the help of active networking.
- *Pilot-in-the-plane principle:* Metallica holds the reigns tightly in its hands. The band often had the last word in critical decisions. Metallica did what it wanted to without listening to others. There was no room for compromises.

Metallica case related to dynamic process model of effectuation

During 1981-1991 for each new album or another release, a new network and resources were built around Metallica, as a result of which new means and goals were created for the band. Metallica had quite a similar cycle for each of their album release and tour. A notable exception was the *Black* album, for which they spent considerably more time in the studio than before. Metallica also decided to simplify and slow down their music in *Black*. Furthermore, the band listened to a producer much more than before. This resulted in a commercial masterpiece. Dynamic effectuation process was remarkable to Metallica because continuous and ambitious renewal was important for the band.

5. Discussion

The *first objective* of the research was to explain Metallica's success in the music industry. Working hypothesis was that success results from the effectual activity of Metallica founders. The research revealed that effectual actions played an essential role during the Metallica's first decade when its biggest development leaps happened. The following elements of the effectuation theory were utilized in analyzing Metallica´s success: the innovation matrix,

the effectual problem space, the principles of effectuation, and the dynamic process model of effectuation.

Firstly, Metallica mainly acted in the suicide quadrant on innovation matrix by creating a new product (new band and music) and markets (new thrash metal genre). Most of the bands are exploiters who compose their own music by slightly shaping music made earlier by others. Metallica took lessons from other bands, as well, but it was able to combine different genres seamlessly in a more innovative manner than average bands. *Secondly,* Metallica had all three types of uncertainties in an effectual problem space. The band´s strength was to transform uncertainties to opportunities and utilize opportunities. *Thirdly*, Metallica utilized all the principles of effectuation effectively. The principle of pilot-in-the-plane was extremely strong within Metallica. Metallica´s core persons kept major decisions strictly in their own hands. They did what they wanted – not what they were told or expected to. The principle of affordable-loss was not so important than other principles. In fact, Metallica had nothing to lose at the beginning of the career. *Fourthly,* a dynamic process model of effectuation played an important role for Metallica because of its renewal will. This may be a fundamental factor why Metallica succeeded in changing music world – "a rolling stone gathers no moss".

The *second objective* of the research was to illustrate effectuation theory in a band and art context, which has not been done before. On the basis of empirical research, the effectuation theory helped in analyzing and revealing Metallica´s success factors. Money is often strongly connected to entrepreneurship, but effectuation theory does not emphasize money. Therefore, it can be applied to explain success factors of intrapreneurship. Metallica story in this article was also primarily an intrapreneurship case, in which entrepreneurial mindset was more crucial than money.

The study have the following limitations: 1) No. explicit measures that indicate causal connection between the effectual activity and Metallica´s success, 2) No. knowledge about relationship of effectual and causal logic in Metallica case, 3) Because of one case study, the results cannot be generalized to other bands that have created new kind of music and new market, 4) Metallica band´s partners were not profoundly analyzed, how effectual or casual they were, and 5) Critics towards effectuation have not been considered.

Practical implications – What young bands and other artists could learn from Metallica?

In the 1980s, many other rock bands worked with the cycle typical to Metallica – created riffs, built songs from riffs, made demos, recorded and released an album and went on tour. But what separated Metallica from most of the other bands? Was Metallica more effectual than average bands? *Firstly,*

Metallica was not satisfied with reinventing the wheel. It had a desire to make different kind of music, in which talent and a wide taste in music helped. Where the influences of Metallica's debut album were NWBHM, Motörhead, and punk, the second album contained nuance of Ennio Morricone and H. P. Lovecraft. Metallica´s musical framework changed constantly. *The second factor* was their exceptionally strong desire to improve – not just music but also everything else. *The third factor* was the courage to find and utilize possibilities and coincidences – and they also went outside their comfort zone. Many other bands have said that Metallica got lucky. In reality, however, coincidences favor the active doers. *Fourthly,* band chemistry and dynamics were exceptional within Metallica. If someone started to become high and mighty, the band members quickly put a stop to it. Furthermore, Metallica got mercilessly rid of cruel and useless persons. *The fifth factor* was active networking, which is also closely related to the creation of the previously mentioned coincidences. *The sixth factor* was a working morale. Although the members of Metallica drank and fooled around, usually the situation was in control. For them, music came first – being a rock star and having fun came after it.

6. Conclusions and further study

This article provided an illustration of effectuation theory in music band context. Effectual logic is especially suited for creating new. This creation also regards to creating new kind of music as the studied Metallica case indicated, considered with the help of the following imaginary example. Let us give ten new bands the task to create new kind of music by combining different music genres, which also Metallica did in the early 80´s. How different would these bands' debut albums be? What if, after each debut album, different bands would be asked to combine influences from some no-heavy bands in their next album? When this cycle would be repeated a couple of times, how far away would the albums of these bands be from each other? When we add matters related to the record label, producer, manager, etc., there would be even more dispersion between the bands. For instance, could another popular thrash band of the '80s, Slayer, have made at some point in their career a release such as the *Black* album and markets such as the Metallica family? Probably not. As effectuation theory tells us, people make the future with their own activities. And since people and their networks are different, also the end results are inevitably different.

The research generated some new research ideas. It would be useful to study in the Metallica case the relationship between effectual and causal logic and how those logics changed and alternated over time. Also studying

Metallica from 1991 to the present day might also be rewarding as the band started to head into a more peculiar direction and also lose fans as a result of these musical changes. It would be interesting to carry out research to other bands that have also created new music genres and vast global markets. From the heavy genre come to mind, for example, Iron Maiden, Black Sabbath, and Judas Priest. It would also be worthwhile to study pioneer bands of other genres, for instance, jazz, punk, and blues. In addition, an interesting research area of effectual logic would be artists created calculatedly – in other words, born big/global with the power of money. Although, these bands are based on causal logic per se (or are they?), probably they would also exhibit several characteristics of effectual logic.

Finally, is it worthwhile considering whether it is sensible to analyze band cases of the 1980s today? However, the same principles pretty much matter even today. In the music world, the biggest change has occurred due to the Internet. These days everything happens faster and, in principle, all artists are one click away. Bands are not nearly as distant to fans as they were before. Thus, transparency is on a completely different level than in the 1980s, due to which also markets can develop considerably faster. However, the Internet will not change the basics. The actions of bands and their stakeholders have an impact on whether the band will be successful or not. In any case, it would be worthwhile to study profoundly some new generation band, which has been created and lived during the Internet era.

References

Berlinger, J., & Sinofsky, B. (2014). *Some Kind of Monster*. United States.

Bhide, A. (1992), Bootstrap Finance: The Art of Start-Ups. *Harvard Business Review*, *70* November-December, 109-117.

Christiansen, R.J., & Porter, R.E. (2009). *Bootstrap Business: A Step-By-Step Business Survival Guide*. Wizard Academy Press.

Effectuation website, available at www.effectuation.org, read on August 25th, 2014.

Brannigan, P., & Winwood, I. (2013a). *Birth School Metallica Death, Volume 1*: *The Biography*. Da Capo Press.

Brannigan, P., & Winwood, I. (2013b), *Birth School Metallica Death, Volume 2*: *The Biography*. Da Capo Press.

Eglinton, M. (2010). *James Hetfield: The Wolf at Metallica's Door*. IMP Publishing: Independent Music Press.

Financial Times Lexicon (2016). Retrieved from: http://lexicon.ft.com/Term?term=entrepreneurial-mindset

Furr, N., & Dyer, J. (2014). *The Innovator´s Method*. Harvard Business Review Press.

Halfin, R., Hammett, K., & Ulrich, L. (2010). *The Ultimate Metallica*. Chronicle Books.
Lepore, S. (2015). Facing Facts: Artists Have to be Entrepreneurs. Retrieved from http://howlround.com/facing-facts-artists-have-to-be-entrepreneurs
Leppänen, O. (2013). *Liiketoimintasuunnitelma roskakoriin*. Tammi.
List of best-selling music artists. (2016). Retrieved from https://en.wikipedia.org/wiki/List_of_best-selling_music_artists.
McGrath, R.G., & MacMillan, I. (2000). *The Entrepreneurial Mindset: Strategies for Continuously Creating Opportunity in an Age of Uncertainty*. Harvard Business Press.
McIver, J., & Hammett, K. (2011). *To live is to die. The life and death of Metallica´s Cliff Burton*. Jawbone.
McIver, J. (2009). *Justice for All: The Truth about Metallica*. Omnibus Press.
Metallica Album Sales Statistics. (2016). Retrieved from: www.statisticbrain.com/metallica-album-sales-statistics/
Nienhuis, M.D. (2010). *Effectuation and Causation: The Effect of Entrepreneurial Logic on Incubated Start-up Performance. The predictive value of effectuation in business plans*. Master's Thesis. The Netherlands: University of Twente.
Read, S., Sarasvathy, S., Dew, N., Wiltbank, R., & Ohlsson, A.-V. (2010). *Effectual Entrepreneurship*. Routledge.
Ries, E. (2011). *The Lean Startup: How Constant Innovation Creates Radically Successful Businesses.* Penguin Books Limited.
Rojas, J. (2010). *The art of the bootstrap*. Retrieved from http://venturebeat.com/2008/11/20/the-art-of-the-bootstrap/
Sarasvathy, S.D. (2001). Causation and Effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, *26*(2), 243-263.
Sarasvathy, S. (2009). *Effectuation: Elements of Entrepreneurial Expertise*. Edward Elgar Publishing.
Schumpeter, J. A. (1976). *Capitalism, Socialism and Democracy/*. Routledge.
Sims, P. (2011). *Little Bets: How Breakthrough Ideas Emerge from Small Discoveries*. Free Press.
Spicer, W., & Moore, J. (2012). *Mission to Lars*. United Kingdom.
Sveningsson, S., & Alvesson, M. (2003), Managing managerial identities: organizational fragmentation, discourse and identity struggle. *Human Relations*, *56*(10), 1163-1193.
Wall, M. (2011). *Enter Night: A Biography of Metallica*. St. Martin's Press.
Wikipedia about Metallica. (2015). Retrieved from en.m.wikipedia.org/wiki/Metallica

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CONSIDERING DIFFERENCES IN ORGANISATIONAL CULTURE MAKES JOINT SCIENCE -BUSINESS PROJECTS SUCCESSFUL

***Joanna Wójcik Bubała*[1]**

Abstract
R&D projects performed by the joint academia- business teams, become more popular. Both, academia and business have different organizational culture and different motivation to join the projects. The diffusion between the cultures is reasonable and brings significant benefits as well to the academia as to the business. In this article the following thesis is formulated: there are cultural differences between academia and business that significantly influence the success of the joint projects. Those differences should be taken into consideration while managing the projects and additional activities should be applied to ensure the project success. The article formulates the thesis, which the present cultural differences between science and business environments have significant influence at the further long-term cooperation. To confirm or negation the thesis the additional research and analysis are required. The project managers of jointly delivered projects should consider the differences in organizational culture of both science and business environments, and apply extra effort to ensure project success. Based on the theoretical analysis the success factors are defined. The good practices of the earlier projects are pointed out. The article proposes the inclusion of activities into the PMI project management to unify the project culture.
Keywords: *project management, academia-business collaboration, science-business collaboration, science-industry collaboration, success factors.*

1. Introduction

Research and Development (R&D) supports collaboration between research units (science) and business. Compared with other European countries, the financing of research and development by private capital in Poland is relatively low, at less than 1% of GDP in 2011, while the EU-28 average amounted to 2% (Eurostat, 2014). According to PWC report on research and development projects, in the years 2012-2015, Polish entrepreneurs quite actively pursued

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partnership projects in R&D. More and more businesses opt for R&D projects undertaken jointly with scientific institutions (33%) and other companies (24%). Still, big companies are more active in carrying out such projects. Only 1/3 of joint R&D projects are carried out by small and medium-sized enterprises (SMEs) (36%). Previous statistics published in 2012 by Eurostat indicate that 31% of EU entrepreneurs were involved in developing innovation (introduction of new products and services) in cooperation with other entities. Such cooperation was most popular in the UK (67%), while, in Poland, it amounted to 30%, at average European level.

A number of incentives are further introduced to convince entrepreneurs to engage in financing joint R&D projects. For many years highly developed economies such as the United States and Japan have used fiscal incentives to promote R&D. Such ways of stimulating innovations have also been adopted by European countries, including Poland. Studies that are more rigorous find that one euro of foregone tax revenue on R&D tax credits raises expenditure on R&D by less than one euro.

Cooperation between science and business communities in Poland is still developing. In the future, thanks to cooperation, the activities of entrepreneurs and scientists probably will often interweave. It may also contribute to raising the level of innovation and bringing the joint projects to successful completion. For this to happen, one should understand what the key success factors of such projects are and how to effectively manage joint projects.

This paper is an attempt to identify the areas on which entrepreneurs and researchers particularly differ, based on literature review and observations made hitherto. The article also indicates those areas of project management that project managers should pay close attention to, in order to minimize the risk of failure. Successful completion of joint projects will give the base for establishing a long-term cooperation, which is the ultimate goal of this type of projects. The effects of projects carried out cooperatively by the scientific and business communities provide interesting material for further observation and empirical research.

This article is comprised of six parts, including the introduction and the conclusion. It presents the differences in the approach to project management and implementation between science and business projects (Kubiński, Kwieciński & Żurawowicz, 2010). Then it discusses the benefits of staff exchange as a way of building long-term relationships which foster the implementation of joint projects. The article identifies success factors and the key areas in which project management should particularly take into consideration, in order to successfully finalize joint science and business projects. The final part also contains a proposal for further empirical research on the impact of joint projects on long-term cooperation.

2. Key differences in of business and science culture

Implementation of joint research and development projects is beneficial to both entrepreneurs and scientists, even in spite of the differences in the approach to the performed tasks. Kubiński et al. (2010) compare the characteristics of researchers and entrepreneurs (Table 1) to illustrate the different motivation and approach of researchers and entrepreneurs to project implementation.

Table 1. Characteristics of scientist vs. the characteristics of an entrepreneur

Characteristics of a scientist	Characteristics of an entrepreneur
Creating intellectual value	Economic success
Long time horizon of actions	Long or short time horizon of actions (depending on needs)
Insight and precision	Effectiveness
Focus on mission/duty	Focus on market
Deductive or analytical approach/Disciplinary	Inductive or synthetic approach
Exploration/curiosity	Purpose or problem-oriented
No time limits	Bound by schedule
Public interest	Private (corporate) interest
Objective: scientific authority	Objective: strengthening the company's position on the market

Source: Kubiński et al. (2010).

A study published by Kubiński et al. (2010) discovered a low level of cooperation between science and business, resulting from the lack of understanding of mutual needs, differences in working style, bureaucratic and formal reasons, or lack of communication. Both the studies carried out by PWC and NCBR in 2014 and the earlier study published by Kubiński et al. (2010) show that the business undertakes market-oriented actions, with a desire to achieve success through implemented results. The project's costs are one of the factors determining its implementation. Business perceives time as a value that can be converted into money. Hence the desire for effective implementation of the project in a relatively short time and control of its results during the project. The leading motivation in business is the aspiration to effectively implement the results of operations on the market effectively.

Scientists often work in an environment where no time pressure is imposed on activities they undertake, and the mission to create new intellectual value is the overarching motivation for the implementation of projects. With such significant differences in the work culture, a passive attitude of waiting for a joint project to emerge is ineffective. Seeking new opportunities in a more proactive approach is much more fruitful. The rapprochement of two such distant cultures as science and business requires efforts before and during the project. Jasieński, Candi and Rzeźnik (2015) indicate that workshops dedicated for companies of

different size and conducted by scientists prove to be effective in networking. New contacts established there usually result in further cooperation.

3. Staff exchange as a way of building long-term cooperation

The exchange of staff and secondments are common practices of establishing cooperation both in the scientific and business community. Cross-exchange between universities and business is also becoming more and more common. It promotes not only the building of long-term relationships but, above all, the transfer of knowledge. In the Reinvent project (Jasieński et al., 2015), long-term secondments brought not only the transfer of knowledge between scientists and business or the establishment of long-standing cooperation but primarily a rapprochement of several cultures different in their organizational culture or nationality.

This type of staff exchange, lasting from a few weeks up to a few months, has numerous advantages. They are conducive to building mature, long term relations (Boulton, 2014). Those advantages include, among others (Table 2):

Table 2. The benefits of staff exchange

Benefits for academics (universities) include	Benefits for companies (business) include
• Understanding the context for their research, leading to more usefully applicable research • Access to real data • Providing impact examples • Broadening the range of contacts • Broadening the number of researchers involved • Reducing the workload in relationship maintenance • Linking to juniors who may eventually rise to positions of influence. • Enabling salary top-ups that makes recruitment of researchers easier	• Acquiring and assimilating new capabilities • Acquiring access to non-core capabilities and facilities • Solving specific problems • Access to 'different' thinking • Building a broader network of contacts • Foresight about new technologies and new directions • Staying close to the 'state of the art' • Benchmarking their own capabilities • Providing career options • The kudos of being seen to work with Cambridge • Serendipitous contacts, discoveries and new directions

Source: Boulton (2014).

The cultural rapprochement of business and science and, above all, the understanding of success factors allow increasing the likelihood of success and reducing the risk of failure of joint projects.

4. Success factors of joint science and business projects

An analysis of good practice resulting from joint projects identifies the key areas crucial for the successful project implementation: the credibility of the

partner, project management, trust management process and mutual benefits (Barnes, Pashby & Gibbons, 2002). On the basis of a ten-year study conducted in European organizations, Klofsten and Jones-Evans (1996) identified the most important aspects of joint projects implementation, namely:

- projects have to solve real problems,
- they must be conducted by a dedicated team,
- they must have a clear goal,
- partners must be reliable and closely related.

Pescas and Henriques (2006), on the basis of the 20 projects carried out by the Technical University of Lisbon, have also determined that business must be open to the absorption of new knowledge derived from this type of cooperation, while universities should preserve the confidentiality of information, as well as fulfil the objectives of the project in a timely manner. Research of the projects conducted jointly by science and business communities in Sweden and in Australia (ICEE Software, 2012), and the results of other studies on cooperation in projects involving universities and small and medium-sized enterprises (SMEs). Demain (2001), Guthrie and Ward (2002), Pecas and Henriques (2006), Davenport et al. (1999) clearly indicate the essential elements conducive to the project success:

- support for the project at the top management level of the company involved in the project,
- authorized project leader instead of someone who simply executes tasks,
- aligned understanding of the same issues by the "business team" and the "science team",
- numerous personal interactions within project teams. Regular, daily interactions within the team support achieving project success,
- soft skills play a significant role in long-term projects.

The elements conducive to achieving success increase the likelihood of successful project completion and indicate to the project manager which project management activities require special attention.

5. Success factors and project management

The project manager of the joint science and business project should take into account the cultural differences between those two communities. Starting from the main areas of activity in project management (according to PMI methodology, see e.g. Figure 1), we define those that require special attention during the implementation of joint projects.

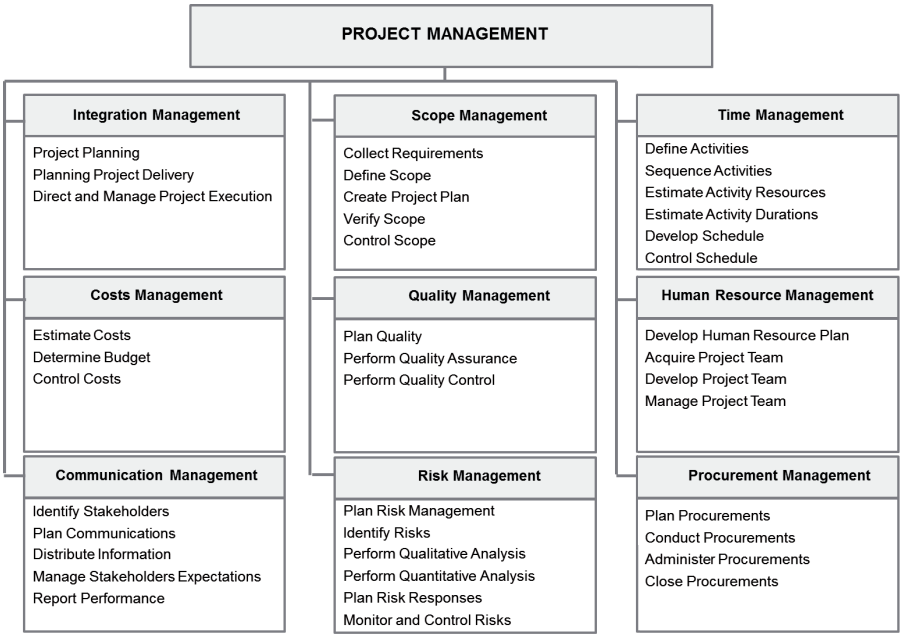

Figure 1. Project management activities by PMI

Source: Project Management Institute (2000).

PMI methodology of project management specifies nine areas of activity:

1) Integration management, including coordinating activities such as planning, coordinating changes.
2) Scope management, including defining the scope of the project, its verification, monitoring modifications in project's scope.
3) Time management, including defining a schedule, tasks, their order, schedule execution and control.
4) Cost management, including essential resource planning, budgeting and cost control.
5) Quality management, including all activities, aimed to meet user requirements with respect to project's quality characteristics.
6) Human resource management, including efficient resource allocation, acquiring contractors and employees.
7) Communication management, including preparation of the communication plan, ensuring efficient flow of information, selecting appropriate communication channels.
8) Risk management, including risks and issues identification and analysis, planning preventive actions and control over their implementation.

9) Procurement management, including planning and conducting procurement of goods and services necessary to implement the project.

Table 3. Examples of activities in project management, supporting the success of joint science-business projects

Success factor	PMI project management areas	Activities in project management
Trust between project partners	All areas of project management	• Defining the frame of cooperation • A confidentiality agreement • Defining intellectual property rights
Support at the top management level	All areas of project management	• Defining the project goals, scope, schedule, and budget • Informing the management Board regularly about the project's progress • The commitment of the top management to make crucial decisions about the project • Informing stakeholders of the project's progress
Project leader's authority	Human resources management Communication management	• Working experience of the project manager in project delivery
A clear project goal	Communication management	• Defining and communication of project goal • Selection of communication's frequency, channel and content
Numerous personal interactions within the project's team	Team management Communication management	• Regular exchange of information about the project's progress • Joint implementation of selected tasks
A common understanding of the same issues by the "business team" and the "science team".	Communication management	• Clear and precise definition of the project's goals (SMART) • Defining milestones, deliverables • Regular communication within the team
Timely delivery of the project's tasks	Time management	• Clearly defined and communicated roles and responsibilities of the project teams • Defining tasks, deadlines, responsibilities. • Schedule control
Soft skills	Team management	• Planning development of the team members • Team building

Considering the differences in motivation, work specification and environmental conditions, it is critical to the project implementation that the project manager takes every action aimed at achieving final success. Table 3 indicates what actions may be taken by the project manager. This list remains

open and can be modified depending on the individual experience of the project manager.

Considering the benefits of long-term science-business cooperation, it is desirable to eliminate the obstacles to achieve the results (Cyran, 2015; Ujwary-Gil, 2009). Programmes and tax incentives aim to stimulate and support long-term cooperation between research centres and SMEs, also after the completion of the project. From the project management perspective, it would be very interesting to analyze project's progress in its key areas and the results of long-term cooperation within hindsight, for example after the end of the project's sustainability period. Such analyses would help to answer the question of how project management transforms into long-term cooperation of science and business. Is the cooperation continued after the project is completed, and if so, in what form?

6. Conclusions

Drawing upon the experience gathered hitherto with regard to cooperation between science and business; we know it could lead to both successes and failures. Thanks to understanding the differences in motivation and work style, and taking them into account in the management of joint projects, the number of successful projects will increase and thus it will contribute to the implementation of innovations. This paper describes a theoretical inclusion of success factors for joint science and business projects in the methodology of project management by PMI. It also identifies good practices based on research and the important areas of the PMI methodology, which should be taken into account in the implementation of this type of projects. The article also points out the project managers' attention to those project management areas which are particularly affected by different organizational cultures. Further studies will also answer the question whether the project management transforms into further long-term cooperation.

References

Barnes T., Pashby I., & Gibbons, A. (2002). Effective university – industry interaction: A multi-case evaluation of collaborative R&D project. *European Management Journal, 20*(3), June 2002, 272–285.

Boulton, C. (2014). *Secondment-Lessons from practice*. Retrieved from http://www.research-strategy.admin.cam.ac.uk/epsrc-impact-acceleration-account/best-practice-secondment

ICEE Software (2012). The success factors powering industry-academia collaboration. Retrieved form http://webcache.googleusercontent.com/

search?q=cache:tq7R_pPW7fYJ:digitalamedier.bth.se/com/jwi.nsf/bilagor/Success%2520Factors%2520powering%2520collaboration_pdf/%24file/Success%2520Factors%2520powering%2520collaboration.pdf+&cd=2&hl=pl&ct=clnk&gl=pl

Cyran, K. (2015). Bariery współpracy sfery biznesu z jednostkami naukowymi z perspektywy małych i średnich przedsiębiorstw. *Modern Management Review, 22*(3), 23-33.

Davenport, S., Davies, J. & Grimes, C. (1999). Collaborative research programmes: Building trust from difference. *Technovation, 19*(1), 31-40.

Demain, A.L. (2001). The relationship between universities and industry: The American niversity perspective. *Food Technology and Biotechnology, 39*(3) 157-60.

Eurostat .(2014). Retrieved from http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_20&plugin=1

Grzybowska, K. (2011). Współpraca przemysłu z nauką – przesłanki oceny koordynacji działań. Gospodarka i nauka – partnerstwo w logistyce. Wrocławskie Forum Logistyki i Technologii Logistycznych: WROLOG.

Guthrie, B., & Warda, J. (2002). *The road to global best: Leadership, innovation and corporate culture*. The Conference Board of Canada, 1-8.

Jasieński, M., Candi, M., & Rzeznik, M. (2015). *Bridging the academia-industry gap while innovating: Two example projects.* In M. Wirkus (Ed.), *Processes and Project Management* (pp. 61-69). Gdańsk: Wydawnictwo Politechniki Gdańskiej.

Klofsten, M., & Jones-Evans, D. (1996). Stimulation of technology-based small firms: A case study of university-industry cooperation. *Technovation*, *16*(4), 187-231.

Kubiński, P., Kwiecinski, L., & Żurawowicz, L. (2010). *Naukowiec przedsiębiorcą. Własność intelektualna.* Wrocław: Meritum.

Lisowska, R. (2015). External determinants of the development of small and medium-sized enterprises – empirical analysis. *Journal of Enterpreneuship, Management and Innovation, 11*(4), 2015, 115-138.

Mohnen, P. (2014). R&D Tax Incentives. Innovation for Growth. Retrieved from https://ec.europa.eu/research/innovation-union/pdf/expert-groups/i4g-reports/i4g_policy_brief__25_-_brief_RD_tax_incentives.pdf

Pecas P., & Henriques E. (2006). Best practices of collaboration between university and industrial SMEs Benchmarking. *An International Journal, 13*(1,2), 54-67.

Project Management Institute. (2000). *A Guide to the Project Management Body of Knowledge (Pmbok Guide) – 5th Edition.* PMBOK® Guide

PWC & NCN. (2015). Opłacalność inwestowania w badania i rozwój. Retrieved from https://www.pwc.pl/pl/publikacje/assets/ncbr-pwc-oplacalnosc-inwestycji.pdf

Ujwary-Gil, A. (2009). *Współpraca organizacji badawczych z uniwersytetem w regionie – doświadczenia norweskie.* In A. Nalepka, A. Ujwary-Gil

(Eds.), Organizacje komercyjne i niekomercyjne wobec wzmożonej konkurencji i rosnących wymagań konsumentów (pp. 204-215). Nowy Sącz: Wyższa Szkoła Biznesu – National-Louis University.
Waltoś S., Rozmus A. (2012). *Kariera naukowa w Polsce. Warunki prawne, społeczne i ekonomiczne.* Wolters Kluwer Polska Sp.z o.o.

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III.
FINANCIAL ASPECTS OF ORGANIZATIONAL MANAGEMENT

OPTIONS FOR FINANCING ECO-INNOVATION AVAILABLE TO ENTERPRISES

Aleksandra Szulczewska-Remi[1] and Zenon Foltynowicz[2]

Abstract

Any enterprises seeking to adopt eco-innovative solutions aimed at lowering their adverse environmental impacts and protecting natural resources face a high-cost barrier. The barrier precisely is the difficulty that plagues Polish businesses, which commonly suffer from insufficient internal funding and problems accessing external financing. Written in an environment in which new financial instruments, such as venture capital funds operating as public-private partnerships, are now emerging, the publication seeks to describe the latest instruments for financing eco-innovation focused on environmental aspects of furthering the sustainable development of enterprises. The study relies on the critical analysis and synthesis of scientific literature and key Polish and EU documents. Also presented are eco-innovation funding opportunities available to Polish enterprises.

Keywords: *financing of eco-innovation, EU funds, venture capital, eco-innovation.*

1. Introduction

Eco-innovation aimed at achieving the sustainable growth of enterprises by reducing adverse environmental impacts and protecting the existing natural resources requires enormous capital outlays. This capital outlays precisely are the difficulty faced in Poland where, according to many literature sources, the primary hindrance to eco-innovation is the shortage of own funding and insufficient access to external financing. This conclusion has been confirmed by a 2011 Eurobarometer survey of EU businesses carried out by Gallup Institute It was found that the predominant barriers to eco-innovation faced by 38% of Polish-based companies are fund deficiencies, uncertain return on investment in eco-innovation (37%), uncertain market demand (35%) and the lack of external financing (33%) (The Gallup Organization, 2011).

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According to Foundation for the Environment (2010), the key barrier to the use of eco-innovative solutions, faced by 68% of enterprises, is insufficient funding and prohibitive deployment costs (61%). This finding has been backed by the surveys by Zuzek (2015), Mazur-Wierzbicka (2014) and Ryszko (2014). A 2014 study of eco-innovation has placed Poland in the penultimate 27th place in a pan-European-Union ranking which relied on 16 indicators. Poland's lowest scores on such indicators were posted on the inputs side, and specifically on governmental spending on R&D in the fields of environment and energy, green investments by PE/VC funds and employment in the R&D sector. To make things worse, such indicators declined by one-third in the last years (Grodzicka & Wojtach, 2013; Ozdoba, 2015).

The literature on eco-innovation financing instruments classifies them into own resources and financial institution funding (bank loans, private equity funding, e.g. venture capital), internal and external funding by affiliates (subsidiaries and other associated companies). Also, third-party enterprise funding (by non-financial sector businesses), public financing and the funding of international organizations (Wielgórka, 2013; Janik, 2015). Smolorz (2011) proposes a classification into private non-repayable capital (business angels) and share issues (venture capital funding), public-private non-repayable capital (EU subsidies and loan funds) as well as repayable private capital (bank loans and non-bank crediting) and debt-security issues.

The options for financing eco-innovation available to the SME sector in the recent past have been described broadly by Wyrwa (2010). According to the Ministry of the Environment (2008), "Poland's primary sources for funding environmental projects are environmental protection and water management funds (one national, 16 regional, 2489 municipal and 373 county environmental protection and water management funds); own resources of enterprises, municipalities and state agencies; the funds of domestic lending banks; the state budget and the budgets of regional governors; foreign funds, including those of the European Union, whose share has been growing since 2004, and other sources, including the Agency for the Restructuring and Modernization of Agriculture, Fundacja Wspomagania Wsi (Rural Support Foundation), EkoFundusz (EcoFund), and other foundations."

Considering the significance of the issue, the authors of the article have set out on providing an overall description of the latest instruments for financing eco-innovation in businesses, which are aimed at supporting the related projects and furthering the environmental aspect of the sustainable growth of businesses.

2. Significance of eco-innovation for enterprises

Climate change, natural resource depletion and the loss of biodiversity are all major challenges faced by today's world in its bid to protect the environment. According to the European Commission, one way to resolve the issue of environmental degradation is to make environmentally friendly investments (Foltynowicz, 2009). The notion of innovation has gained popularity in recent years thanks to a number of European Union initiatives, including support various programmes. The term is used as defined in the Oslo Manual (Oslo Manual, 2008) whereby an innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.

Innovation is inextricably linked with sustainable development aimed at ensuring the growth of the economy while affording equal treatment to social and environmental aspects. The link between the two areas is eco-innovation, which seeks to reduce the environmental impact of products, processes and technologies while boosting competitiveness and economic growth (KPKPB UE, 2008).

According to the Oslo Manual, eco-innovation takes the form of either product or marketing innovation. Environmental innovation, as described in (KPKPB UE, 2008) represents "new production processes, technologies, services and products designed to reduce adverse environmental impacts. Environmental innovation is a chance to adopt sustainable solutions that will help use natural resources efficiently and reduce negative environmental impacts while ensuring a high level of innovation".

Jones, Harrisom and McLaren (2001), Fiedor (2002), Woźniak, Trinks and Bącal (2004) offer some definitions of eco-innovation, which largely correspond to the above but differ in their specific approaches. According to Ziółkowski (2008), environmental innovations are innovations "comprised of new processes, techniques, practices, systems and products that help eliminate or mitigate environmental impacts". Eco-innovation is commonly associated with such other notions as ecological, environmental or green technologies, all of which are technologies that provide an environmental benefit.

Eco-innovation, i.e. innovative products, technologies, and services are aimed not only at reducing environmental impact by, among others, preventing pollution and contamination but also at achieving more effective ways of utilizing energy and other natural resources while boosting competitiveness and economic growth. The most common classification refers to eco-innovation that is:

- technological, e.g. products and processes,

- social, e.g. behaviors, consumption patterns,
- organizational, e.g. environmental audits and green R&D,
- institutional, e.g. collaboration platforms, informal groups, and networks established to address environmental issues.

In 2009, OECD published the "Eco-Innovation in Industry: Enabling Green Growth" report (OECD, 2009) presenting, among others, an overview of the concept of sustainable development and eco-innovation, the diversity of eco-innovation in industry, benchmarking based on established indicators performed to attain sustainable growth, strengths and weaknesses analysis in connection with the established methods of measuring eco-innovation on a macro-scale as well as national strategies and initiatives designed to further eco-innovation in OECD countries (Borucka & Foltynowicz, 2010).

By combining innovative solutions with care for the natural environment, eco-innovation caters to the demand of today's economies. The positive influence of eco-innovation on businesses has been described by Ziółkowski (2009), whose starting point in his discussion of the significance of eco-innovation for enterprises was an adverse environmental impact. Eco-innovative technologies make it possible to rule out or minimize negative environmental impacts. Eco-innovation helps enterprises reduce environmental penalties and charges, cut the cost of procuring depleted natural resources and lower their dependence on conventional energy sources. In this manner, eco-innovation exerts a positive impact on the investment capabilities of enterprises.

Needless to say, eco-innovation entails substantial starting outlays as well as uncertainty as to the return on investment. However, the European Union and Poland's national government have launched a number of programes in support of eco-innovation available in the new financial perspective 2014-2020 (Foltynowicz, 2009; Lipińska, 2013). Europe's environmental industry accounts for a significant part of the economy. Its annual revenues are estimated at EUR 319 billion, that is approximately 2.5 times the European Union's GDP (Eco-Innovation Action Plan) (European Economic and Social Committee, 2012).

3. Research methodology

To ensure a comprehensive analysis, a critical review of the relevant literature has been conducted with the use of such electronic scientific databases as Scopus, Google Scholar, and JSTOR as well as the library resources of the Poznań University of Economics. This made it possible to gather information on the possible financial instruments that support eco-innovation, which was then described and used to formulate the research problem (Lisiński, 2016).

Publications were selected by the random snowball sampling method with proper account taken of relevant English-language articles. Of the total of 247 scholarly articles and strategic documents, the authors selected 62, which they classified into the categories of:

- strategic articles and documents on financing eco-innovation with EU funds in the European Union member states,
- strategic articles and documents on financing eco-innovation with EU funds in Poland,
- strategic articles and documents on financing eco-innovation with domestic funds,
- strategic articles and documents on financing eco-innovation with financial sector capital,
- strategic articles and documents on financing eco-innovation with private equity funds.

The problem which initially inspired the research was the capacity of businesses to fund eco-innovation – its identification was the primary condition for launching the project (Malhotra and Birks, 2007). The research output was summarized by bringing together the findings of each part of the project.

4. Financing eco-innovation with EU funds in European Union member states

Eco-innovation has become one of the key priorities of the European Union's social and economic development program. Therefore, its leading documents such as "Europe 2020", "Innovation Union" and "Resource-Efficient Europe" recognize the need to increase investment and identify instruments and resources to be used for that purpose.

As a Europe 2020 flagship initiative, resource-efficient Europe is designed primarily to facilitate the transition to a low-carbon economy, increase resource efficiency and decouple economic growth from resource use. While more stringent environmental protection standards are bound to boost eco-innovation, it is also essential to increase stability and certainty for investment and innovation. The new eco-innovation action plan (EcoAP) is thus to foster the innovation that reduces environmental pressures and facilitates the bringing of innovative products to market. A pivotal part of this effort is to mobilize financial instruments and services to support SMEs (European Economic and Social Committee, 2012).

The above tenets have been expressed in Horizon 2020, the EU's biggest yet research and innovation program. The initiative promotes not only research on new solutions but also its supervision, implementation, commercialization and on-market development. One of the program's innovative instruments is EU Finance for Innovators (InnovFin). This joint project of the European

Commission and the European Investment Bank Group (the European Investment Bank and the European Investment Fund) consists of a wide range of products, including loans and guarantees for large enterprises, research institutions and institutions of higher education, long-term preferential and subordinated loans, as well as mezzanine financing (which usually refers to the financing positioned between senior debt and shareholders' equity) for midcaps and debt financing guarantees for SMEs.

Fast Track to Innovation (FTI) is a pilot associated with e.g. advanced testing, pilots, and demonstrations centered around themes which include climate and environmental protection and resource efficiency, which has received an allocation of EUR 100 million.

Support for the competitiveness of small and medium-sized enterprises is available in the COSME program (Program for the Competitiveness of Small and Medium-Sized Enterprises) aimed mainly at boosting the competitiveness of European SMEs by, among others, supporting activities that promote eco-innovation. A number of guarantee instruments (including free guarantees for financial institutions), as well as equity tools for private equity funds such as venture capital, have been envisioned.

A host of opportunities has been created that facilitate the co-financing of environmental and climate protection projects under the EU financing program LIFE, whose National Contact Point is the National Fund for Environmental Protection and Water Management (NFEPMW). With the support of the European Commission and the NFEPMW, the program funds contributes 95% of eligible expenditures to projects aimed at protecting natural resources, combating climate change and increasing energy efficiency (LIFE, 2016; Regulation (EU) No. 1293/2013 of the European Parliament and of the Council of December 11, 2013).

One of the first trans-national programs carried out under the cohesion policy of the European Union was INTERREG Europe 2014-2020 envisioned for the 28 member states of the EU as well as Norway and Switzerland. Thematically, the program covers low-carbon strategies, supports the transition towards a resource-efficient economy and promotes "green growth" and eco-innovation. Its beneficiaries are public authorities and public institutions as well as privately-held non-profit organizations. Eligibility is limited to partnerships made up of at least three states, two of which are EU member states (INTERREG Europe 2014-2020).

INTERREG Central Europe – Central Europe 2020 Cooperation Programme, in its turn, proposes to strengthen regional innovation capacities with a view to increasing the competitiveness of Central European states. This can be achieved by promoting cooperation among enterprises, R&D institutes, and universities. The funding is available for solutions that foster low-carbon

economies, combat climate change and achieve energy efficiency by, among other things, resorting to renewables, improving energy efficiency in public infrastructure, promoting resource management efficiency and raising the quality of urban environment (Central Europe 2020 Programme).

5. Financing eco-innovation with EU funds in Poland

Due to the cross-cutting nature of eco-innovation, the priority in its financing in Poland is to establish an efficient system for coordinating the work of the public institutions appointed to act as implementing bodies (Szpor & Sniegocki, 2012). Grodzicka-Kozak and Wojtach (2013) notes the need to develop a systemic concept of financial aid for eco-innovation within the framework of a Joint Action Strategy of the National and Regional Environmental Protection and Water Management Funds.

Osuch-Rak and Proczek (2014) have also pointed out the need for complementarity and synergies across EU and national policy instruments as well as comprehensive investment project financing covering the entire track from the conception of ideas to the creation of innovations that respond to the actual needs of entrepreneurs. Godlewska (2014), in her turn, proposes to break funds down into those focused on:

- low-carbon economy, including energy efficiency, renewable energy sources, and eco-innovation,
- sustainable transport,
- environmental infrastructure,
- sustainable agriculture.

With reference to the above categories, the financing extended to public institutions (including local government authorities) and private organizations (mainly large enterprises) for measures aimed at reducing air emissions, protecting the environment, combating and adjusting to climate change and increasing energy efficiency, has been envisioned primarily in the Operational Programme Infrastructure and Environment (OPIE). "Priority I: Reduction of emission levels in the economy," is designed to support "the production and distribution of renewable energy; energy efficiency, enterprises' reliance on renewables as well as energy efficiency, intelligent energy management and the use of renewables in public infrastructure, including in public buildings and housing." Meanwhile, under Priority II: "Environmental protection, including adjustment to climate change", a merger is sought between the two thematic goals of "promoting adjustments to climate change and preventing and managing risks" on the one hand and "environmental conservation and protection and promoting efficient resource management" on the other. In view of the above priorities, enterprises are eligible to receive support for

investment projects that fall within such scope (Operational Programme Infrastructure and Environment, 2014).

Financed in full by the European Regional Development Fund, Operational Programme Smart Growth (OPSG) is principally an investment program. The benefits it offers consist largely in access to funding at the stage of the pre-incubation of start-ups that rely on innovative ideas, VC investment aimed at commercializing R&D outcomes, syndicate (group) financing by business angels, loan financing and investment in infrastructure development and research equipment. The program also offers to finance for advisory services and market research extended to enterprises looking for industry or equity market investors (Stock Exchange, NewConnect and Catalyst markets).

Support for the eco-innovative deployments of (own or purchased) products or processes in enterprises can be provided as long as the entrepreneurs involved hold patent rights, licenses and have the required know-how. The instrument is to be supported under the open innovation formula proposed by Chesbrough (2006) in which enterprises may use the outcomes of not only their research but also of that carried out by other organizations. Furthermore, the plan includes the establishment of a guarantee fund which will provide guarantees to banks extending loans for deployments of R&D outcomes. The assumption of a portion of the risk by a guarantee fund provides an incentive for private equity to finance innovative projects. Such projects will, therefore, be funded with bank loans (with an own contribution of at least 25%). Such loans will be repaid in part with public funds in the form of the so-called technological premium. The instrument is designed for micro, small and medium-sized enterprises. The relevant implementing institutions are the Polish Agency for Enterprise Development and Bank Gospodarstwa Krajowego.

The National Centre for Research and Development is going to serve as an intermediary body that finances research and development "aimed at developing a solution (product, technology and/or service) that helps protect the environment and meets eco-innovation criteria". Such projects will be focused on achieving "cleaner processes, materials, and products; generating cleaner energy; utilizing waste in production; closing the water and sewage circulation loop, etc." and ultimately developing a solution that will lower the consumption of materials and energy in production, reduce pollution, increase materials and waste recycling rates and increase the share of renewables in the energy mix" (Operational Programme Smart Growth, 2015).

6. Financing eco-innovation with domestic funds

The national environmental priorities are defined in such strategic documents as the NFEPMW strategy for 2013-2016 with a view to 2020, the Joint

NFEPMW – RFEPMW Strategy for 2013-2016 with a view to 2020 and the Energy Security and Environment Strategy. The documents express goals for four basic objectives pursued in financing environmental protection in Poland: "sustainable conservation and management of water resources, waste management and soil conservation, atmosphere protection, including combating climate change and the conservation of nature and bio-diversity." The 2020 Mid-Term Development Strategy for Poland (2012) underscores the significance of eco-innovation for "the rational consumption of energy and the supply of clean and safe energy (including renewables and clean energy based on fossil fuels)."

A joint NFEPMW and NCfR&D program named GEKON, which is an acronym for the Polish-language equivalent of Environmental Concept Generator, has been developed in response to the challenges defined in the above documents. The programme supports research and development work as well as the deployment of the resulting innovative environmentally friendly technologies in the five selected areas of "environmental aspects of procuring unconventional gas, energy efficiency and storage, conservation and rational use of water resources, the development of renewables and innovative methods of producing fuel, energy and materials from waste and waste recycling". GEKON is designed for entrepreneurs, the consortia of research institutions and entrepreneurs and groups of enterprises acting together (NCfR&D, NFEPMW, 2013).

Another initiative, this time of international scope, is EUREKA, a network associating 40 European states which collaborate in industrial research and development and produce outcomes that can potentially be sold on a commercial basis (NCfR&D, 2016). The GreenEvo Green Technology Accelerator of the Ministry of Environment disseminates green technologies domestically and internationally with a view to attaining a circular economy (Ministry of Environment, 2015).

7. Financing eco-innovation with financial sector capital

A popular vehicle for financing eco-innovation is bank loans and leasing, both of which are offered by a growing number of banks in Poland. The most comprehensive range of such products is being offered by Bank Ochrony Środowiska S.A. (Bank of Environmental Protection) for financing investment in new technologies and energy-consumption-reducing devices as well as projects in the fields of energy efficiency, renewables, thermal improvement of buildings, water and material conservation in production and environmental projects. The bank's loans are backed by contributions from the NFEPMW (or its regional chapters).

One such product is the *Energia na Plus* loan offered under a foreign credit line of the European Investment Bank within the framework of the Energy Efficiency Programme for Small and Medium-Sized Enterprises (SMEFF EE), repaid in part with a European Union grant provided to offer a financial incentive to borrowers. This financing is designed for projects which reduce carbon emissions and energy consumption in industrial and residential buildings and projects of building installations for renewable sources of energy (Żyła, 2014).

A new Bank Gospodarstwa Krajowego (BGK) product which makes it possible to purchase or implement new technologies in enterprises is a technological innovation loan constituting a non-repayable financial support instrument extended to micro-, small- and medium-sized enterprises planning to adopt technological innovations with the support of EU funds. The program is distinguished by the technological premium consisting of EU financial support offered by BGK towards the repayment of a company's debt.

According to Gabryś (2011) and Dziawgo (2010), the financial instruments offered by banks include special-purpose and other deposits, payment cards with a fee that supports an environmental cause, structured products (comprised of the shares and bonds of environmentally friendly issues or stock market indices of corporate social responsibility), shares having a declared environmental purpose (e.g. World Bank Green Bonds), bonds, investment fund units and short-term debt securities.

8. Financing eco-innovation with private equity

The so-called equity gap and difficulties accessing external funding create opportunities for the development of specialized financing such as private equity. Venture capital is designed mainly for young and innovative businesses which need capital to develop rapidly their products (Baygan & Freudenerg, 2000).

The usage of the term venture capital in Poland follows the definition of venture capital offered by the Polish Association of Equity Investors which refers to investments made at early stages of corporate development and designed to start up a company or secure its expansion (PSIK, 2014; Fałat-Kiliańska, 2014, p. 14). Such investments may be conducted to develop new products and technologies, increase working capital, acquire companies or improve and strengthen a company's balance sheet. Note that according to research by Faria and Barbosa (2014), VC financing is at its most effective in later stages of project development as it is more useful for commercializing innovations rather than their creation.

The literature offers ample examples of the benefits to be derived from financing investment with venture capital. Such benefits include:

- appreciation in company value during the investment period, i.e. 5-7 years,
- the ability to carry out projects even despite the high risk involved,
- investment risks diversification resulting from the presence of an investor,
- improvements in the company's balance sheet by changing the ratio of company debt to shareholders' equity and increased creditworthiness,
- better liquidity resulting from being relieved from the obligation to pay interest,
- access to new business contacts,
- boosted competitiveness and improved market position (Przybylska-Kapuścińska & Mozalewski, 2011, pp. 53-54; Rosa, 2008; Sobańska-Helman & Sieradzan, 2004).

Note that numerous reports, such as "The Private Equity Market in Poland: Facts and Opinions" (KPMG, 2014) portray Poland as the region's most important and attractive private equity market (including VC). This results from the pace of the country's economic growth, the stability and the size of its economy as well as the size and liquidity of the share market (Groh et al., 2014). Poland has for years topped the annual ranking of Roland Berger "European Private Equity Outlook" in terms of the anticipated growth of the PE market, including VC.

It should also be mentioned that according to the European Venture Capital Association (EVCA), investment in the energy and raw materials sector amounted to 7% of all PE investments in Poland in 2007-2010, while the energy sector and the environment accounted for 4% in 2014, which shows there is still tremendous investment potential in these areas. This triggered the emergence of new public-private mechanisms involving equity funds such as the BRIDGE program of the National Centre for Research and Science aimed at supporting the effective marketing of scientific and R&D outputs. BRIdge Alfa targets ideas found to be at the seed phase at which the risk of investment failure is the highest but can be verified at a relatively low cost. Investors are provided with non-repayable support extended by NCfR&D for the development of new ideas having a vast commercialization potential.

One of the key links in the chain of SME financing is business angels which close the funding source gap between equity acquired from friends and family members and VC funds. According to studies by the European Commission, the total annual volume of investment carried out with the help of business angels amounts to an estimated EUR 10-20 billion (compared to the value of all private equity funds in Europe in 2002 and 2003 which amounted to EUR 27.6 and 29 billion respectively) (Mikołajczyk & Krawczyk, 2007).

In Poland, business angels are still in their infancy due in part to insufficient recognition and a poor understanding of the nature of their work (Brzozowska, 2008). There are opportunities to remedy this through projects that support private investor networks with the structural funds of the EU, e.g. within the framework of the aforesaid Operational Programme Smart Growth.

One should also take a note of suggestions to use unconventional eco-innovation financing such as crowdfunding (Chrzanowski & Dziedzic, 2014) and crowdsourcing (Woźniak, Dziedzic & Chrzanowski, 2014).

A summary of all eco-innovation financing mechanisms available in Poland is provided in Table 1.

Table 1. Selected eco-innovation financing mechanisms in Poland

Type	Support mechanism
EU funds available to EU member states	Horizon 2020, including InnoFin, FTI and COSME LIFE INTERREG Europe 2014-2020 Central Europe 2020 Cooperation Programme
EU funds in Poland	Operational Programme Infrastructure and Environment (OPIE) Operational Programme Smart Growth (OPSG)
Domestic funding	the GEKON –Environmental Concept Generator program the EUREKA initiative GreenEvo Green Technology Accelerator initiative
Funds provided by financial sector organizations	Loans such as BOŚ loans under the *Energia na Plus* program, the "Loan for technological innovation" program Loans from the Environmental Protection Fund
Private equity funding	Venture capital Public-private mechanisms involving equity funds such as BridgeVC Business angels Crowdfunding, crowdsourcing

9. Conclusions

An overview of scientific literature and key documents suggests the following conclusions:

- Research, development and deployment spending in the field of eco-innovation in Poland remains below the level that guarantees the related growth and effective utilization of the existing opportunities.
- The primary objective of the national policy on environment is to increase "research and development spending in the fields of environmental protection and the deployment of eco-innovation in industry as a precondition for the success of the policy on environment, as projects of this kind are currently greatly underinvested" (State

Policy on Environment in 2009-2012 with a view to 2016) (Ministry of Environment, 2008).

- The equity gap is one of the highest barriers to the development of Polish entrepreneurship and to the implementation of development projects, not only with respect to eco-innovation (Szulczewska-Remi, 2014). As a consequence, it is critical to adopt new intervention instruments.
- The plans to increase eco-innovation spending enshrined in Polish and European strategic documents for the coming years do provide financing options. Nevertheless, some authors believe that a more serious weakness of the public administration lies in its misunderstanding of the essence of eco-innovation. As a result, Poland has not been utilizing the full potential of EU financing to stimulate its eco-innovation (Szpor & Śniegocki, 2012, p.18).
- The key eco-innovation financing mechanisms are EU funds extended to the member states of the European Union as well as the EU funds distributed in Poland in the new financial perspective 2014-2020, domestic funding and funding provided by financial institutions.
- In addition to financial instruments in the form of donations and loans granted on preferential or market terms, other significant potential sources of eco-innovation financing are available in the form of private equity funding, particularly for financing the early stages of eco-innovative investment projects.
- The huge potential for developing eco-innovation in Poland, especially in the energy and environment fields, may turn out to be pivotal for boosting the competitiveness of the Polish economy. It may, therefore, become possible to "promote an economy that is more resource efficient, more competitive and more environmentally friendly" (Commission Communication Europe 2020, 2010).

References

Baygan, G., & Freudenberg, M. (2000). *The International of Venture Capital Activity in OECD Countries: Implication for Measurement and Policy,* OECD Working Papers, Paris.

Berger, R., (2016). *European Private Equity Outlook* Retrieved from https://www.rolandberger.com/ja/Publications/pub_european_private_equity_mf.html

Borucka, B., & Foltynowicz, Z. (2010). Ekoinnowacje w OECD. In: Z. Kłos (Ed.). *Innowacyjność i jakość – wyznaczniki sukcesu* (pp. 19-24). Poznań: Wydawnictwo PP – Instytut Maszyn Roboczych i Pojazdów Samochodowych (Institute of Machines and Motor Vehicles).

Brzozowska, K. (2008). *Business angels na rynku kapitałowym. Motywowanie, inwestowanie, efekty.* Warszawa: Wydawnictwo CeDeWu Sp. z o.o.

Central Europe 2020 Cooperation Programme. (2014). Retrieved from http://www.interreg-central.eu

Chesbrough, H.W. (2006). *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Harvard Business Press.

Chrzanowski, M., & Dziedzic, S. (2014). Crowdfunding nowym sposobem finansowania innowacyjnych projektów. *Modern Management Review*, *20*(2), 7-16.

Council of Ministers (2014*). Energy security and the environment strategy – 2020 perspective.* Retrieved from www.mg.gov.pl/files/upload/20531/2014-04-15_BEiS_%20przyjety_przez_RM.pdf

Dziawgo, L. (2010). *Zielony rynek finansowy. Ekologiczna ewolucja rynku finansowego*. Warszawa: PWE.

Eco-Innovation Observatory Pro Inno Europe. (2014). *Ekoinnowacje w Polsce*. Brussels: European Commission.

European Economic and Social Committee. (2012). Opinion of the European Economic and Social Committee on the *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Innovation for a Sustainable Future – The Eco-innovation Action Plan (Eco-AP).* Retrieved from http://www.ine-isd.org.pl/theme/UploadFiles/File/ekes/zrownowazona_przyszlosc.pdf

Fałat-Kiljańśka, I. (2014). *Private equity. Więcej niż kapitał*. Warszawa: DeDeWu Sp. z o.o.

Faria, A.P., & Barbosa, N. (2014). Does venture capital really foster innovation?. *Economics Letter*, *122*, 129–131.

Fast Track for Innovation in the Horizon 2020 Work Programme. (2016). Retrieved from https://ec.europa.eu/programmes/horizon2020/en/h2020-section/fast-track-innovation-pilot

Fiedor, B. (2002). Ogólna charakterystyka ekonomicznej teorii środowiska (ujęcie neoklasyczne). In: B. Fiedor (Ed.). *Podstawy ekonomii środowiska i zasobów naturalnych* (pp. 33-46). Warszawa: C.H&Beck.

Foltynowicz, Z. (2009). Ekoinnowacje w Programach Unii Europejskiej. *Zeszyty Naukowe UEP, 131*, 122-134.

Foundation for the Environment. (2010). *Problemy oddziaływania małych i średnich przedsiębiorstw na środowisko.* Warszawa: Fundacja Partnerstwo dla Środowiska.

Gabryś, M. (2011). Bankowe źródła finansowania ochrony środowiska. In: *Ekologiczne uwarunkowania rozwoju gospodarki oraz przedsiębiorstw.* Kraków: University of Economics.

Godlewska, J. (2014). Możliwości finansowania działań z zakresu zielonej gospodarki w latach 2014-2020 na przykładzie województwa podlaskiego. *Economics and Management*, *4*, 206-216.

Groh, A., Liechtenstenstein, H., Lieser, K., & Biesinger, M. (2014). *The Venture Capital & PrivatevEquity Country Attractiveness Index*,

University of Navarra, Emlyon Buisness School, EY. Retrieved from http://blog.iese.edu/vcpeindex/

Grodzicka-Kozak, D., & Wojtach, W. (2013). *Rozwój systemu wsparcia ekoinnowacji szansą dalszego zrównoważonego rozwoju Polski.* Retrieved from http:// file:/// C:/Users/Ola/Downloads/ekoinnowacje-publikacja%20(3).pdf

INTERREG Europa 2014-2020. (2016). Retrieved from http://www.interregeurope.eu/

Janik, A. (2015). Koszty opracowania i wdrożenia ekoinowacji oraz źródła ich finansowania. In: *Innowacje w Zarządzaniu i Inżynierii Produkcji.* PTZP. Retrieved from http://www.ptzp.org.pl/files/konferencje/kzz/artyk_pdf_2015/T1/t1_0445.pdf

Jones, E., Harrisom D., & McLaren, J. (2001). Managing creative eco-innovation, structuring outputs from eco-innovation project. *The Journal of Sustainable Product Design*, *1*, 27-39.

KPMG. (2014). *Rynek Private Equity w Polsce: fakty a opinie.* KPMG. Retrieved from https://www.kpmg.com/PL/pl/IssuesAndInsights/ArticlesPublications/Documents/2014/Rynek-Private-Equity-w-Polsce-fakty-a-opinie-2014-KPMG-w-Polsce.pdf

KPKPB UE, (2008). National Contact Point for EU Research Programmes. Institute of Basic Technological Problems of the Polish Academy of Sciences. *Ekoinnowacja. Co to jest?* Retrieved from http://cip.gov.pl/container/EIP_ip/ekoinnowacje.pdf

LIFE financial instruments, (2016). Retrieved from http://ec.europa.eu/environment/ life/funding/financial_instruments/index.htm

Lipińska, D. (2013). Wsparcie ekoinnowacji na poziomie UE – wybrane instrumenty instytucjonalne i finansowe. In: L. Woźniak, A. Kanabrocka, & M. Hejduk (Eds.). *Ekoinnowacje w Polsce.* Kielce*:* Grono Targowe Kielce Chamber of Commerce.

Lisiński, M. (2016). Metody naukowe w metodologii nauk o zarządzaniu. *Przegląd Organizacji*, *4*, 11-19.

Malhotra, N., & Birks, D. (2007). *Marketing research. An applied approach*. Essex: Pearson Education Limited.

Mazur-Wierzbicka, E. (2014). Stan zaawansowania Polski we wdrażaniu ekoinnowacji na tle krajów Unii Europejskiej – analiza komparatywna. *Handel Wewnętrzny, 5*(352), 149-162.

Mid-Term Country Development Policy 2020 for Poland. (2012). Retrieved from https://www.mr.gov.pl/media/3336/Strategia_Rozwoju_Kraju_2020.pdf

Mikołajczyk, B., & Krawczyk M. (2007). *Aniołowie biznesu w sektorze MSP*. Warsaw: Difin.

Ministry of Environment. (2008a). *Analiza możliwości finansowania przez przedsiębiorstwa działań zmierzających do rozwiązania w nich problemu urządzeń zawierających PCB.* Retrieved from https://www.mos.gov.pl/fileadmin/user_upload/odpady/Analiza_ mozliwosci_finansowania_dzialan_dla_rozwiazania_problemu_pcb.pdf

Ministry of Environment. (2008b). *Polityka Ekologiczna Państwa w latach 2009-2012 z perspektywą do roku 2016.* Retrieved from https://www.mos.gov.pl/g2/big/2009_11/8183a2c86f4d7e2cdf8c3572 bdba0bc6.pdf

Ministry of Environment. (2015). *Greenevo.* Retrieved from http://greenevo.gov.pl/wp-content/uploads/2014/07/GreenEvo-2015_broszura-PL_net.pdf.

NCfR&D. (2012). *BRIdge VC – Public-private support for R&D commercialization, in partnership with capital funds*. Retrieved from http://www.ncbir.pl/en/domestic-programmes/bridge-vc/

NCfR&D, NFEPMW. (2013). *GEKON – Environmental Concept Generator*. Retrieved from file:///C:/Users/KCAFiW2/Downloads/opis_programu_gekon_28.02.2013.pdf

NCfR&D. (2016). *Rules for the funding by the National Centre for Research and Development of projects carried out by the EUREKA Initiative*. Retrieved from http://www.ncbir.pl/gfx/ncbir/userfiles/_public/programy_miedzynarodowe/eureka-eurostar/eureka_2016/eureka_zasady.pdf

NFEPMW. (2013), *Action Strategy of the National Fund for Environmental Protection and Water Management for 2013–2016 with a view to 2020*. Retrieved from www.nfosigw.gov.pl/en/nfepwm/strategy/

OECD. (2009). Eco-Innovation in Industry: Enabling Green Growth. Retrieved from *http://www.oecd.org/document/34/0,3343, en_2649_34173_44416162_1_1_1_1,00.html*

OPIE. (2014) *Operational Programme Infrastructure and Environment 2014-2020.* Ministry of Infrastructure and Development. Retrieved from http://ec.europa.eu/regional_policy/en/atlas/programmes/2007-2013/poland/operational-programme-infrastructure-and-environment

Operational Programme Smart Growth 2014-2020 (version agreed with the European Commission). Ministry of Infrastructure and Development, January 2015. Retrieved from https://rio.jrc.ec.europa.eu/en/library/operational-programme-smart-growth-2014-2020

Oslo Manual. (2008). *Guidelines for collecting and interpreting innovation data. The measurement of Scientific and Technological Activities.* Warsaw.

Osuch-Rak, E., & Proczek M. (2014). Kierunki rozwoju systemu finansowania ekoinnowacji w Polsce – perspektywa na lata 2014-2020. *Studia Ecologiae et Bioethiae UKSW, 12*(2), 83-104.

Ozdoba, J. (2015). Ekoinnowacyjość polskiej gospodarki. Proceedings from the conference *Innowacje w Zarządzaniu i Inżynierii Produkcji.* PTZP, Retrieved from http://www.ptzp.org.pl/files/konferencje/kzz/artyk_pdf_2015/T1/t1_0151.pdf

Problems of the environmental impact of small and medium-sized businesses. Summary of a 2010 survey (2010). Zakopane: Fundacja Partnerstwo dla Środowiska Program Czysty Biznes.

Programme for Central Europe. (2016). Retrieved from https://europasrodkowa.gov.pl/

Przybylska-Kapuścińska, W., & Mozalewki, M. (2011). *Kapitał wysokiego ryzyka*, Warsaw: Polskie Wydawnictwo Ekonomiczne.

PSiK, (2014). *Dla kogo PE/VC? Polskie Stowarzyszenie Inwestorów Kapitałowych.* Retrieved from http://www.psik.org.pl/

Rosa, A. (2008). Venture Capital w Polsce. *Zeszyty Naukowe Wydziału Nauk Ekonomicznych Politechniki Koszalińskiej, 12*, 133-143.

Regulation (EU) No. 1293/2013 of the European Parliament and of the Council on the establishment of a Programme for the Environment and Climate Action (LIFE) and repealing Regulation (EC) No. 614/2007 (Dz. U. UE, L 347/185 of 20.12.2013).

Regulation (EU) No. 1299/2013 of the European Parliament and of the Council of 17 December 2013 on specific provisions for the support from the European Regional Development Fund to the European territorial cooperation goal.

Ryszko, A. (2014). Motywacje i bariery działalności ekoinnowacyjnej przedsiębiorstw w Polsce. *Modern Management Review, 12*(21), 127-138.

Smolorz, B. (2011). Finansowanie ekoinnowacji kapitałem zwrotnym i bezzwrotnym w mikro, małych i średnich przedsiębiorstwach. In: Z.E. Zieliński. (Ed.). *Rola informatyki w naukach ekonomicznych i społecznych. Innowacje i implikacje interdyscyplinarne*. Kielce: Wydawnictwo Wyższej Szkoły Handlowej.

Sobańska-Helman, K., & Sieradzan, P. (2004). *Inwestycje private equity/venture capital.* Warsaw: Key Text.

Szpor, A, & Śniegocki, A. (2012). *Ekoinnowacje w Polsce. Stan obecny, bariery rozwoju, możliwości wsparcia.* Warsaw: Instytut Badań Strukturalnych (Structural Research Institute).

Szulczewska-Remi, A. (2014). Fundusze venture capital, jako wsparcie kapitałowe dla innowacyjnej przedsiębiorczości. In: M. Jasieński. (Ed.). *Innowatyka – nowy horyzont. Innowacyjność naukowców, przedsiębiorców, menedżerów i urzędników* (pp. 73-82). Nowy Sącz: Wyższa Szkoła Biznesu – National Louis University.

The Gallup Organization. (2011). *Attitudes of European entrepreneurs towards eco-innovation.* Analytical report (pp.22-52). Flash Eurobarometer *315.*

The SME Instrument in the Horizon 2020 Work Programme. (2016). Retrieved from http://ec.europa.eu/programmes/horizon2020/en/area/smes

Wielgórka, D. (2013). Innovative Ecological Activities in Small and Medium-Sized Enterprises in Poland – Sources of Financing. *Annual Set – Environmental Protection 15*, 606-620.

Woźniak, L., Trinks, R., & Bącal, W. (2004). Ekoinnowacje – nowy paradygmat, odmienna gospodarka, proekologiczna świadomość przedsiębiorców. In: A. Kaleta, K., Moszkowicz, & L. Woźniak, (Eds.). *Przedsiębiorczość i innowacyjność małych i średnich przedsiębiorstw*

– *wyzwania współczesności* (pp.683-688). Wrocław University of Economics.
Woźniak, L., Dziedzic, S., & Chrzanowski, M. (2014). Crowdsourcing narzędziem wzrostu potencjału innowacyjnego przedsiębiorstw oraz wzrostu sprzyjającego włączeniu społecznemu. *Scholarly Papers of the Wrocław University of Economics*, *337*, 88-95.
Wyrwa, D. (2010). Możliwości finansowania ekoinnowacyjności przedsiębiorstw sektora MŚP. In: L. Woźniak, L. Strojny, & E. Wojnicka. (Eds.). *Ekoinnowacje w praktyce funkcjonowania MŚP* (pp. 148 -170). Warsaw: Polish Agency for Entrepreneurship Development.
Ziółkowski, B. (2008). Znaczenie ekoinnowacji dla rozwoju przedsiębiorstw. In: A. Graczyk. (Ed.). *Zrównoważony rozwój w teorii ekonomii i w praktyce.* Scholarly papers of the Wrocław University of Economics, *1190*, 526-534.
Zuzek, D.K. (2015). Determinanty rozwoju ekoinnowacji w sektorze MSP na przykładzie województwa małopolskiego. *Roczniki naukowe Stowarzyszenia Ekonomistów Rolnictwa i Agrobiznesu, 17*(1), 240-244.
Żyła, A. (2014). *Dostępne instrumenty bankowe służące rozwojowi OZE w Polsce*. Retrieved from http://ahk.pl/fileadmin/ahk_polen/Erneuerbare_Energien/2014_06_11_BOS _Anna_Zyla.pdf

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BEHAVIORAL FINANCE – THE MANAGER'S PAY AND THE INCREASE IN THE VALUE OF A COMPANY

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Abstract
This article analyses the influence of the compensation model on the managers' actions, which is related to the increase in the value of companies in the long term. The aim, however, is to highlight the need to consider also behavioral paradigm by researchers and shareholders. The following paper presents both a prospect theory proposed by Daniel Kahneman and Amos Tversky and possible application of this approach to the analysis of the managerial pay, as well as a review of research into this field carried out in recent years.
Keywords: *the structure of remuneration, behavioral finance, prospect theory, behavioral corporate finance, behavioral paradigm.*

1. Introduction – anomalies in neoclassical finance paradigm

Before analyzing how the structure of remuneration affects the manager's decisions regarding behavioral finance, it is necessary to explain fundamental premises of this paradigm, and indicate differences existing between this paradigm and neoclassical economics. Generally speaking, modern finance is based on two interrelated ideas: market efficiency and the concept of the rational man. Currently, this approach is a mainstream academic finance approach (Zielonka, 2003, p. 8), and is also the basis of finance models in the neoclassical paradigm (Gajdka, 2013, p. 20, as cited in Czekaj, Woś & Żarnowski, 2001; Buczek, 2005). Economists and financiers assume, according to the market efficiency premise, that the responses of investors to any incoming information are immediately reflected in stock prices (Zielonka, 2003, p. 6). While seeking to maximize utility, economic agents interpret this information thoroughly and behave in a rational way (Gajdka, 2013, p. 19; Zielonka, 2003, p. 6). Such a vision of human nature resulted, on the one hand, in the possibility of building economic models, but on the other hand – in the axiomatisation of human behaviozr, which is contested more and more often (Giza, 2014, p. 46). The well-known *homo economicus*

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model seems to be poor as far as the analysis of the dynamics of economic agents' psycho-social characteristics is concerned and therefore does not provide accurate data (Dudziak, 2013, p. 25). In relation to the neoclassical theory, some fundamental questions are put forward. Firstly: Are the markets really effective? Secondly: Do economic agents actually behave in a rational way (Zielonka, 2003, p. 11; Szyszka, 2009, p. 6)? If a phenomenon does not meet the premises of traditional finance, they are considered as the so-called "anomalies" (Mielcarek, 2014, p. 28-29). T.S. Kuhn notes that "*anomalies are revealed only when referred to paradigms. The tighter and more general paradigm is, the more sensitive indicator of anomalies it becomes*"(Kuhn, 2001, p. 122-123). One of the examples is *the subprime* crisis (2008-2010) when the phenomena difficult to explain basing on the neoclassical paradigm were actually accumulated. In fact, it showed that the behavioral "weaknesses" are not only characteristic of economic agents, but also of those who were supposed to support market processes (credit rating agencies) and market regulators (central banks, financial supervision institutions, etc). (Cone, 2009 p. 6). In this context, it seems particularly important to determine the scope of what is called an anomaly on financial markets, and the real motivation of economic agents. Even if this reflection does not help to bring above-average returns, it will certainly facilitate to avoid losses (Pera, 2013, p. 411). It is worth noting that many results considered as anomalies on the basis of the efficient market premise disappear when a methodology different from the one producing the results is applied (Gajdka, 2013, p. 188). Paradoxically, therefore, the recent crisis had an impact on the development of economic sciences in the sense that it prompted the researchers to draw attention to the possibility of an interdisciplinary approach to the analysis of the market. Thus starting to research into such domains as behavioral finance, neuroeconomics, or psychological economics (Walczak, 2014, p. 58). This was partly because explaining these phenomena on the basis of mainstream research was nearly impossible (Zielonka, 2003, p. 15).

Due to the fact that behavioral finance is based on entirely different and sometimes opposing premises than the neoclassical finance, it, therefore, offers an alternative way of analyzing business processes. As it abandons the standard construct of *homo economicus* and accepts the imperfectness of the human mind, it describes the activities of both individual and professional economic agents with psycho-social flaws (Cone, 2009, p. 6). Numerous studies have proved that deviations from rationality can no longer be considered only as anomalies, but as a widespread phenomenon. Therefore, the essence of behavioral finance is an attempt to find the real mechanisms responsible for the economic agents' motivation and decision-making. The behavioral paradigm can be seen as an attempt to build a theory that takes

into account psycho-social agents, which previously were considered as "anomalies" (Graczyk, 2002, p. 19).

2. The essence of behavioral finance

It must be noted that what is today called behavioral economics or behavioral finance has been developing since the very beginning of economics. The starting point for Adam Smith was actually the analysis of human nature and the search for answers to the question about what guides man in the economic life (Giza, 2014, p. 47). However, it was Herbert Simon that was the first person to question the concept openly of the rationality of human nature in the 1950s. He proposed the theory of bounded rationality[2], which was an alternative to the then binding Morgenstern and Neumann's theory. However, the most intellectual conception of man and his activities regarding financial actions was proposed by Daniel Kahneman and Amos Tversky in their *Prospect Theory* (Kahneman & Tversky, 1979). This theory takes into account empirical data associated with the decision-making under uncertainty, thus indicating that human behavior is not consistent with the model of expected utility (Zielonka, 2003, p. 23).

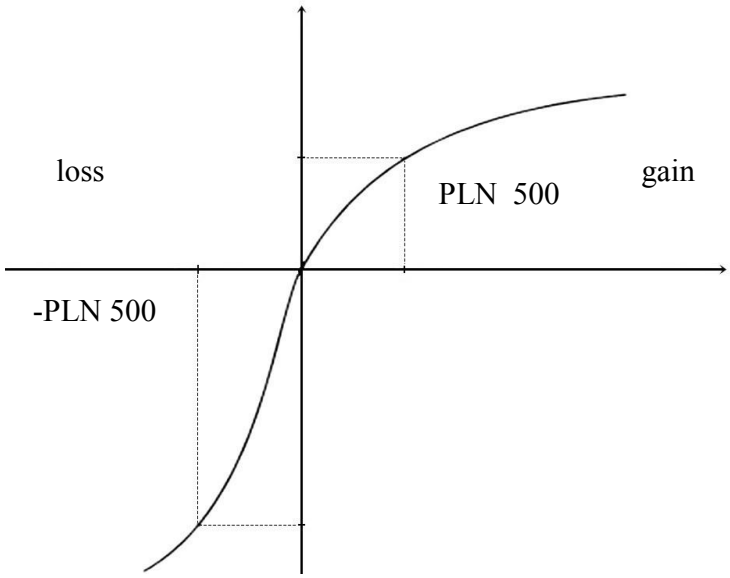

Figure 1. The gains and losses function. The prospect theory

Source: Zielonka (2003, p. 22).

2 In his view, the achievement of full rationality by a human is not possible due to the limited information processing, insufficient amount of time, lack of knowledge about all the alternative decision-making possibilities and inadequate computing concepts (Kotlarek, 2014, p. 106–108, as cited in Simon, 1955).

The prospect theory (Figure 1), which is the reflected upon in this paper, consists of two parts. In the beginning, Kahneman and Tversky proposed replacing the function of expected utility with the function of value. The former function focused on the category of wealth (Zielonka, 2003, p. 23), while the latter also included losses, which seems to be fundamental for the theory itself. In the presented theory, profit and loss are not mirror images. The curve for gains is convex and less steep than the concave curve for losses, which is commonly explained by the following saying: "losses loom larger than gains" (Kahneman & Tversky, 1979, p. 279), (see Table 1). This difference reflects people's attitude to risk (Zielonka, 2003, p. 23). The prospect theory centers around loss aversion, and not around risk aversion, as it used to be considered widely (Martin, Gomez-Mejia & Wiseman, 2013, p. 453). Gains and losses are relative to a "neutral point of reference" which, according to the creators of the theory, corresponds mostly to the current state of human wealth. To understand the point of reference, it is crucial to take into account the fact that its location may be affected by the decision-making perspective (Kahneman & Tversky, 1979, p. 274). Kahneman and Tversky described this point as some kind of status quo, which precisely does not allow to define this element of the theory. It is absolutely crucial for the researchers on the structure of remuneration in the behavioral paradigm, as they try to answer the question of how managers define the point of reference, and, as a consequence, what they will regard as a loss and what as a gain. In the second part, the authors of the prospect theory focused on the problem of estimating the probability of events outcome and proposing subjective decision-making value function (Kraciuk, 2013, p. 373). Because, as the authors say, people have limited cognitive abilities under extreme circumstances, events of low probability are either ignored or overvalued (Kahneman & Tversky, 1979, p. 282-283), unlike events of high probability which usually remain undervalued (Kahneman & Tversky, 1992, p. 298). Therefore, human reactions form a matrix in which, depending on the context of a decision situation, either risk aversion or risk seeking is revealed.

Table 1. Risk attitude – prospect theory

	Gain	**Loss**
Medium and high probability values	Risk aversion	Risk seeking
Very low probability values	Risk seeking	Risk aversion

Source: Zielonka (2006, p. 87).

By incorporating psychological agents into the economic model of a human, it became possible to prove that it has only a limited rationality,

and the axioms of neoclassical concept were refuted and replaced by a new concept – the emotional human (Dudziak, 2013, p. 26).

3. The structure of a manager's salary in the behavioral paradigm

As standard economics is said to describe human behavior in an unrealistic manner, behavioral finance aims at finding alternative answers to the questions related to the functioning of the entities in the economic context (Solek, 2010, p. 24). This approach calls for a repeated reflection on three questions: who is the manager, what affects his motivation to work and how does his decision-making process look like?

The consequence of a shift in thinking about the capital market is a totally new way of reflection on the financial management of companies and corporate governance. The studies conducted in recent years have indicated that behavior is deviating from what is defined as a rational one, is a characteristic of not only ordinary economic agents but also of managers. The study carried out by Andriy Bodnaruk and Andrei Simonov in 2015 tried to answer the question whether finance experts make better investment decisions than non-experts. The subject of the analysis was the disposition effect, i.e. the mistake of too rapid selling off of shares whose prices are rising while keeping the shares whose prices are falling (Zielonka, 2005). Due to the fact that managers could have had greater knowledge (through professional relationships) about some investment funds than average economic agents. The researchers excluded them from managers' portfolio, and tested only those funds with which managers were not connected to in any way; it turned out that statistically there is not a discernible difference between the behavior of the control group (non-experts) and experimental one (managers). The risk diversification analysis yielded similar results. Managers showed a level of portfolio concentration similar to the group of non-experts, and therefore the Sharpe ratio of these two groups did not differ significantly. The researchers were not able to prove that managers are less prone to behavioral errors than "non-experts" (Bodnaruk & Simonov, 2015). Hersh Shefrin lists 3 groups of psychological inclinations, which managers are particularly burdened with: (1) systematic deducing errors (excessive optimism, overconfidence, selective perception, confirmation and illusion of control), (2) heuristics (representativeness heuristic, affect heuristic, availability heuristic, and anchoring heuristic), (3) the effect of presentation (framing heuristic)[3] (Gajdka, 2013, p. 36-37, as cited in Sherfin, 2007). Paying attention to these phenomena sheds new light on the issue of corporate governance, agency theory and constructing the optimal compensation model. In recent years, the issue of skillful planning

3 It should be noted that this division is not arbitrary in behavioural finance.

a compensation model has become more valued for two reasons. Firstly, it is a result of the abovementioned financial crisis. According to EU experts, inappropriate compensation model, which was used in many institutions, was one of the reasons for taking an excessive risk by the decision makers (Mikołajek-Gocejna & Podedworna-Tarnowska, 2013, p. 362).[4] Secondly, the appropriate compensation model is thought to be a key motivational agent for managers who not only would, using the language of agency theory, make the interests of agents and principals coincide but would also contribute to gain a competitive advantage. Therefore, both Polish and pan-European institutions pay attention to the issue of managers' pay. In 2009, the Commission Recommendation on remuneration policies in the financial services sector made companies implement the "reasonable remuneration policy", where bonuses are correlated with long-term objectives of the company (Klepczarek, 2014, p. 170). A year later, the European Parliament issued a Directive (2010), as a result of which the Polish Financial Supervision Authority introduced an obligation to pay a minimum of 50% of the variable remuneration in shares or other financial instruments, as well as the distribution of bonus payments (at least of 40%) in the period from 3 to 5 years (Polish Financial Supervision Authority [PFSA], 2011). One of the points of Stock Exchange Best Practices of 2016 (2016, VI.Z.2) reads as follows: "In order to link the remuneration of board members and executives with a company's long-term business and financial objectives, the period between options or other instruments connected to a company's shares granted under the incentive program and the possibility of their exercising should be at least 2 years" (Stock Exchange Best Practices, 2016, VI.Z.2). Similarly, the government's proposed amendment to the so-called "Public Sector Salary Cap Act" stresses the need to optimise the compensation model, in which variable remuneration of the managers from state-owned companies should be established at a level from 50% to 100% of fixed remuneration (Ministry of Treasury Republic of Poland (MOT), 2016).

4. Managers' compensation components and long-term actions

The compensation of managers can be divided into fixed and variable ones. Fixed compensation is the basis for payment, and stems from the very fact of being employed. The second type of compensation can depend on the internal indicators of the company (accounting ones) or external indicators

4 The managers' compensation model at Lehman Brothers was changed in in 2007. On the one hand, contrary to the bank policy, managers' remuneration was focused primarily on short-term goals. On the other hand, part of the remuneration such as "contingent shares" that would motivate managers to pursue long-term goals, was granted free of charge to managers (Klepczarek, 2014, p. 164). From the perspective of behavioural finance, this means that the bank did not try to put managers in the area of potential losses, which meant they did not have to demonstrate their loss aversion because every stock price higher than zero would be a gain.

(e.g. share prices). It is worth noting that the cited regulations concentrate on the payroll variables conditioned by external indicators. In this case, the manager may have to deal with two types of salaries, which differ in the level of liquidity, i.e., the possibility of converting the security for cash. If the compensation package includes shares, such a possibility is immediate, but in the case of stock options, it is deferred. From the point of view of a manager, compensation can be divided into two kinds of cash inflow: the certain and predictable, as well as uncertain and unpredictable ones. In the context of long-term action, such separation becomes particularly significant. Research and development projects, for example, have the following characteristics: high capital investment, long lead times, and agents' skills that are difficult to identify (Kisielnicki, 2013, p. 20-25). Therefore, the implementation of these projects can lead to an increase in the value of the company in the long term and gain a competitive advantage, but it is also burdened with high risk. Firstly, the financing of such activities could endanger the liquidity of the company (Woźniak, 2012, p. 221). Secondly, they are associated with uncertainty as to the expertise necessary to complete the project. Thirdly, the implementation time has an impact on the instability of internal and external parameters of the project (Kisielnicki, 2013, p. 86-89). In such a situation, the only predictable inflow into managers' private portfolio is their base pay. The studies conducted so far show that managers include in advance their not received, yet possible to count, base pay into their current wealth. Wiseman and Gomez-Mejia also show that the base pay is usually allocated by the manager for the expenses to maintain the current standard of living (e.g. current bills) (Wiseman & Gomez-Mejia, 1998, p. 140). However, it is not the case for the other remuneration components. It is assumed that variable remuneration as such should motivate managers to invest in the projects aimed at increasing the wealth of shareholders, due to the fact that they themselves will benefit from such actions (Sanders, 2003, p. 479). The additional deferred instrument of variable remuneration should be motivating manager to take action to increase the value of company shares in the long term (Woźniak, 2012, p. 213-214; Borkowska, 2012, p. 424). This is due to the fact that stock options are subject to a fixed (usually several years) redemption time, i.e. the exercise of options (Borkowska, 2012, p. 424). In connection with the subject of this article, the author considers the above as crucial.

Under the behavioral paradigm, the variable remuneration is regarded by managers as a "bonus". It is not possible, at least in theory, to predict shares price, so funds from cashing them are spent by managers on luxury goods like holidays, which are not necessary to maintain the standard of living (Wiseman & Gomez-Mejia, 1998, p. 140).

5. The impact of the variables related to a company on receiving incentives by managers in the long run

Adopting the manager's perspective, while analyzing the optimal compensation model, indicates two phenomena. Firstly, it seems that the natural reference point for managers will be the calculable base pay, which they should receive during the term of the contract. Therefore, loss aversion, a characteristic of prospect theory, should manifest itself in managers for fear of losing the base pay by being made redundant or when a company goes bankrupt. Secondly, the implementation of long-term projects, which are by definition burdened with high risk, provokes a conflict between generating "a gentle income stream," and taking risky actions by managers (Wiseman & Gomez-Mejia, 1998, p. 139). Not only will the former solution not provide the company with a significant increase in value in the long term and managers with additional income, but also it will reduce the likelihood of losing the base pay. The latter solution, in turn, can increase a company's value, and thus managers' income, but also worsen a company's liquidity or lead to the loss of managers' permanent source of income. Under this approach, the assumption about the positive effects of variable remuneration determined by share prices on the willingness of managers to undertake projects to raise the value of the company should be regarded as invalid. Both the creators of the prospect theory and today's researchers studying the remuneration according to the behavioral current pay attention primarily to the context of decision-making that affects the setting of the reference point of the manager's portfolio. It should also be noted that a large role in receiving incentives is played by managers themselves. Therefore, in the context of the influence of remuneration on managers' actions to increase the value of the company, the author of this paper proposes to review both the business operation variables (profitability, availability of financial resources, industry) and those linked to managers' personality (disposition, seniority).

In 2003, Greve conducted a study to verify the applicability of the behavioral theory to R&D spending. The studies validated two hypotheses: (1) the relatively lower company's performance to managers' aspirations, the more intensive company's R&D action; (2) the relatively higher company's performance When the performance of the company to the aspiration level, the lower rate of starting R&D actions. In this case, the point below which the results will be considered a failure is called "the aspiration level" (Greve, 2003, p. 686, as cited in March & Simon, 1958). Also, defined as "the smallest satisfactory result in the decision maker's opinion" (Schneider, 1992, p. 1053). The interpretation of the results is consistent with the predictions of the prospect theory. Poor performance increases tolerance for risk-taking because

managers consider profit below their level of aspiration as a loss. Therefore, to avoid it, they are willing to take risky actions (Kahneman & Tversky, 1979). However, the Wu and Tu researchers received quite different results when they included the variable of stock options as a form of remuneration in their study. The hypothesis, validated, later on, was as follows: compensation in the form of stock options will play a positive role in spending on research and development activities when business performance is high than when it is low (Wu & Tu, 2007).

Hence, the relationship between the deferred variable remuneration and the willingness to undertake long-term innovation projects by managers is moderated by business performance (see Figure 2), which affects the perception of managers and their decision-making process. When business performance is poor, managers may feel forced to seek immediate solutions to the situation. Therefore, they focus on short-term actions. In this context, the potential loss is significant, as managers may lose income already included in their standard of living if the trend remains negative. Numerous researchers (Wu & Tu, 2007; Martin et al., 2013) also indicate that even unsold shares carry a potential loss represented by their current price. Thus, the poor financial situation of the company is correlated with managers' income in two ways: by the said possible loss of the base pay and by the decrease in the shares or options prices.

Therefore, only when the performance is at a high level and the company has accumulated available funds[5], can the manager focus on the potential benefits associated with an increase in the shares price in the long term. In such a situation, granting managers a large portfolio of stock options can bring the expected results (Wu & Tu, 2007). The situation is complicated, however, if we consider the company's business activity. The increase in the value of the company, also in the long term, does not necessarily make managers motivated to start projects with a several-year deadline. In the technology business, works on innovative solutions that help to achieve competitive advantage can be regarded as permanent and critical ones for assessing the success of the manager. The study carried out by American researchers (Balkin, Markman & Gomez-Mejia; 2000) showed that technology companies prefer to reward their managers with shares than stock options, which means that they are put in the situation which relatively quickly may lead to a loss for them. If we refer to the Wu and Tu's studies, it may mean that the manager should be motivated to short-term action because the value of both the base pay and shares is endangered.

5 Interestingly, the study did not show statistical significance for the relationship between the available funds of the company and undertaking research and development investment by managers (Wu & Tu, 2007).

6. The impact of the variables focused on managers on their reception of incentives in the long term

Unfortunately, research on the impact of the compensation model on managers' decision-making despite taking into account external variables, i.e. in the corporate context, cannot be considered as complete, and the completion of the analysis at this level as satisfactory. Managers themselves are also crucial – their seniority and disposition, which is the most difficult to grasp by financiers.

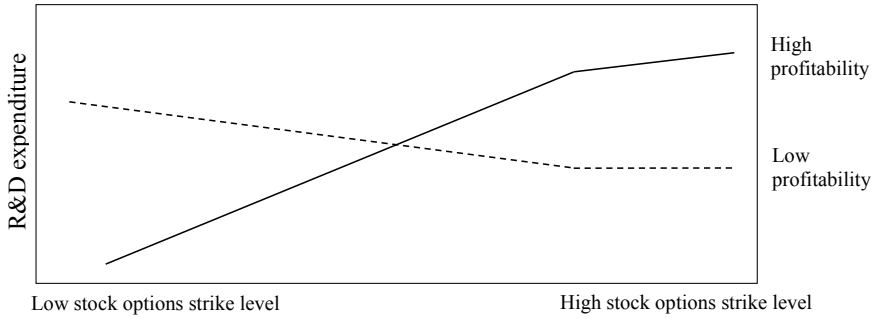

Figure 2. Moderating role of the company's performance
Source: Wu & Tu (2007, p. 488).

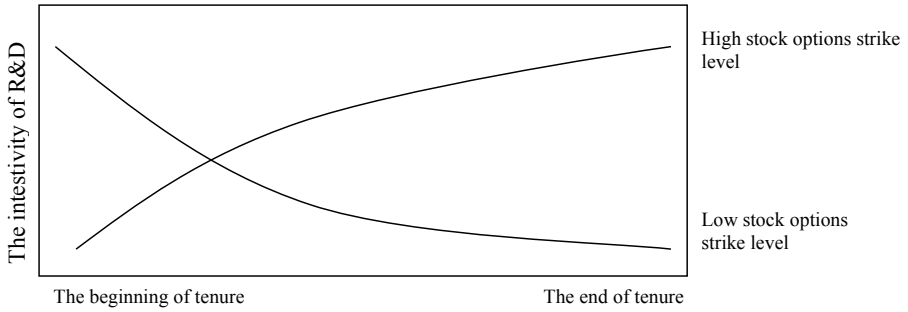

Figure 3. The manager tenure and his pay juxtaposed with R & D activities
Source: Zona (2016, p. 571).

In 2016, Zona conducted a research, which yielded two conclusions. Firstly, the stage of managers' tenure significantly affects the impact of the remuneration on their taking risky actions (Figure 3). Secondly, the remuneration stimulates managers' actions differently in the initial and the final stage of their tenure. Zona showed that if the managerial compensation

model was complemented by a relatively large number of stock options, the intensity of a company's research and development investment will increase, but will decrease in the final stage of the phenomenon. However, while analyzing actions from the beginning of the tenure at the same options strike level, the reverse effect was observed.

Paradoxically, the greater intensity of research and development was at those companies whose managers were given a relatively small number of stock options at the beginning of their tenure. Similarly, a large share of stock options in the general remuneration of novice managers decreased the intensity of their research and development investments (Zona, 2016, p. 571). To explain this mechanism, it is necessary to refer to the problem of the reference point again and to how managers can define a loss at the beginning and, at the end of their tenure. According to the author's research, managers can take the expectations of shareholders as the reference point at the beginning of the tenure. Therefore, if the remuneration is based on the external financial indicators, managers feel that it is expected from them to increase the company's value as a result of their actions. However, due to the fact that they are at a potential loss at the beginning of the tenure because they have included the future remuneration in the current wealth) (Wiseman & Gomez-Mejia, 1998, p. 140), it can be assumed that they will be more willing to choose a short-term risk. By doing so, they will demonstrate their ability to meet the shareholders' expectations, thus averting the possibility of being dismissed. However, the later stage of the tenure is, the smaller potential losses are. Then, managers' deferred pay can fulfil their function (Zona, 2016, pp. 562-563). Nevertheless, what must not be neglected is the fact that the exercising of stock options becomes more and more real in the final stage of the tenure, which undoubtedly can be considered as a major stimulator of managers' behavior.

It is worth considering, though, whether the level of the individual compensation elements is objective. In 2014, Clemens Otto conducted a study on the influence of managers' optimism on their compensation[6]. Using data on remuneration from American companies, he proved that the managers who are characterized by a higher level of optimism receive fewer stock options as part of their remuneration, lower bonuses and, consequently, lower overall remuneration than the managers without such a trait[7]. The optimistic CEO regards the positive performance of the company as more likely than in reality

6 It should be noted that the researcher focuses on optimism and not on overconfidence. This means that the study involves managers' belief in higher than real internal quality of their projects, and not overvaluing their forecasted results (Otto, 2014, p. 366).

7 Optimism was measured in two ways in this study. Firstly, the optimistic managers were thought to be those who kept the derivative shares to the very end, i.e. to the stock options maturity date. This meant they have positive beliefs about the development of the company. The second way was to compare the forecasted EPS indicators published by companies with their subsequent actual value. This is due to the assumption that the CEO affects the making of forecasts, and the public are often not given information that the CEO would firmly disagree (Otto, 2014, p. 369).

and therefore overestimates the value of compensation claims, which are related to the success of the company. Thus, he is willing to accept a smaller number of variable remuneration components, i.e. a smaller number of incentives. Then the author of this paper poses an open question as to what extent the psychological characteristics of the manager should be taken into consideration by business owners when hiring managers and structuring their compensation model.

4. Conclusions

The assumptions of the rationality of human nature and the efficiency of the market have become increasingly difficult to sustain recently. Dynamically developing behavioral finance allows for the analysis of this part of the phenomena and the behavior of economic agents, which previously were regarded only as anomalies. As a result, science opens itself to new sub-disciplines that shed a different light on the issues related to corporate governance or construction of the optimal managers' compensation model.

The study above results highlights two important issues in the context of corporate financial management. Firstly, managers' and other economic agents' decisions may be burdened with behavioral errors, which indicates the need to take into account in non-financial factors in their thinking. Secondly, the impact of variable remuneration components on the motivation of managers to undertake projects desired by shareholders is not clear. It can be stated quite firmly that the introduction of variable components determined by external indicators into managers' compensation, puts them in a situation of permanent conflict seen differently depending on such factors as the personality of the manager, tenure, the very decision-making situation and the company's situation (performance or business activity). The author of this paper also considers that it would be wrong to reject the incentive value of the analyzed forms of remuneration. It should be noted, however, that it is limited.

In Poland, according to the author's knowledge, there is no ongoing research in the behavioral paradigm on the impact of the compensation model for operations managers' operations in order to increase the value of the company in the long term. The analyses we can rely on come from other business specifics. Therefore, there is doubt as to the value of the application. Moreover, Polish research in the area of behavioral corporate finance is still preliminary, and it does not allow for drawing definitive conclusions (Gajdka, 2014, p. 203). Due to the fact that the incorrectly constructed managers' compensation model is given as one of the causes of the *subprime* crisis, and because as a result of which many Polish and European institutions create recommendations to which companies must or will have to adopt. It is

necessary to carry out analysis in the field, taking into account the nature and way of functioning of Polish enterprises and managers.

References

Balkin, D.B., Markman, G.D., & Gomez-Mejia, L.R. (2000). Is CEO Pay In High-Technology Firms Related To Innovation?. *Academy of management journal*, *43*(6), 1118-1129.

Bodnaruka, A., & Simonov, A. (2015). Do financial experts make better investment decisions?. *Journal of Financial Intermediation*, *24*, 514–536.

Borkowska S. (2012). *Skuteczne strategie wynagrodzeń – tworzenie i zastosowani*. Warsaw, Poland: Oficyna a Wolters Kluwer business.

Czekaj, J., Woś, M., & Żarnowski, J. (2001). Efektywność giełdowego rynku akcji w Polsce: Z perspektywy dziesięciolecia. Warsaw, Poland: Wydawnictwo Naukowe PWN.

Dobre Praktyki Spółek Notowanych na Giełdzie Papierów Wartościowych w Warszawie 2016. (2016, Styczeń 01). Retrieved from https://www.gpw.pl/dobre_praktyki_spolek_regulacje

Dudziak S. (2013). Ekonomia behawioralna – interdyscyplinarne podejście do zachowań ekonomicznych. *Studia I Prace Wydziału Nauk Ekonomicznych i Zarządzania*, *32*, 23- 36.

Dyrektywa Parlamentu Europejskiego i Rady 2010/76/UE z 24 listopada 2010 r. w sprawie zmiany Dyrektyw 2006/48/WE oraz 2006/49/WE w zakresie wymogów kapitałowych dotyczących portfela handlowego i resekurytyzacji oraz przeglądu nadzorczego polityki wynagrodzeń. (2010, Grudzień 14). Retrieved from http://eur-lex.europa.eu/legal-content/PL/TXT/?uri=CELEX%3A32010L0076

Gajdka J. (2013). *Behawioralne Finanse Przedsiębiorstw. Podstawowe Podejścia i Koncepcje*. Lodz, Poland: Wydawnictwo Uniwersytetu Łódzkiego.

Giza W. (2014). Normatywny wymiar koncepcji homo oeconomicus. *Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, *180*(1), 46-54.

Graczyk, A. (2009). Teoria perspektywy i hiperboliczna funkcja dyskonta – implikacje dla teorii konsumpcji. In: D. Kopycińska (Ed.), *Wybory konsumentów i przedsiębiorstw w teorii i praktyce* (pp. 19-27). Szczecin, Poland: Katedra Mikroekonomii Uniwersytetu Szczecińskiego.

Greve, H.R. (2003). A behavioral theory of R&D expenditures and innovations: evidence from shipbuilding. *Academy of Management Journal*, *46*(6), 685-702.

Kahneman, D., Tversky, A. (1992). Advances in Prospect Theory: Cumulative Representation of Uncertainty. *Journal of Risk and Uncertainty*, *5*(4), 297-323.

Kahneman, D., Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica, 47*(2), 263-292.
Kisielnicki, J. (2013). *Zarządzanie projektami badawczo-rozwojowymi*. Warsaw, Poland: Oficyna a Wolters Kluwer business.
Kotlarek, P. (2014). Racjonalność w ujęciu ekonomii behawioralnej. *Studia Ekonomiczne. Uniwersytet Ekonomiczny w Katowicach, 180*(1), 106-116.
Kraciuk, J. (2013). Kryzysy finansowe w świetle ekonomii behawioralnej. *Research Papers of Wrocław University of Economics*, *305*, 370-379.
Kuhn, T. S. (2001). *Struktura rewolucji naukowych*. Warsaw, Poland: Fundacja Aletheia.
March, J. G., & Simon, H. (1958). *Organizations*. New York, USA: Wiley.
Martin G., Gomez-Mejia L., & Wiseman R. (2013). Executive stock options as mixed gambles: revisiting the behavioral agency model. *Academy of Management Journal, 2*(56), 451-472.
Mielcarek, J. (2014). Istota nowego paradygmatu finansów. *Paradygmat finansowy w obliczu współczesnej ekonomii. Zeszyty Naukowe Wyższej Szkoły Bankowej w Poznaniu, 54*(3), 25-36.
Mikołajek-Gocejna, M., & Podedworna-Tarnowska, D. (2013). Wynagrodzenia menedżerów a kreacja wartości spółek. *Zeszyty Naukowe Uniwersytetu Przyrodniczo-Humanistycznego w Siedlcach, 98*(25), 353-371.
Pera, J. (2013). Wpływ teorii finansów behawioralnych na współczesne zarządzanie ryzykiem. *Zarządzanie i Finanse, 1*(4), 407-422.
Solek, A. (2010), Ekonomia behawioralna a ekonomia neoklasyczna. *Zeszyty Naukowe Polskiego Towarzystwa Ekonomicznego*, *8*, 21-34.
Sanders G. (2003). Behavioral responses of CEO's to stock ownership and stock option pay. *Academy of Management Journal*, *3*(44), 477-492.
Simon H.A. (1955). A Behavioral Model Of Rational Choice. *The Quarterly Journal of Economics*, *1*, 99-101.
Shefrin H. (2007). *Behavioral Corporate Finance. Decision that Create Value.* Boston, USA: McGraw Hill/Irwin.
Schneider, S. L. (1992). Framing and conflict: Aspiration level contingency, the status quo, and current theories of risky choice. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *18*, 1040–1057.
Szyszka, A. (2009). Behawioralne aspekty kryzysu finansowego. *Bank i Kredyt, 40*(4), 5–30.
Otto, C.A. (2014). CEO optimism and incentive compensation. *Journal of Financial Economics, 114*, 366–404.
Uchwała nr 258/2011. (2011, Październik 04). Retrieved from https://www.knf.gov.pl
Uchwała nr 259/2011 (2011, Październik 04). Retrieved from https://www.knf.gov.pl
Ustawa o zasadach kształtowania wynagrodzeń osób kierujących niektórymi spółkami. (2016, Czerwiec 09). Retrieved from http://orka.sejm.gov.pl/

Walczak, M. (2014). Neuroekonomia – w drodze do mainstreamu. In J. Ostaszewski & E. Kosycarz (Eds.), *Rozwój Nauki O Finansach. Stan Obecny i Pożądane Kierunki Jej Ewolucji.* (1st ed., pp. 57-70). Warsaw, Poland: Szkoła Główna Handlowa w Warszawie – Oficyna Wydawnicza.
Woźniak J. (2012). *Współczesne systemy motywacyjne. Teoria i praktyka*. Warsaw, Poland: Wydawnictwo Profesjonalne PWN.
Wiseman R., & Gomez-Mejia L. (1998). A behavioral agency model of managerial risk taking. *Academy of Management Beview*, *1*(23), 133-153.
Wu J., & Tu R. (2007). CEO stock option pay and R&D spending: a behavioral agency explanation. *Journal of Business Research*, *60*, 482-492.
Zalecenie Komisji Europejskiej z dnia 30 kwietnia 2009 r. w sprawie polityki wynagrodzeń w sektorze usług finansowych 2009/384/WE. (2009, Kwiecień 30). Retrieved from http://eur-lex.europa.eu/
Zielonka, P. (2003). Czym są finanse behawioralne, czyli krótkie wprowadzenie do psychologii rynków finansowych. *Materiały i Studia NBP, 158.*
Zielonka, P. (2005). Efekt dyspozycji a teoria perspektywy. *Decyzje, 3*, 55-77.
Zielonka, P. (2006). *Behawioralne aspekty inwestowania na rynku papierów wartościowych*. Warsaw, Poland: Wydawnictwo CeDeWu.
Zona F. (2016). Agency models in different stages of CEO tenure: The effects of stock options and board independence on R&D investment. *Research Policy*, *45*, 560–575.

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FINANCING THE COMPANY WITH PRIVATE EQUITY/VENTURE CAPITAL FUNDS

***Agnieszka Mazurek-Czarnecka*[1]**

Abstract
The following paper is concerned with the sources of funding companies that finance on their own thanks to the involvement of some external shares from venture capital funds. The aim of the paper is to present private equity/venture capital funds in financing the company.
Keywords: *financing the company, private equity, venture capital, venture capital funds.*

1. Introduction

The main goal of every enterprise is to provide its owners with biggest profits possible. Such a goal can be achieved only when a proper strategy for the development of the company has been developed. This strategy should determine improvement of company's selling potential and strengthen its position on the market. While carrying out the adopted strategy, the enterprise can use various sources of financing. In order to maintain and strengthen its position, the company constantly has implement more and more innovative projects. Their implementation requires high costs as well as taking the risk. Enterprises at early stages of development have the greatest difficulty in gaining capital. Lack of creditworthiness prevents them from getting a loan from the bank. Thus, micro- and small enterprises have to tackle with a financial gap which can be filled by private equity/venture capital funds, which in turn belong to company's external capital.

I attempt in this article to present the subject of financing the company with private equity/venture capital funds, and my field of research is private equity/venture capital market in Poland in 2007-2014. The size and structure of capital invested by private equity/venture capital funds have been analyzed. The article depicts sources of financing the companies. The essence of private equity/venture capital financing has been explained, and the development of private equity/venture capital market in Poland has been analyzed. The desk research method has been used. It consists of gathering, analyzing, verifying

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and consolidating data that come from various sources, such as the literature on this subject, academic magazines, the Internet, other scientific works and finally, statistical data compilations.

2. Sources of financing companies

Proper functioning and development of every undertaking depend on its financial resources as well as on its ability to obtain new ones from external sources. Discussions on this subject should probably begin with the division of financing according to balance sheet law, which classifies capital into one's own and the outside one (Directive from 1994).

Companies can use either internal or external sources of financing. Availability and type of sources of financing that are used by the company depend on its size, the aim of financing, the stage of its development and finally, on risk connected with running it (Sokół, 2015, pp. 125-126). Potential financing capacity is big and has been presented in Figure 1.

Nevertheless, one should take into consideration the fact that not all sources of financing are equally available and within reach of every company. The choice of a source of financing depends e.g. on macroeconomic factors (inflation, tax system, the level of interest rates) as well as on microeconomic ones (costs of capital using, time needed to obtain profit, financial risk, company's viability). All these factors have the influence on the decision which sources of financing to choose (Skowronek-Mielczarek, 2015, p. 153).

Because of high risk, access to external sources of funding is limited, especially for the enterprises at early stages of development. The stage of company's development has a direct influence on its potential and credibility in the eyes of prospective capital givers. When a company enters the next phase of development, its ability to obtain external capital grows. (Sokół, 2015, p. 127).

Sources of funding an enterprise can be divided according to how easily accessible they are (Lewicki, 2009, p. 4):

- **easily accessible:** own funds, credit guarantees, trade liabilities, budget allocations, EU funds, loans from family and friends,
- **harder to access:** loans and short- term bank credits, factoring, leasing, OTC issues,
- **difficult to access:** long- term bank credits, issue of bonds and shares, private equity/venture capital funds, franchising.

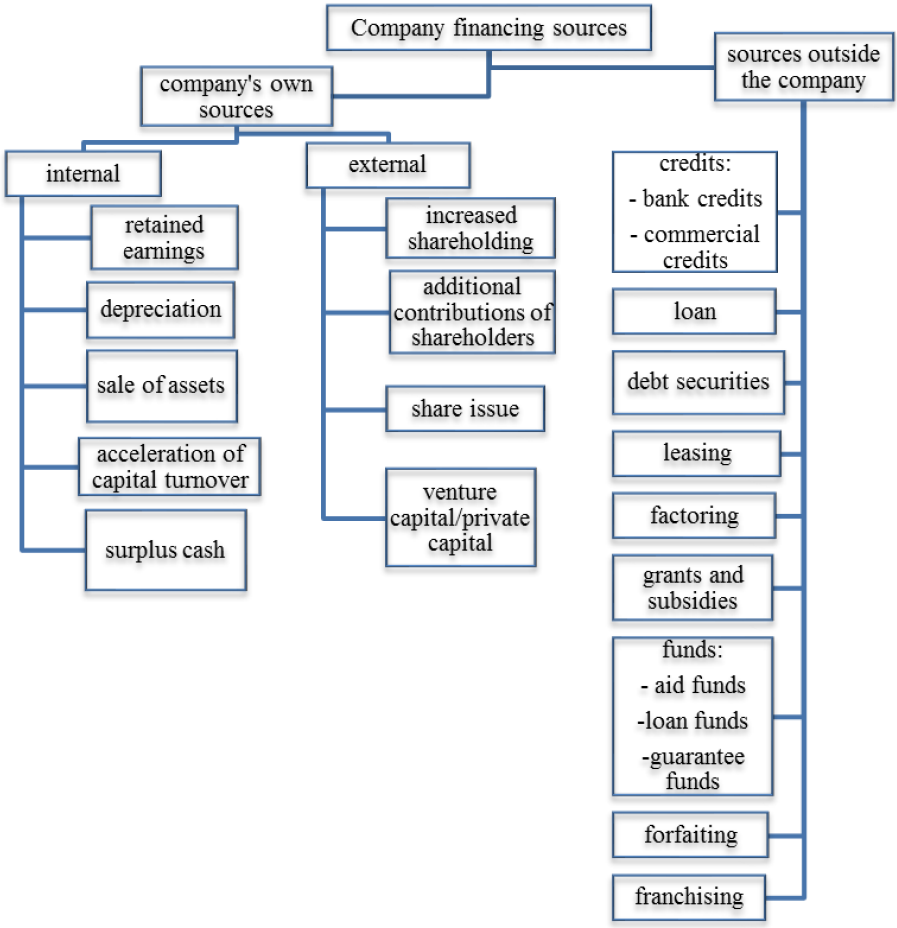

Figure 1. Sources of company's financing

Source: Own study based on Grzywacz. (2013); Duliniec, (2011); Rębilas, (2014); Skowronek-Mielczarek (2002).

As the company develops, lack of capital becomes more and more noticeable and becomes the company's top priority. According to the so-called **theory of financing sources hierarchy,** entrepreneurs firstly use retained earnings. Thus, they use their own capital in the first place and after that, they resort to external sources of funding, i.e. outside capital. External own sources are used as the last ones (Chojnacka, 2012, p. 66).

The funding of innovative enterprises is a capital- intensive process which requires the inclusion of external funding sources. The increase of company's own capital with the use of external financing can be achieved

through an increase in shares, another issue of shares or, finally, through the use of resources from venture capital market participants. To the last group belong private equity/venture capital funds (Krawczyk, 2012, p. 126).

Company's own external funding depends on its organizational and legal form which is strictly defined by law. Operations of the company that contributes to the increase or decrease of capital value are also strictly defined. Company's own capital can be increased thanks to their owner's donations, share issue, business angels, private equity/venture capital funds (Kołosowska, 2013, p. 55).

Summing up, financing the company with private equity/venture capital funds belongs to company's own external sources of funding that are hard to access. For small enterprises, the greatest burden of obtaining such financing is organizational- law form. I will develop this thought in paragraph 3.

3. The essence of private equity/venture capital financing

There are many definitions of private equity/venture capital funds in the literature. P. Gompers and J. Lerner define venture capital as a free resource of accumulated funds that enables supporting investments of companies characterized by the above-average potential for growth. Accumulated capital is managed by funds created especially for this purpose. (Gompers, 1999, p. 344). J. Ostrowski, in turn, defines this type of funds as an external source of company's medium- and long-term capital source that at the same time has financial-advisory functions that are characterized by high financial risk (Ostaszewski, 2003, p. 180). The definition acknowledged in Europe is the one by European Private Equity and Venture Capital Association (EVCA), which describes venture capital as a subset of private equity. According to this definition, venture capital is a part of private equity which comprises capital investments supporting seed (commencement of activity), start-up (early stage of development) and early stage (enterprise's expansion) (Annual Survey of Pan-European Private Equity & Venture Capital Activity 2005, p. 349).

The Polish Private Equity Association (PSIK) which is an institution composed of the biggest private equity funds that are on the Polish market, provides a similar definition of venture capital saying it is a form of private equity. According to PSIK, venture capital funds are invested in early stages of the firm's development, and thanks to them new units can be opened or expanded. Subjects which offer solutions like these expect a return from invested money that is as high as the risk they have taken offering this type of solution (www.psik.org.pl). Moreover, the author of the article claims that venture capital funds are a subset of private equity funds. This is why the term

private equity/venture capital funds are used when venture capital funds are mentioned.

It is worth pointing out that the investor is not only the giver of the capital but also cooperates with the enterprise in 4 basic areas (Ręblas, 2014, p. 167):

- private equity/venture capital fund monitors the current progress of investments (also, it monitors financial results of an enterprise),
- he participates in the management of the company (he participates in making strategic decisions),
- he cooperates on an ongoing basis in the field of enterprise development (provides know- how, establishes business contacts, subsidizes extra activities);
- he motivates the management staff.

Polish firms still do not make use of private equity/venture capital funds too often. This form of financing is popular with well-developed markets. Private equity/venture capital belongs to medium- and long-term commitment which later becomes of ownership nature. These funds most often exist on the private market and enable to gain above the average returns in time set by the investor (Sobańska & Sieradzan, 2004, p. 13). Private equity/venture capital funds (and, more precisely, unquoted equities and shares) managed professionally invest collected capital in securities of ownership nature. Shares are resold when the value of an enterprise increases as it guarantees profits from the capital invested. (Misiołek, 2011, p. 366).

External possibilities to gain company's own capital are not available for all enterprises, though. Companies of SME sector have limited access to such kind of funding. Limited- liability companies are in turn in an advantageous position when it comes to obtaining private equity/venture capital funds. Theoretically, it is possible to support civil- law partnerships with private equity/venture capital funds, yet, in practice it does not happen very often. It is because of the fact that a substantial number of SME companies are self-employment companies or partnerships. (Grzywacz, 2013, p. 24).

Private equity/venture capital funds function as (Kornasiewicz, 2004, p. 91-92; Górski, 2009, p. 271):

- independent enterprises which are not part of any holding company (enterprises like these manage one or a couple of funds),
- enterprises that manage resources from the public sector,
- enterprises that depend on insurance or pension companies,
- funds in the form of bank's subsidiaries and lending institutions;
- industrial corporations (often their main aim is to revise modern technologies).

As mentioned before, in the private literature equity tends to be identified with venture capital. Though, no matter how many similarities there are between these two investments, one should acknowledge that there is a clear distinction

between them. While private equity funds invest their capital in enterprises at different stages of development, venture capital funds are a part of private equity capital. Venture capital funds donate their resources to investments at early stages of development and expansion stages (Gabryelczyk, 2009, p. 197). Entrepreneurs who use high-risk funds, (and to those belong private equity/venture capital funds*)*, are supported not only by capital, but also they benefit from consulting as regards the following: law, administration, and marketing (Johan, Schweizer & Zhan, 2014, p. 145).

Financing the company with private equity/venture capital funds can be done, as already mentioned, at different stages of company's development. The earlier the stage of company's development is, the higher risk entailed. In terms of stages of development of the firm, one can include the following examples of private equity/venture capital financing: (Wrzesiński, 2006, pp. 132-139; Sobańska & Sieradzan, 2004, pp. 202-243):

Early-stage-financing

- ***seed capital*** (*seed stage financing*) **–** is the capital at an early stage of a firm's development. Financial resources are intended to cover the cost of research and development process, and they finance activities until the assumptions of services and products are prepared. Resources at this stage are not substantial, but the chance of obtaining profit is big. The resources are usually invested for 7-12 years, and they mainly come from venture capital funds.
- ***start-up capital (start-up-financing)*** **–** concerns initial stage of investment and covers the expenses of the investing process- mainly those of preparation of production. Companies use this type of capital to implement the main stages of investments which require most financial resources**.** This type of funding concerns mostly newly-emerged enterprises and innovative ideas. Most often private equity/ venture capital funds become engaged at this stage of company's development. Resources of this type are usually invested for 5-10 years.
- ***first-stage financing*** **–** is the financing of an early stage of an enterprise, mainly of bringing the product and services to the market, so firms focus mostly on building a strong position on the market that would enable them to expand further. Private equity/venture capital is involved for 2-5 years. It is also worth mentioning that at this stage the company has much easier access to other sources of financing. The demand for private equity/venture capital decreases.
- ***second- stage financing*** **–** is the financing of the enterprise's expansion on the market. The increase in production and sales on the local market, as well as activities aimed at gaining new selling places, are financed. Companies strive to increase their share on the

market and obtain leadership in the sales of goods and services. New sales networks are built, mergers and acquisitions take place. It is rare at this stage that a new private equity investor enters and most often the investor makes a decision to exit the investment. Nevertheless, if the decision to continue financing the expansion of the company is made, the capital is invested for 3-5 years.

- ***the exit of the investor from financial commitment- –*** this is the last stage of collaboration between private equity/venture capital and the enterprise. Exit from the investment can happen at every stage of investing and depends on others on investment assumptions, the enterprise's financial situation and the general situation on the market.

Also, it is worth pointing out that the divestment process depends mainly on the investment agreement. The investor can exit the investment in a few ways (Sobańska & Sieradzan, p. 122):

- purchase of shares by the owner,
- listing on the stock exchange,
- management buy out,
- sales of shares to chosen investors,
- liquidation of the undertaking.

Poor absorption of capital by SME sector, especially by the smallest companies, has become the most vital premise to use private equity/venture capital funds to finance the company's investments. Small undertakings do not have enough credit history check that would enable them to obtain credit from the bank. Their market position is often weak, too. Their demand for capital is, in turn, disproportionate to the size of their business, especially at its early stages (Bojańczyk, 2006, p. 72).

The shareholding character of support that is offered by private equity/venture capital funds raises concern and anxiety in its potential beneficiaries. One- man undertakings, especially those of commercial or service nature, will not make use of this sort of financing because of its organizational and legal form.

4. Private equity/venture capital market in Poland

The analysis of experiences of well-developed countries allows to draw conclusions that this method of financing the undertaking contributes to the acceleration of economic growth. Companies that used private equity/venture capital funds have reached significantly better financial results than their rivals which used traditional forms of support (Mikołajczyk, 2014, p. 48). None of the latter supports the company in such a complex way. It is also worth noticing that enterprises which use private equity/venture capital funds are

much less prone to turbulences on the market. Additionally, they go bankrupt very rarely which was proved during the last crisis. (Thomas, 2010).

The EU, after it has seen the equity gap, has taken measures to encourage governments of its member countries to create and develop private equity/ venture capital funds which support SME sector (Waniak-Michalak, 2015, p. 92). The EU policy that backs up financially private equity/venture capital funds has contributed to increased interest of entrepreneurs in this form of investment. According to data from Central and Eastern Europe Statistics, in 2013 in East and Central Europe venture capital funds obtained 48,3% subsidies from public funds. In 2014, in turn, they got 41,9% of their overall value (*Central and Eastern Europe Statistics,* 2015, p. 7).

In Poland, there were 39 private equity/venture capital fund managers in 2014 that are members of Polish Private Equity Association (PSIK). Both managers and funds used various legal forms of businesses, e.g. joint-stock company, limited liability company, limited joint-stock partnership and closed-end investment fund.

Private equity/venture capital investment market is relatively young in Poland (it began in 1990). It is also a small one, thus changes happening in a year do not reflect the activity of a fund in a long period of time because of the fact that those changes might be the result of single transactions.

A substantial fall in investments of private equity funds in domestic undertakings was noted in 2013. Their value decreased by 786 mln PLN in comparison to 2012. Also, in 2014 there was a drop in private equity funds' investments, although it was not as rapid as in the previous year as it amounted to 66 mln PLN. Table 1 presents the value of investments financed with private equity/venture capital funds in Poland in 2007-2014 as well as the number of undertakings which obtained financial support from domestic private equity/ venture capital funds.

According to data from Analysis of the National Bank of Poland (NBP) entitled – *Rozwój systemu finansowania w Polsce w 2014 (The Development of Financing System in Poland in 2014),* in 2011-2014 the value of financial resources obtained by the enterprises through the share issue on the markets organized via GPW- Główny Rynek GPW (Warsaw Stock Exchange) and NewConnect exceeded 25%. Domestic private equity funds that specialize in buy-outs gathered more than a half of collected resources. The remaining resources were gathered by the so- called venture capital balanced funds which invest in seed and start-up phases.

Table 1. Value of investments and financial resources obtained by private equity/venture capital funds in Poland in 2007-2014 (in mln PLN)

Items	2007	2008	2009	2010	2011	2012	2013	2014
Value of domestic investments of private equity funds	2162	2549	2079	2015	2837	2262	1476	1410
– on domestic market	1742	1778	1154	1661	2584	1082	1276	955
– on foreign markets	420	771	925	354	253	460	200	455
Value of foreign investments of private equity funds in Poland	1082	448	1731	962	220	177	319	95
Value of financial resources obtained from domestic private equity funds	2158	2614	583	458	1823	2032	1097	45
Number of undertakings which obtained domestic private equity funds	50	67	29	52	63	72	94	76
Number of undertakings which obtained domestic venture capital funds	23	43	7	12	26	29	62	47

Source: own study based on: Rozwój systemu finansowania w Polsce w 2007 2011 i 2014 (The development of financing system in Poland in 2007, 2011 and 2014).

As it has been mentioned before, financing the investment at its early stages is characteristic for private equity/venture capital funds. Data in figure 2 confirm that in the period considered, over a half of enterprises which obtain venture capital support was at early stages of development and was financed by venture capital funds. In 2014, among 76 undertakings supported by private equity funds, 46 were financed by venture capital funds. Figure 2 depicts the structure of private equity/venture capital investments according to stages of an undertaking's development. In 2013, companies which received venture capital financing amounted to 66% of all companies financed with private equity. The situation was similar in 2014- enterprises using venture capital funds reached 62% of all enterprises supported by private equity resources. In both years analyzed, when one takes into consideration the stage of the undertaking's development, one has to notice that private equity/venture capital funds finance activities of enterprises being at the same stage of development.

As already mentioned, the market for private equity/venture capital investments in Poland is a small one and its changes within a year do not reflect on the tendencies in financing e.g. of its particular sectors. In years 2007-2014, analyzed in the article, one can observe some tendencies in 2013-2014, when there can be visible some minor similarities in the same sector. Investments in private equity/venture capital funds in Poland, according to sectors are presented in Figure 3.

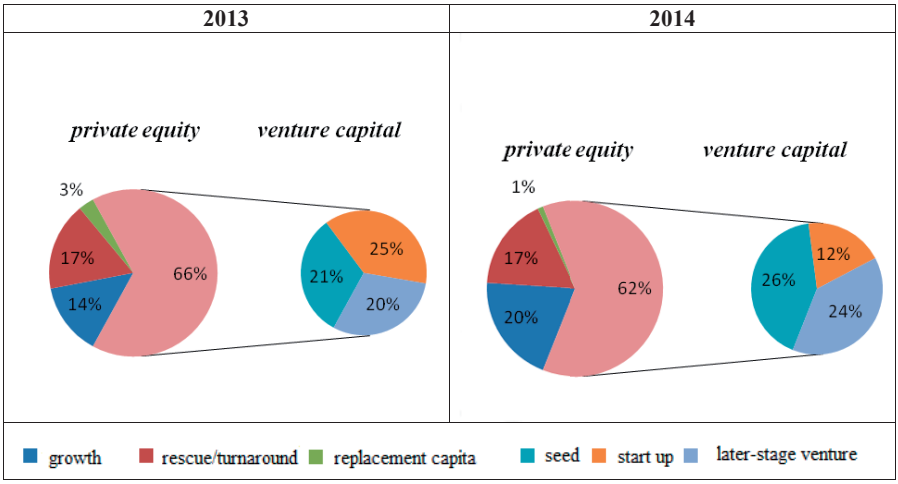

Figure 2. The structure of private equity investments specifying venture capital in Poland in 2014 according to the stage of company's development

Source: Own study based on Rynek private equity/venture capital w Polsce w 2014 roku.

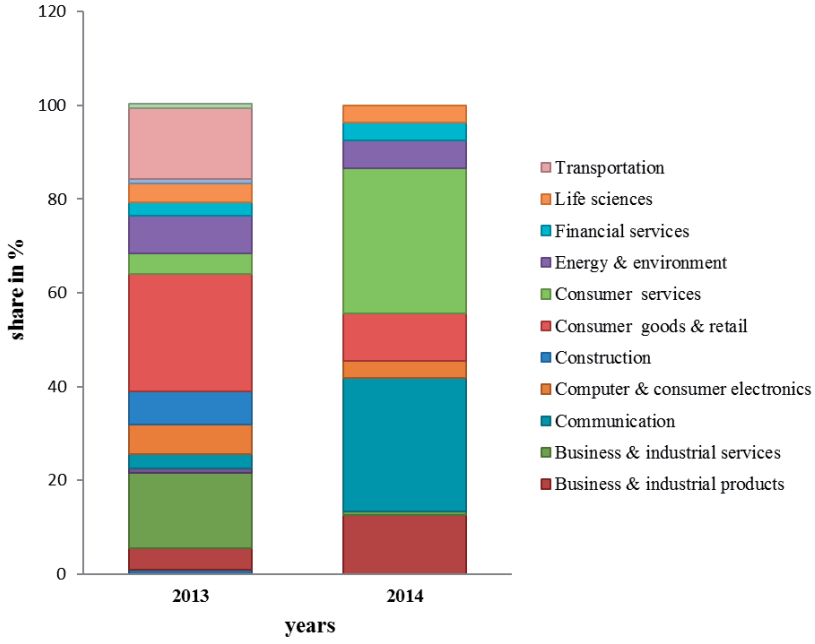

Figure 3. Investments in private equity/venture capital funds in Poland according to sectors in 2013 and 2014 (%)

Source: Own study based on: Rynek private equity/venture capital w Polsce w 2014 roku.

On the basis of existing data, no sound assessment of tendencies in financing enterprises from particular sectors is possible. In the following years, the discrepancy between them is even bigger, and it is mostly the result of single transactions.

5. Conclusions

A company which strives for development and strengthening its position on the market has to possess an adequate number of funds. When it does not, it can use debt financing. SME encounter a number of obstacles that prevent them from obtaining capital. As a consequence, it is a vital barrier for a company to develop and expand on the market. An effective, though still unpopular way of solving problems with capital is the use of private equity/venture capital funds. Funds of this kind are of a shareholding character, and the use of them does not cause the decrease in company's liquidity. It is worth noticing that companies which decide to use this kind of help do not only obtain capital, but also they get access to knowledge about new technologies, know-how, contacts databases, sales techniques, etc.

I have depicted in this paper private equity/venture capital market in Poland. Also, the value of domestic private equity/venture capital funds' investments has been analyzed in terms of their number and structure as well as sectors that received financing. The conclusion of this research is that private equity/venture capital market in Poland is relatively small, and the changes in this market do not represent the activity of these funds, especially in a long run. Private equity/venture capital funds constitute an alternative source of financing the company. Yet, they are classified as company's own, external sources of financing that are hard to access. The greatest obstacle to obtaining this kind of funding is its shareholding character, especially for sole traders. In 2014 only 76 enterprises received private equity funding which proves that this form of financing the company is still quite uncommon. However, it is worth pointing out that undertakings which use private equity/venture capital funds are less vulnerable to market turbulences, and the risk of their bankruptcy is very low. Further research of this subject will focus on financing the company's activities, especially at early stages of its development. Also, I will make an attempt to determine factors that help companies that use venture capital funds at early stages stay longer on the market.

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References

Bojańczyk, M. (2006). *Znaczenie funduszy venture capital dla rozwoju małych i średnich przedsiębiorstw*. In: P. Bożyk (Ed.), *Ekonomiczno-Informatyczny Kwartalnik Teoretyczny*. Warszawa: Wydawnictwo Wyższej Szkoły Ekonomiczno-Informatycznej.

Chojnacka, E. (2012). *Struktura kapitału spółek akcyjnych w Polsce w świetle teorii hierarchii źródeł finansowania*. Warszawa: Wydawnictwo CeDeWu.

Duliniec, A. (2011). *Finansowanie przedsiębiorstwa. Strategie i instrumenty,* Warszawa: Polskie Wydawnictwo Ekonomiczne.

Gabryelczyk, K. (2009). *Alternatywne fundusze inwestycyjne*. In: A. Szelągowska (Ed.), *Współczesna bankowość inwestycyjna* (pp. 18-29). Wydawnictwo CeDeWu.

Gompers, P., & Lerner, J. (1999). *The Venture Cpital Cycle*. Cambridge: MIT Press.

Górski, M. (2009). *Rynkowy system finansowy*. Warszawa: Polskie Wydawnictwo Ekonomiczne.

Johan, S., Schweizer, D., & Zhan, F. (Eds.). (2014). The Changing Latitude, Labor-Sponsored Venture capital Corporation in Canada. *Corporate Governance: An International Review*, *2*(22).

Kołosowska, B. (2013). *Finansowanie sektora małych i średnich przedsiębiorstw poprzez rynek kapitałowy w Polsce*. Warszawa: Wydawnictwo CeDeWu.

Kornasiewicz, A. (2004). *Venture capital w krajach rozwiniętych i w Polsce*. Warszawa: Wydawnictwo CeDeWu.

Krawczyk, M. (2012). *Finansowanie działalności innowacyjnej MŚP*. Łódź: Wydawnictwo Uniwersytetu Łódzkiego.

Lewicki, A. (2009). *Dostęp MŚP do oferty banków w okresie dekoniunktury oraz kryzysu*. II posiedzenie grupy roboczej ds. MŚP, KK, NSRO. Warszawa: Związek Banków Polskich,.

Mikołajczyk, O. (2014), *Private equity*, In: J. Szlęzak-Matusewicz & P. Felis (Eds.), *Finansowanie przedsiębiorstwa* (pp. 46-65). Warszawa: Wolters Kluwer.

Ministerstwo Gospodarki i Prac. (2005). *Venture Capital – szansą dla przedsiębiorczych,* Warszawa: Departament Przedsiębiorczości.

Misiołek, K. (2011). *Fundusze wysokiego ryzyka w finansowaniu rozwoju przedsiębiorstw sektora MSP*. In: M. Matejun (Ed.), *Wspomaganie i finansowanie rozwoju małych i średnich przedsiębiorstw* (pp. 360-372). Warszawa: Difin.

Ostaszewski, J. (2003). *Zarządzanie finansami w spółce akcyjnej*. Warszawa: Difin.

Rębilas, R. (2014). *Finansowanie inwestycji przedsiębiorstw*. Warszawa: Difin.

Skowronek-Mielczarek, A. (2005). *Małe iśrednie przedsiębiorstwa. Źródła finansowania*. Warszawa: Wydawnicowto C.H. Beck.
Skowronek-Mielczarek, A. (2002). *Źródła zewnętrznego finansowania małych i średnich przedsiębiorstw.* Warszawa: Oficyna Wydawnicza SGH.
Sobańska, K., & Sieradzan, P. (2004). *Inwestycje private equity/venture capital.* Warszawa: Wydawnictwo Key Text.
Sobańska, K., & Sieradzan, P. (2004). Inwestycje private equity/venture capital. Podstawowe warunki konstrukcji portfela funduszu private equity. *Studia i Prace Kolegium Zarządzania i Finansów, Zeszyt Naukowy* (52).
Sokół, H. (2015). *Możliwości finansowania rozwoju małych i średnich przedsiębiorstw.* In: J. Grzywacz, (Ed.), *Struktura kapitału w przedsiębiorstwie w warunkach ekspansji, kryzysu i zjawisk upadłościowych* (pp. 105-168). Warszawa: Oficyna Wydawnicza Szkoła Główna Handlowa w Warszawie.
Thomas, J. (2010). The Credit Oerformance of Private Equity-Backed Companies in the Great Recession of 2008-2009. *Social Science Research.*
Waniak-Michalak, H. (2015). *Wsparcie małych i średnich przedsiębiorstw przez organizacje niedziałające dla zysku.* Warszawa: Difin.
Wrzesiński, M. (2006). *Kapitał podwyższonego ryzyka. Proces inwestycyjny i efektywność*. Warszawa: Szkoła Główna-Handlowa w Warszawie – Oficyna Wydawnicza.

Others

Ustawa o rachunkowości z dnia 29 września 1994 r., t. jedn. Dz. U. 2013, poz. 330, z późn. zm.
www.psik.org.pl
Anual Survery of Pan-Europen Private Equity & Venture Cpital Activity. EVCA, 2005 Yearbook, European Private Equity and Venture Capital Association 2005.
Central and Eastern Europe Statistics 2014. EVCA. August 2015.
Rozwój systemu finansowania w Polsce w 2007 r. (2008). Warszawa: NBP.
Rozwój systemu finansowania w Polsce w 2011 r. (2012). Warszawa: NBP.
Rozwój systemu finansowania w Polsce w 2014r. (2015). Warszawa: NBP.
Rynek private equity/venture capital w Polsce w 2014 r.

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EXTERNAL COSTS OF CRUISING FOR UNOCCUPIED PARKING SPACE

Krzysztof Drabek[1]

Abstract
For several years, in connection with the development of city infrastructure, a gradual increase in the number of vehicles on the road is observed inPoland and the entire Europe. Governments need to solve the problems associated with the phenomenon of urban congestion and general overcrowding of city centers. Congestion can arise from many reasons. One of them is an irrelevant supply of parking space. The situation causes drivers to cruise for parking space, which generates a variety of costs. This article takes up the issue of identifying costs resulting from this phenomenon. The main aim of the article is to answer the question: what costs arise as a result of drivers cruising in search for parking space? The article attempts to develop a methodology for estimating these costs. Therefore, the results may be useful to local governments in making policy decisions concerning the public sector.
Keywords: *congestion, external costs, parking, cruising.*

1. Introduction

For several years, there has been a gradual increase in the number of vehicles on the road, both in Poland and throughout Europe. In 1970, the number of registered passenger cars in Poland was ca. 479,000. By 1992, their number increased to 2.5 million. Another twenty years brought another significant increase in the number of passenger cars to approx. 19 million in 2015 (PZPM, 2015). Poland reached the European average in 2012, where 1,000 population generated about 471 vehicles. The result equated the country with Great Britain, France, Belgium and Spain, outrunning Sweden, Holland, Denmark, Hungary and Czech Republic (Stańczyk & Pyrek, 2013). Such a large number of cars translates into an increase in the share of passenger vehicles in the movement of people; therefore, traffic conditions are worsening significantly, especially in urban areas. Szarata (2013, p. 107) cites the results of research conducted in 2013 in Krakow, which show that the share of travel by car amounted to 33.7% of all journeys. This share is often considered as the effect

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of the economic and social development of urban areas and the inherent cost of the growth of cities.

The choice of a car as a means of transport is dictated by, among others, by the fact that it is more competitive than public transport. In this situation, governments have to deal with the problems of ensuring parking spaces in cities. Despite the measures used by local governments, such as increasing the frequency of tram and bus transportation, fare integration, improvement of the quality of the rolling stock and increasing the availability of public transport, travelers are still more willing to choose the car. A study conducted in six major Polish cities shows that 70% of people who commute to the city center by car declared that they were able to reach their destination without transfers using public transport. The average time to reach the center took, on average, five minutes longer than by car. In the same study, 31% of people who preferred public transport indicated shorter travel time as the reason. However, 61% reported that their choice was dictated by the fact that they did not have to look for a place to park (Kostecka, 2015). As one can see, the problem of the deficit of parking spaces in urban centers influences decisions about the choice of means of transport. Due to the fact that the demand for parking space exceeds the supply, there is a phenomenon of cruising in drivers trying to find space to park. Cruising creates a queue of vehicles that look for parking space and waiting for it to appear. It is difficult to estimate how many drivers wish to park because they are mixed up with other drivers who want to go further. For this reason, the problem is not visible, and the phenomenon is not taken into account as a source of congestion and thus of related costs. Drivers looking for parking space tend to move at low speeds. As a result, congestion,[2] accidents and collisions, air pollution, noise and other costs associated with these effects arise. Another significant problem is that, so far, there have been no serious attempts to calculate these costs. These problems, the solution of which is usually expected from the public sector, are increasingly becoming the subject of research and analysis in the field of public economics. Especially much attention is paid to the issue of external costs arising from the increasingly expanding economic activity and its impact on the environment. As pointed out by Nobel laureate Stiglitz, issues, which economics of the public sector deals with, are among the most impressive in the whole economy (Stiglitz, 2013).

This article takes on the issue of cruising and the related phenomenon of external costs. Its purpose is to identify the external costs arising from cruising resulting from drivers searching for parking space and creating a model that would allow us to calculate these costs. The main objective is to say that it is possible to create a model that would allow the calculation of the external costs

2 Congestion is defined in detail further in the article.

arising from the phenomenon of cruising during the search for parking space. In the first place, to achieve this objective, the literature was reviewed and existing research on cruising analyzed. The rest of this article selects the most significant external costs associated with cruising and proposes a rough model which can be used for the calculation of the external costs of the examined phenomenon. It concludes with a summary, presentation of conclusions and an indication of further research.

2. External costs in economic theory

The concept of external costs is derived from the considerations by Marshall who, in his 1890 work "Principles of Economics", used the following terms: *"internal economies"* and *"external economies*". The first one concerns the issue of what is going on inside the enterprise, while the second is related to the benefits that result from the impact of the external environment (see e.g., Kachniewska, 2013; Łuczka & Przepióra, 2012). Marshall was referring his concepts to the notion of external benefits in relation to an enterprise and the internal benefits in relation to the sector in which it operates. He referred to the situation in which the presence of many companies with a similar profile in a region generates benefits for the individual companies in the form of economies of scale effect resulting, e.g., from specialization, a transportation network or the availability of skilled workforce in the area. The concept of externalities in the proper understanding of modern neoclassical economics was introduced only later by Pigou in his welfare economics. Pigou, in his work *The Economies of Welfare* (Pigou, 1932) distinguished the concept of private and social benefits and the cost of personal and social development, on top of recognizing the discrepancy between the social marginal product and marginal social product. These disparities appear when all costs and benefits of a market entity's activities are not borne by it and not taken into account in the decision-making processes (Huderek-Głapska, 2014). Table 1 shows the popular definitions of externalities.

Given the above definitions, it can be stated that the negative external effect is the same as an external cost. This reasoning is also adopted by Famielec (1999, p. 33) who wrote that "*external costs are harmful external effects, implying production costs and consumption incurred by people not participating directly in the production, consumption or replacement of the goods"*. Further in the article, externality will be understood as a component of external costs and benefits.

Table 1. Selected definitions of "*externalities*"

Author/source and date of publication	Definition
Black, Hashmizade & Myles (2009)	Externalities – cost or benefit arising from activities that do not directly affect the person or organization engaged in this activity.
Blaug (1996)	The benefits, i.e., positive externalities (external economies), or losses, i.e., negative externalities (external diseconomies) always occur when the production function of an enterprise includes variables that are not expenditures in the physical sense, but rather result from activities of other enterprises.
Baumol & Oate (1997)	External effect is present if the utility or production dependencies of a certain entity, such as A, are a function of real (non-cash) variables whose values are determined by other entities (individuals, businesses, governments) without particular regard for the welfare of the entity A.
Kamerschen, McKenzie & Nardinelli (1991)	Externalities are positive or negative effects which may be caused by an exchange/transaction with people who are not directly involved in the production, consumption or exchange of goods. They are, therefore, impacts on third parties arising from the scarcity of the market.
Samuelson & Nordhaus (1995)	Externalities (or leakage effects) occur when businesses or individuals impose some other expenses or certain benefits on others, while the "others" do not receive proper payment, or incur the respective costs.
Samuelson & Nordhaus (1996)	An externality occurs when the conduct of one unit affects the welfare of others, and this is not reflected in monetary transactions on the market.
Stiglitz (2013)	Externalities are divided into positive and negative externalities. Negative externalities arise when the actions of one person give rise to costs the incurred by others. In contrast, positive externalities occur when the actions of one person confer benefits to others.
Begg, Fischer & Dornbusch (2000).	Externalities arise when the decision a unit of production or consumption has a direct impact on the production or consumption of others in another way than through market prices
Famielec (1999)	An externality occurs when a manufacturer or a consumer directly experiences the effects of production or consumption carried out by another entity.

Sources: Based on Stiglitz (2013, p. 9), Trela (2012) and Famielec (1999, p. 23).

This article raises the problem of cruising for parking space for vehicles and thus is closely related to the transportation sector. Huderek-Głapska (2014), however, draws our attention to the difficulty in defining and classifying externalities in this sector. The literature lacks consistency and a clear approach to the characteristics of externalities generated by the transport sector. These approaches depend on a variety of criteria that guide the authors, among other things: the subject of research, time range and level of spatial analysis, as well as the type of impact. Simply put, external effects of transportation can be divided into those associated with the provision (construction and maintenance) of infrastructure and those associated with the use of this infrastructure. The division of the effects of transportation infrastructure for the consequences arising from its supply and those resulting from the use of infrastructure facilities is a basic classification. At the same time, these effects are interrelated and in practice, it is difficult to distinguish which changes in the economy are the result of supply and which are the result of the use of infrastructure (Huderek-Głapska, 2014, p. 91). For the point of view of the above distinction, this article deals with the distribution of costs arising from the use of infrastructure.

In the literature, you can meet with a number of classifications of externalities in transportation (Table 2).

Table 2. Classification of the effects of transport

Author	Classification of the effects of transport
Heggie (1978)	Direct impact: – shortened time of transport – reduced cost of vehicle use – improved safety of transport – fewer accidents – savings resulting from lower cost of transportation Indirect impact: – effects on the operation of other sectors of the economy – effect on the land use
Rietvield & Bruisma (1998)	Short-term demand effects: – the effect of the investment – the effect of pushing out Long-term demand effects: – the effect of the operation and maintenance of infrastructure Long-term supply effects: – effect on productivity (including the process of production, trade, labor market, monopoly prices) – impact on the location of activity and the distribution of production factors – impact on property prices
Kamińska (1998)	Social benefits of transportation: – private benefits of direct and indirect users – external benefits beyond transportation – external benefits generated by the infrastructure Social costs of transport – private costs of movement of persons and goods – infrastructure costs – costs related to the creation and maintenance of infrastructure and operation of the means of transport
Banister & Berechman (2000)	– externalities in cash – allocative externalities – environmental effects —network effects – impact on the labor market – agglomeration effect – reduced production costs – spatial and organizational changes

Author	Classification of the effects of transport
Rothengatter (2000)	Effects associated with the provision of transport infrastructure: – external benefits in the form of encouraging regional development Effects related to the use of transport infrastructure: – external costs including congestion, cost of providing infrastructure, environmental costs, accident costs
OECD (2002)	User advantages: – change of travel time – change the operating costs of vehicles – impact on traffic safety Effects of transport networks: – creating new services – intermodal shift in demand – improvement of the reliability of transport – better quality of the transportation services Socio-economic effects: – changes in the availability – changes in employment in the region – changes in the efficiency of production – changes in social integration – changes in the value of real estate – environmental effects
Rosik & Szuster (2008)	Economic and security effects: – financial flows (costs of construction, maintenance, and repair of infrastructure, income from fees for the use of infrastructure) – direct benefits for users (shorter travel time, reduced operating costs of the means of transport, improving traffic safety) – direct network effects (induced mobility, intermodal shifts, changes in the quality of transport services); Socio-economic effects: – changes in the region's availability of transportation – changes in the productivity of the means of production – short-and long-term changes in the size of income and employment – redistribution of employment and income between regions – intra- and inter-regional migrations of the means of production – changes in the value of real estate Environmental effects: – climate change – air, soil, surface water and groundwater pollution – noise and vibrations – consumption of natural resources – reduced biodiversity of natural species – impact on national heritage
Grzelakowski (2005)	– spatial, shaping the system infrastructure vs. the city and the closest region – social, determined by the mechanism of functioning of the labor market – environmental, as the impact of infrastructure on the environment

Sources: Based on Huderek-Głapska (2014).

Given the above classification (Table 2) and the scope of this article, it is assumed that the external costs of transport can be divided into:

- the cost of congestion,
- the costs of environmental pollution,
- costs of accidents and collisions,
- costs of noise.

This division is appropriate for further considerations presented in this article.

3. Problems arising from cruising for parking space

Cruising for parking is characterized by the fact that the drivers move at low speeds to approx. 15km/h (Shoup, 2007), or stop in the street to wait for the release of parking space. Cruising for parking causes a kind of a moving queue of drivers who are waiting. Cruising causes the formation of blockages and raises many negative effects. In slow traffic or traffic jams resulting from cruising for parking, people who do not want to park, just cross through the area are also involuntarily involved. Some studies might have both a theoretical and empirical character that discuss the issue of cruising for parking. One can include study such authors as Shoup (2006, 2007), Commenter, Wentink and Rietveld (2012), Arnott, Inci and Rowse (2015) or Geroliminis (2015). More detailed studies on solutions to help prevent cruising for parking are presented, among others, by Gallo D'Acierno and Montella (2011) and Arnott (2014). However, it is difficult to find studies showing how high the costs of generating the phenomenon of cruising for parking are. In previous studies, the problem of external costs generated by cruising for parking is merely identified and reported. However, no studies examining the external costs of this phenomenon have been published. Most public studies on cruising for parking come from the United States. For example, Shoup (2007) writes that in a study conducted in 2006, interviews with drivers standing at the traffic lights in a Manhattan neighborhood, 28% of them cruised in the search for parking space. Similar studies carried out in Brooklyn showed that 45% of drivers cruised in search of a place to park. The situation was similar in many other streets of New York. Shoup (2004) indicates that cruising for parking is due to the inadequate parking policy of cities. When the city has very low parking fees, or sometimes even parking in the street is free, cruising, from an individual point of view of the driver, is rational. As a result, however, the effects of individual rational decisions cause externalities such as congestion, traffic jams, fuel consumption, accidents and air pollution. This study indicates that drivers do not necessarily insist on free parking spaces. They are willing to pay for a convenient place to park, and the most important role here is played by the price and availability and location of parking space – near to their destination (Stienstra, 2007). On the other hand, Geroliminis (2015) believes that existing research shows that cruising for parking is the source of congestion. According to studies, during peak hours around Harvard Square in Massachusetts, 30% of vehicles were searching for a parking space, and the average time to find a spot was 12 minutes. Research carried out in Germany, and the UK showed that the average ratio of time getting to the destination to the time spent on searching for parking space was 2 to 1.

As indicated by Shoup (2006) in the period from 1927 to 2001, studies on cruising for parking in crowded cities have shown that cruising in order to find free space on the curb is from 3.5 to 14 minutes and that from 8% to 74% traffic jams are caused by cruising for parking. The parking maneuver is often difficult to do and takes a relatively long time, so not only cruising for parking creates congestion, but also the very function of parking, too. In France, the time needed to find a place to park, especially in the afternoon and evening, was up to 10% of the total driving time. Studies in Copenhagen show that in the evening (20:00 to 24:00) approx. 15% of the local drivers lost more than 15 minutes to find a spot to park their vehicle (Igliński, 2009, p. 115). Research as mentioned above shows that cruising for parking is a phenomenon that causes external costs. Publications are exploring the general issue of congestion, which describe external costs of its occurrence, they refer to the entire transportation sector. There is a lack of studies investigating the external costs of the particular phenomenon of cruising for parking.

4. External costs generated by cruising for parking in the search for parking spaces

Cruising usually happens in the intensively used areas such as city centers and around tourist attractions. The costs generated by cruising for parking thus relate to places where there are large concentrations of people, therefore, they are particularly harmful. Cruising for parking has a negative impact on other road users and residents of the area, generating costs comparable to the costs of congestion (Ommerman, Wentink & Rietveld, 2012). The authors Shoup (2006) and Pierce and Shoup (2013a; 2013b) in their publications indicate that while curb parking is cheaper than in parking lots, there are problems such as congestion, collisions, wasting fuel, air pollution and negative impact on the infrastructure of pedestrian paths. In his other publication, Shoup (2007) also indicates that the search for parking spaces on the curb also generates time costs. Given the division quoted by Huderek-Glapską (2014) of the external costs of transport, it can be stated that the cost of cruising also fits in this division. Therefore, external costs arising from the cruising for parking can include congestion costs, costs of accidents and collisions, the cost of air pollution, and noise costs.

4.1. The cost of congestion

In the literature, one can find publications about congestion in cities and their external costs. These studies generally relate to congestion regardless of the reasons that caused it. Congestion can be caused both by cruising for parking

by vehicles as well as by bottlenecks (OECD, 1999), due to insufficient capacity of the individual sections of roads, road works, incidents, accidents and collisions, events, weather conditions, social actions or demonstrations. A popular definition of congestion, quoted in the literature, is suggested by Goodwin and Dargay (1999): *"Congestion is mutual blocking of the movement of vehicles, due to the existing relationship between the objective speed of a moving vehicles and the volume of flow under conditions in which the capacity of the transport system is approaching exhaustion."* The effects of congestion include lower speed and longer travel time.

The most significant expenses resulting from congestion include the loss of time by road users who participate in the congestion (Gołębiowski, Jacyna-Gołda, Kłodawski, Lewczuk & Żak, 2014; European Commission (EC), 2007; Maibach et al., 2008). Further in this article, the cost of congestion is understood as the cost of time lost as a result of participation in congestion.

4.2. The costs of air pollution

As a result of fuel combustion in engines of various means of transport, a number of harmful compounds it produced that enter first into the atmosphere causing its pollution and also affect the hydrosphere and lithosphere. These compounds include sulfur dioxide, nitrogen oxides, methane and other non-methane volatile organic compounds, carbon monoxide and carbon dioxide, nitrous oxide and heavy metals, particularly lead and aluminum as well as carbon black (Igliński, 2009).

4.3. The costs of accidents and collisions

Everywhere where there is traffic, we have to deal also with traffic accidents and collisions. An accident is an event where people are wounded (more than 7 days in hospital), or killed. A collision is a traffic incident, which involves only material damage or where an injured person or persons are hospitalized less than seven days. The occurrence of road accidents and collisions causes significant social costs. As a result of accidents, following cost groups occur (in order of their creation) (Igliński, 2009, p. 94): material losses resulting from damage to the vehicle and the immediate surroundings of the accident site; costs associated with calling the police, ambulance, fire brigade or roadside assistance; medical care or burial costs, and insurance costs. This can follow up with legal services; compensation for pain and suffering and moral prejudice of people involved in the accident and their loved ones. Also, a loss in the production of goods and services resulting from injuries or death of persons involved in an accident. Finally, lowering the "social values" resulting

from death; the related potential contribution of individuals to the general welfare.

The effects of road traffic collisions are not as serious as accidents, but their occurrence is much more frequent. Accidents and collisions take place also during the parking attempts and cruising for parking. Although collisions during parking are typical, accidents occur much less frequently (Iron, 2007). It is worth noting that the risk that the driver, who is cruising for parking will result in an accident is low. The chance of an accident is much greater when irritated or hurrying drivers who are following the cruiser try to rapidly overtake their vehicle or do other dangerous maneuvers, thereby exposing other road users (particularly pedestrians).

4.4. Costs of noise

Noise in transportation causes a number of diseases which can result in the loss of health or even life. Noise can cause, among others, trouble sleeping, headaches, fatigue caused by limited possibilities of recreation in one's free time (Igliński, 2009, p. 90). In addition, noise causes annoyance, disturbance of cognitive function (learning and understanding), cardiovascular disease as well as adverse effects associated with mental health (Trela, 2012).

Methods for calculating the costs incurred as a result of the above phenomena are described in detail, among others, in reports prepared for the European Commission (Maibach et al., 2008; Korzhenevych et al., 2014).

5. Methodology of studying cruising for parking externalities

In response to the problem of the lack of research on external costs generated by cruising for parking, it was decided to build a model that would allow the estimation of such costs. To build the model, one needs to make several assumptions:

1) External costs arise from cruising for parking from the moment when the first vehicle begins to look for parking space and decelerates to this end. At this point begins the time in which they begin to form external costs. The longer the time, the higher the level of costs we face.
2) When the first vehicle starts cruising and does not interfere with other vehicles in traffic, as no one is behind it, it still entails the costs of incidents and accidents, air pollution and noise.
3) Congestion and the costs associated with it start to emerge when the vehicle that is cruising makes it difficult to move for at least one other vehicle, which is not necessarily looking for a parking space.

4) In a situation when one or more cars are moving behind the vehicle which is cruising are treated in the same as the users who are driving in order to reach a different destination than the vehicle doing the rounds to find a spot to park.
5) Where the phenomenon of cruising for parking involves two vehicles (e.g., one vehicle cruising and another participant who is not searching for parking space), you can already use the proposed model.
6) It is assumed that the known individual unit costs of all types of costs in the model vehicle, which ultimately participates in the cruising for parking congestion.

This methodology is the simplest form of the model treating each vehicle in the same way (fuel consumption, pollution, the number of passengers). The model assumes that the external costs of circulation depend primarily on the amount of vehicles that are involved in congestion. This model can be refined at the research stage. With the appropriate tools and methods of measurement one can, for example, include categorization of cars, which affect, in different ways, the environment and fuel consumption (motorcycles, cars, trucks, buses, etc.) In the constructed model, the external costs of cruising for parking are treated as an indicator showing that the cost in monetary terms was generated in a given unit of time. In the proposed model, the external cost of cruising is expressed in zl/h. Thus, the individual costs in the model must also be expressed in the same units of measurement. The general form of the model shown in the following Formula 1.

$$ECOC(zł/h) = \sum_{i=1}^{n+1} P_i + \sum_{i=1}^{n+1} A_i + \sum_{i=1}^{n+1} N_i + \sum_{i=1}^{n} C_i \qquad (1)$$

Where:

ECOC – External cost of cruising (zl/h)

n – the number of cars participating in the congestion (followers of the cruising vehicle)

P – cost of air pollution produced by the vehicle

A – average cost of accidents and collisions caused by the vehicle

N – cost of noise generated by the vehicle

C – cost of congestion caused by the vehicle

In order to use the model to calculate the external cost of cruising for parking, it is proposed that in the chosen areas (e.g., a city section) and period (e.g., a week) one should investigate how many cars cruised for parking, how much time it took and how many cars were involved in congestion caused

by cruising. After collecting the above data, the model will calculate what externalities in the selected area were generated by the phenomenon of cruising for parking. As a result, local governments will have a picture of the costs arising from the phenomenon and will be able to apply a specific policy to limit it. It follows that the applied model can be used for the calculation of externalities of cruising by cars in search of parking space, which confirms the hypothesis presented in this article. The biggest hurdle in the application of this model is the problem of quantitative measurement of cruising drivers and other participants of congestion. Only a method of empirical examination of the actual number of the drivers involved in the phenomenon will allow the use of the model and thus enable us to calculate the external costs.

6. Conclusions

The phenomenon of cruising is known to every driver. Few, however, realize that what external costs it generates. So far, no serious studies of the external costs generated by cruising for parking have been conducted, despite the fact that this phenomenon has been described by many authors. The basis for the calculation of the external costs of cruising for parking is to build a suitable model that would serve as a base for research. The answer to the problem of the lack of serious studies in the calculation of the external costs of cruising for parking is the model proposal presented in this article. The model is shown in its simplest form and can be adapted to specific research based on the studied area and the specificity of vehicles or infrastructure. In order for the model to be applied in practice, one should first estimate the single costs (generated by one vehicle) for the different types of costs in the model. This issue, however, is wide enough to make a topic for a separate article. The phenomenon of the cruising for parking in Poland is a subject that is described sporadically, and there are no studies in the literature in this field. The few studies have been published abroad, in particular in the United States. They examine the problem of cruising for parking space in cities with different characteristics than the Polish cities. Therefore, there is a need for a broad study of the phenomenon as manifested in Polish cities and the of the costs associated with its occurrence. There is also no methodology for measuring the numbers of drivers who cruise in search of parking space and the participants of congestion caused by cruising. Only after the development of such methodology will we be able to calculate the exact scale of the phenomenon and apply the presented model in order to calculate the external costs cruising for parking causes. The results of such studies may become rather valuable for local authorities in making decisions in the area of the public sector policy and particularly – transport policy.

References

Arnott, R., Inci, & E. Rowse, J. (2015). Downtown curbside parking capacity. *Journal of Urban Economics, 86*, 83-97

Arnott, R. (2014). On the optimal target curbside parking occupancy rate. *Economics of Transportation*, *3*, 133-144

Begg, D., Fischer, S., & Dornbusch, R. (2000). *Ekonomia – mikroekonomia*. Warszawa: Polskie Wydawnictwo Ekonomiczne

Begg, D., Fischer, S., & Dornbusch, R. (1998). *Ekonomia – makroekonomia*. Warszawa: Polskie Wydawnictwo Ekonomiczne

Korzhenevych A., Dehnen N., BröckerJ., Holtkamp M., Meier H., Gibson G., ... Cox V. (2014, January). *Update of the Handbook on External Costs of Transport*. Retrieved from http://ec.europa.eu/transport/themes/sustainable/studies/doc/2014-handbook-external-costs-transport.pdf.

Commission Of The European Communities. (20.12.1995). Towards Fair And Efficient Pricing In Transport Policy Options For Internalising The External Costs Of Transport In The European Union, Green Paper.

Famielec, J. (1999). *Straty i korzyści ekologiczne w gospodarce narodowe*j. Warszawa: Wydawnictwo Naukowe PWN

Gallo, M., D'Acierno, L., & Montella, B. (2011). A multilayer model to simulate cruising for parking in urban areas. *Transport Policy*, *18*(5), 735-744.

Geroliminis, N. (2015). Cruising-for-parking in congested cities with an MFD representation. *Economics of Transportation*, 4(3), 156–165

Gołębiowski, P., Jacyna-Gołda I., Kłodawski, M., Lewczuk, K., & Żak, J. (2014). Wybrane aspekty szacowania kosztów zewnętrznych w transporcie, *Logistyka,* 4 (Cd 2), 2609-2618.

Huderek-Głapska, S. (2014). Efekty zewnętrzne transportu: aspekty teoretyczne. *Zeszyty Naukowe Uniwersytetu Szczecińskiego – Problemy Transportu i Logistyki*, *25*(813), 83-97.

Igliński, J. (2009). *Ograniczanie poziomu kongestii transportowej a zrównoważony rozwój miast* (Doctoral dissertation, Uniwersytet Ekonomiczny w Poznaniu, Poznań). Retrieved from http://www.wbc.poznan.pl/Content/122963/Iglinski_Hubert-rozprawa_doktorska.pdf.

Jos van Ommeren, N., Wentink, D., & Rietveld, P. (2012). Empirical evidence on cruising for parking. *Transportation Research Part A: Policy and Practice*, *46*(1), 123-130.

Kostelecka, A. (2015). Badanie wybranych cech parkowania w polskich miastach. *Zeszyty Naukowo-Techniczne SITK RP Oddział w Krakowie – Polityka Parkingowa w Miatach*, *1*(105).

Kachniewska, M. (2013). Towards the definition of a tourism cluster. *Journal of Entrepreneurship, Management and Innovation, 9*(1), 33-56.

Kotowska, I. (2014). Problem Internalizacji Kosztów Zewnętrznych Transportu Drogowego. *Zeszyty Naukowe Uniwersytetu Szczecińskiego – Problemy transportu i logistyki*, *25*(813), 99-113.

Koźlak, A. (2015). Gospodarcze, społeczne i ekologiczne skutki kongestii transportowej. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, *402*, 153-164

Maibach M., Schreyer C., Sutter D., van Essen H.P., Boon B.H., Smokers R., … Bąk M. (2008, February). *Handbook on estimation of external costs in the transport sector Produced within the study Internalisation Measures and Policies for All external Cost of Transport (IMPACT)*. Retrieved from http://ec.europa.eu/transport/themes/sustainable/doc/2008_costs_handbook.pdf

Łuczka, T. & Przepióra, P. (2012). Regional determinants of efficiency growth of small and medium-sized enterprises. Evidence from Poland. *Journal of Entrepreneurship, Management and Innovating*, *8*(1), 138-154.

Marshall, A. (1890). *Principles of Economics*. London: Macmillan.

OECD. (07.12.1999). *ECMT Round Tables Traffic Congestion in Europe: European Conference of Ministers of Transport.*

Pierce, G., & Shoup, D. (2013a). Getting the Prices Right: An Evaluation of Pricing Parking by Demand in San Francisco. *Journal of the American Planning Association*, *79*(1), 67-81.

Pierce, G. & Shoup, D. (2013b). SFpark: Pricing Parking by Demand. *Access*, *43*, 20-28.

Pigou, A. (1932). *The Economics of Welfare*. London: Macmillan.

Preparation of an Impact Assessment on the Internalisation of External Costs Consultation Document (2007). Brussels, European Commission. Retrieved from http://ec.europa.eu/transport/themes/sustainable/consultations/doc/2007_12_31_cost_consultation_paper.pdf

PZPM. (2015). Raport 2015, Retrieved from http://www.pzpm.org.pl/Publikacje/Raporty/Raport-branzy-motoryzacyjnej-2015.

Shoup, D. (2004). The ideal source of local public revenue. *Regional Science and Urban Economics*, *34*, 753–784.

Shoup D. (2006). Cruising for Parking. *Transport Policy*, *13*(6), 479-486.

Shoup D. (2007). Cruising for Parking. *Access, 3*0, 16-22.

Szarata, A. (2015). Rola pozyskiwania danych w kontekście funkcjonowania stref płatnego parkowania. *Zeszyty Naukowo-Techniczne SITK RP Oddział w Krakowie – Polityka Parkingowa w Miatach*, *1*(105), 107-117.

Szymalski, W. (2006). Internalizacja kosztów zewnętrznych transportu w Polsce. Retrieved from http://www.zm.org.pl/?a=koszty_zewnetrzne-06c

Trela, M. (2012). *Ekonomiczne instrumenty systemu internalizacji kosztów zewnętrznych wynikających z eksploatacji środków transportu drogowego w Polsce* (Doctoral dissertation, Akademia Górniczo Hutnicza w Krakowie, Kraków). Retrieved from http://winntbg.bg.agh.edu.pl/rozprawy2/10545/full10545.pdf

Żelzny, T. (2007). Zagrożenia bezpieczeństwa ruchu drogowego związane z parkowaniem na przykładzie Krakowa. *Zeszyty Naukowo-Techniczne*

SITK RP Oddział w Krakowie – Polityka Parkingowa w Miatach, *80*(134), 237-244.
Stiglitz, J. E. (2013). *Ekonomia sektora publicznego*. Warszawa: Wydawnictwo Naukowe PWN.

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IV.
BUSINESS AND NON-PROFIT ORGANIZATIONS – GLOBAL AND REGIONAL ASPECTS

THE COMPARISON OF FUNDS ALLOCATION UNDER THE REGIONAL OPERATIONAL PROGRAMMES IN 2007–2013 AND 2014–2020 PROGRAMMING PERIODS

Justyna Sokołowska-Woźniak[1] and Dariusz Woźniak[2]

Abstract

The Intraregional policy comprises actions taken by the regional self-government authorities and their agencies which influence the processes of socio-economic development taking place in the region. Due to the volume of funds involved, the Regional Operational Programmes (ROPs) can be regarded as the most important instrument of intraregional policy in Poland (in the programming period 2007-2013 voivodeships received 16,6 billion of Euro and in the current programming period 2014-2020 the planned allocation amounts to 31 billion Euro). The primary objective of this study is to characterize and compare the distribution of Polish voivodeships' operational programmess funds in 2007-2013 and 2014-2020 programming periods for different categories of intervention to find out if any patterns of allocation exist. The results of this study will be used in further authors' investigations concerning the degree of adequacy of voivodeships' funds allocation to the needs and potentials of the region (smart specialization policy approach).

Keywords: *intraregional policy, allocation, EU funds, regional operational programmes, cohesion policy.*

1. Introduction

In 2007–2013 and 2014–2020 European Union (EU) programming periods, Poland received the biggest allocation of the EU structural funds among the 28 Member States. In the 2007–2013 EU framework of regional policy (structural, cohesion) alone, 67 billion Euros of support for the Polish economy was granted and in 2014–2020 the allocation for Poland amounts to 82.5 billion Euros. EU funds can be then perceived as one of the main tools of economic policy implementation in Poland. A significant part of this support is allocated

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under regional operational programs which are designed and managed by the local authorities. In the programming period, 2007-2013 Polish voivodeships allocated 16,6 billion of Euro under ROPs. In addition, local authorities had also impact on the allocation of the regional component of the operational program Human Capital (about 7 billion Euro). In the current programming period, the sum of funds is even larger in nominal and relative terms, respectively: 31 billion of Euro and 41% of EU cohesion funds in Poland. This significant amount of allocation seems to be the most important instrument of intraregional policy implementation, where intraregional policy is understood as the policy conducted by the regional self-government authorities which influence the processes of socio-economic development in the region[3].

The main objective of this study is to characterize and compare the allocation of Polish voivodeships' operational programs funds in 2007-2013 and 2014-2020 programming periods for different categories of intervention to find out if any patterns of allocation exist. To achieve such an objective the following methods will be used:

- review of official documents related to EU and Polish policy to recognize their influence on the planning of funds allocation,
- analysis of planned funds allocation under 16 Regional Operational Programmes by categories of intervention in 2007-2013 and 2014-2020 EU programming periods,
- the statistical method of computing relative variability, precisely the coefficient of variation ratio (CV) to compare the degree of variation of the voivodeships' planned allocation of funds for specific intervention fields,
- the hierarchical cluster analysis using Euclidean distance and Ward technic of agglomeration to find the groups of similar voivodeships in terms of funds allocation.

2. The framework of Regional Operational Programmes

In 2007-2013 programming period National Strategic Reference Framework (NSRF) was one of the most important documents in which the strategic priorities of the country and the implementation of cohesion policy was identified (Ministry of Regional Development, 2006). The basis for the preparation of this document were set up in Community Strategic Guidelines (CEC, 2005), which was followed by the Council Regulation No. 1083/2006 of 11 July 2006. The sum of EUR 67 billion was envisaged in the NSRF from the European Regional Development Fund (ERDF) (52%), European Social Fund (ESF) (15%) and the Cohesion Fund (CF) (33%) to support the

3 The division into interregional and intraregional policy is widely used in the literature, see e.g.: Gilowska et al. (1998), Gorzelak (2007) and Churski (2008).

realisation of the objectives of cohesion policy (Convergence and European Territorial Cooperation) in Poland. Figure 1 demonstrates the breakdown of the NSRF into specific operational programs (OP). The biggest portion of funds was planned to be allocated to the Infrastructure and Environment OP (42%). 25% of funds was dedicated to support the realization of 16 regional operational programs. The support provided for the human capital investments accounted for 15% of funds (regional component constitutes 60% of that sum) and for innovation – 13%. As in the case of all countries, a significant portion of NSRF funds (64%) were concentrated on the realization of the Lisbon Strategy for jobs and growth's goals[4].

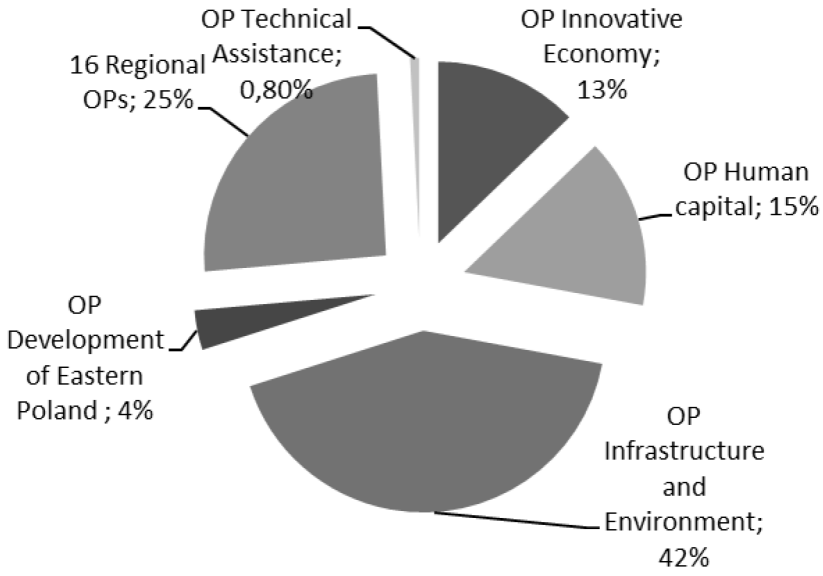

Figure 1. The breakdown of cohesion policy funds 2007-2013 (National Strategic Reference Framework)

Partnership Agreement (PA) is the most important document, prepared by the Polish government, which in the current programming period defines the strategy of European funds interventions in Poland, within the framework of three EU policies and 5 structural and investment funds (ESIF): the Cohesion Policy [the European Regional Development Fund (ERDF), the Cohesion Fund (CF), the European Social Fund (ESF)], the Common Agricultural

4 It was a consequence of the EU Council decision taken in December 2005 that part of the cohesion policy funds should be allocated for investments related to the objectives of the renewed Lisbon Strategy (specifically: 60% for less-developed regions and 75% for the other regions) (1083/2006, p. 25). More on this issue in: Sokołowska-Woźniak and Woźniak (2008) and Sokołowska-Woźniak (2013).

Policy (CAP) [the European Agricultural Fund for Rural Development (EAFRD)] and Common Fisheries Policy (CFP) [the European Maritime and Fisheries Fund (EMFF)] (The Ministry of Infrastructure and Development, 2014). Polish's Partnership Agreement is influenced by a number of policy documents at European and National level. At European level, the main strategic document is the EU's 10 year growth strategy "Europe 2020 strategy for smart, sustainable and inclusive growth" (CEC, 2010), together with the Cohesion Policy Legislative Package[5], the Common Strategic Framework (CSF) and Country Specific Recommendations (CSR), Position Paper for Poland (European Commission, 2012). At National level, the most important document is National Development Strategy 2020 – Active Society, Competitive Economy, Efficient State (NDS 2020) adopted by the Council of Ministers on 25 September 2012, and operationalized in the integrated strategies. The aims set up in PA are identical with the aims of NDS 2020, which on the other hand remain synergic with the Europe 2020 strategy. To conclude, the expenditure in the new programming period should be directed to the achievement of Europe 2020 Strategy objectives, so they should be focused on stimulating smart sustainable and inclusive growth. To improve coordination and efficiency of the allocation of EU's five structural and investment funds, Regulation of the European Parliament and the Council (EU) No. 1303/2013 of 17 December 2013 was prepared. Article 9 of this document includes 11 thematic objectives (TO) around which the intervention should be focused.[6] In five regulations which lay on the common provision on each ESIF fund, the investment priorities (ERDF, ESF, CF) and Union priorities (EAFRD and EMFF) specific to each fund are identified.

In accordance with Council Regulations No. 1311/2013 of 2 December 2013 laying down the multiannual financial framework for the years 2014-2020 (Council Regulations, 2013), the total allocation for Poland amounts to approx. 82.5 billion (before transfers and with the estimated costs of transfers of technical assistance and the innovative urban actions). After subtracting compulsory transfers to instruments and programs managed directly by the European Commission (about 5 billion EUR) the total sum of Cohesion Policy funds (ERDF, ESF, Cohesion Fund) which is allocated within Partnership

5 The most important are Common Provisions Regulation (CPR) No. 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No. 1083/2006., followed by three specific regulations for the ERDF, ESF and Cohesion Fund.

6 In turn, the Annex 1 of the Common Strategic Framework "sets out in an integrated manner for each of the thematic objectives the main goals to be addressed, the key actions for each CSF Fund and corresponding general implementation principles to ensure effective and efficient use of the funds".

Agreement equals to 77.6 bln EUR, including 252 million EUR for youth initiative and 700.7 million EUR for territorial cooperation.

Figure 2 enables to analyze the breakdown of cohesion policy funds in Poland into national operational programs (NOP) and regional operational programs (ROP), which are the main instruments of the Partnership Agreement implementation.

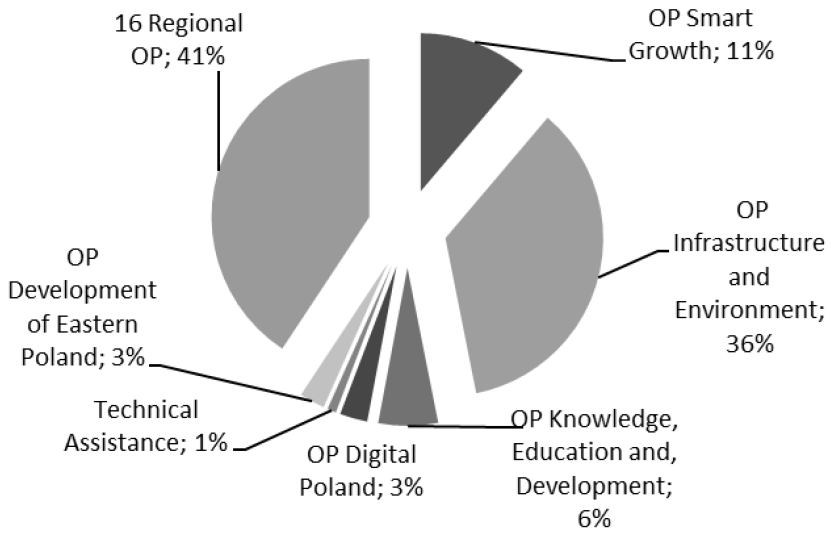

Figure 2. The breakdown of cohesion policy funds 2014-2020 (Partnership Agreement)

When the two programming periods' breakdown is compared, the visible increase of funds allocated for regional operational programs can be noticed (25% in the prior period and 41% in the current period). The amount of funds dedicated for Infrastructure decreased from 42% to 36% in the current programming period but still constitutes a large share. The share of funds dedicated to human capital investments under OP Knowledge, Education and Development will be lower than in last programming period under Human Capital OP (decrease from 15% to 6%). However, part of the priorities which were financed under Human Capital OP will be financed in this period under Regional Operational Programmes. ROPs in 2014-2020 programming period are dual-fund programs, financed both from ERDF and ESF, which is the novelty. In the new programming period, there is a special operational program designed to strengthen digital foundations for the national development: OP Digital Poland with 3% share of the cohesion funds in Poland.

Table 1. Comparison of EU funds allocation structure in the framework of Partnership Agreement and regional operational programs (broken down by CSF thematic objectives and in the context of the Europe 2020 Strategy)

Thematic Objectives	% allocation of EU funds by CSF thematic objectives in the framework of Partnership Agreement	% allocation of EU funds by Europe 2020 objectives in the framework of Partnership Agreement	% allocation of EU funds by Europe 2020 objectives under regional operational programs	% allocation of EU funds by CSF thematic objectives under regional operational programs
1. Strengthening research, technological development and innovation;	11.82		7.15	
2. Enhancing access to, and use and quality of, ICT;	3.65	SMART GROWTH 26.58	3.27	SMART GROWTH 22.19
3. Enhancing the competitiveness of SMEs, of the agricultural sector (for the EAFRD) and the fishery and aquaculture sector (for the EMFF);	11.12		11.77	
4. Supporting the shift towards a low-carbon economy in all sectors;	10.87		15.94	
5. Promoting climate change adaptation, risk prevention, and management;	1.64	SUSTAINABLE GROWTH 51.08	1.19	SUSTAINABLE GROWTH 38.85
6. Preserving and protecting the environment and promoting resource efficiency;	10.43		7.18	
7. Promoting sustainable transport and removing bottlenecks in key network infrastructures;	28.15		14.55	
8. Promoting sustainable and quality employment and supporting labour mobility;	6.58		11.00	
9. Promoting social inclusion, combating poverty and any discrimination;	7.53	INCLUSIVE GROWTH 19.08	15.71	INCLUSIVE GROWTH 35.60
10. Investing in education, training and vocational training for skills and lifelong learning;	4.75		8.88	
11.Enhancing the institutional capacity of public authorities and stakeholders and efficient public administration.	0.22		0.00	
Technical Assistance	3.25		3.36	
TOTAL	100.00		100.00	

The EU funds allocation structure, broken down by thematic objective in Poland is shown in Table 1. The structure in the framework of Partnership Agreement is compared to the allocation structure of the sum of all Regional Operational Programmes in Poland. Almost 30% of funds within PA will be allocated to thematic objective 4. The sum of funds allocated for TOs 4, 5, 6 and 7 constitutes 51% of the allocation, which is dedicated to Europe 2020's sustainable growth objective. 19% will be allocated for promoting inclusive growth (TO 8-11) and 26.5% for smart growth Europe 2020 objective. This structure of allocation under PA differs from ROPs' allocation, where 39% will be invested to achieve sustainable growth, 36% inclusive growth and 22% smart growth.

3. Comparison of the planned funds allocation under Regional Operational Programmes

Due to the comprehensive contents of the Regional Operational Programmes, an exhaustive comparison of these programs in this article is not possible. The author focused the attention on the criterion of the funds' division between intervention fields. In the following analysis of the Regional Operational Programmes in two programming periods 2007-2013[7] and 2014-2020, the following assumptions should be made:

- Since in 2007-2013 regional operational programs were financed from a single fund (ERDF) and in 2014-2020 they are dual-fund programs (ERDF and ESF) to make the comparison logical, the funds allocated within regional component of the OP Human Capital were added to the allocation within Regional Operational Programmes in 2007-2013.
- Since the breakdown of regional operational funds was based on so-called "theme dimension" in 2007-2013 and "thematic objectives" in 2014-2020 (which differ with respect to priority investments) several modifications were implemented to make the comparison possible among them. Finally, the allocation under 2007-2013 theme dimension was matched with relevant 2014-2020 thematic objectives. Additionally, the funds allocated under thematic objects 1 and 3, as well as 5 and 6, were summed).

7 The comparison of allocation structure in 2007-2013 programming period was conducted in research of Reichel and Wozniak (2010).

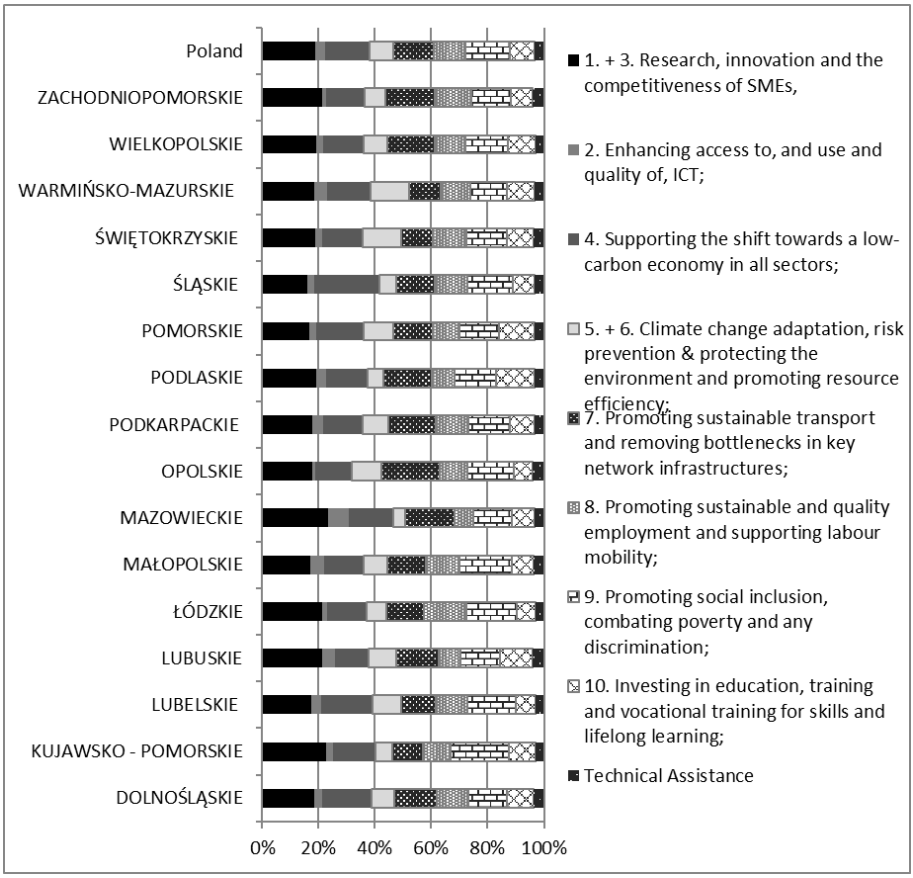

Figure 3. Allocation of 2014-2020 Regional Operational Programmes Funds broken down by Voivodships and groups of thematic objectives

In Figure 3 and 4 the allocation of ROPs in both programming periods broken down by voivodeships and groups of thematic objectives is presented. The names of thematic objectives (Figure 3) and priority themes (Figure 4) are explained in the legend. As was mentioned before the author tried to match the 2014-2020 thematic objectives with adequate 2007-2013 priority themes on the basis of categories of intervention analysis. The priority themes (or group of priority themes) were assigned to one or two thematic objectives which are shown in the legend in Figure 4.

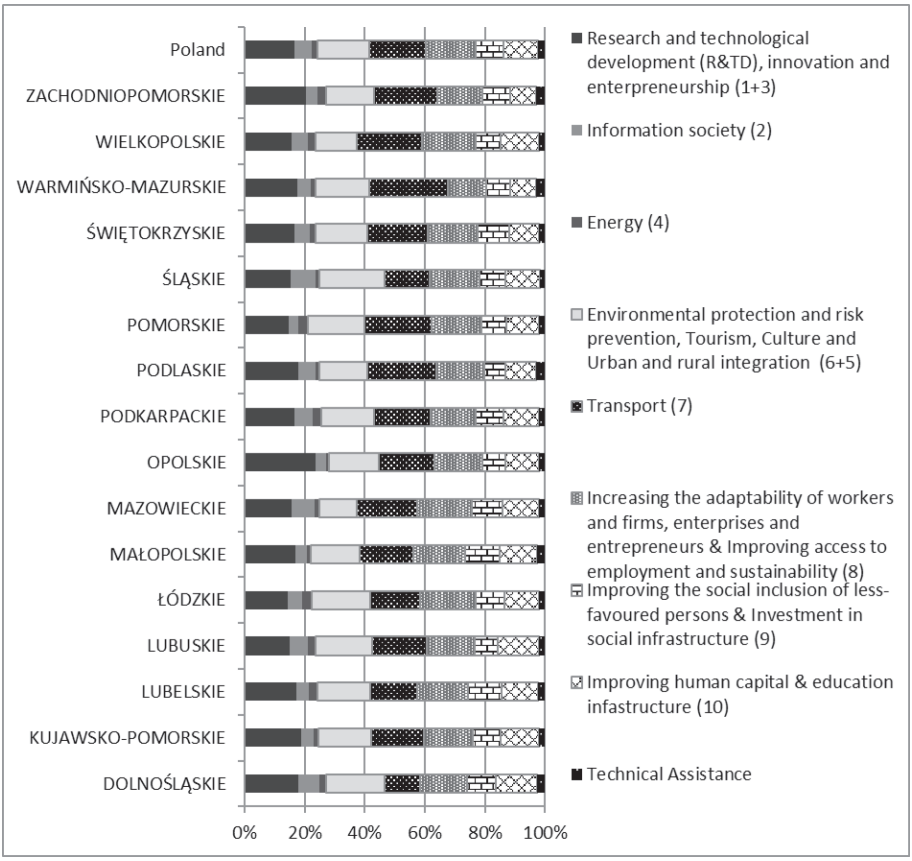

Figure 4. Allocation of 2007-2013 Regional Operational Programmes Funds broken down by Voivodships and groups of priority themes (assigned to thematic objectives)

To assess how the voivodeships differ in terms of funds allocation the coefficient of variation for each thematic objective was calculated, according to Formula (1)

$$CV = \frac{s}{\bar{x}} \qquad (1)$$

Where: s – is the standard deviation of the population (voivodeships), $\bar{x}$ – arithmetic mean of the features in a given year.

The results of the coefficient variation calculations for each intervention field in both programming periods are visualized in Figure 5. In the analysis,

it is assumed that if the value of the coefficient of variation is lower than 20% (0.2), the variations of regions in terms of funds allocation is small. If it is higher than 20% but lower than 40%, the variations are medium, if it is higher than 40% but lower than 60% the variations is large.

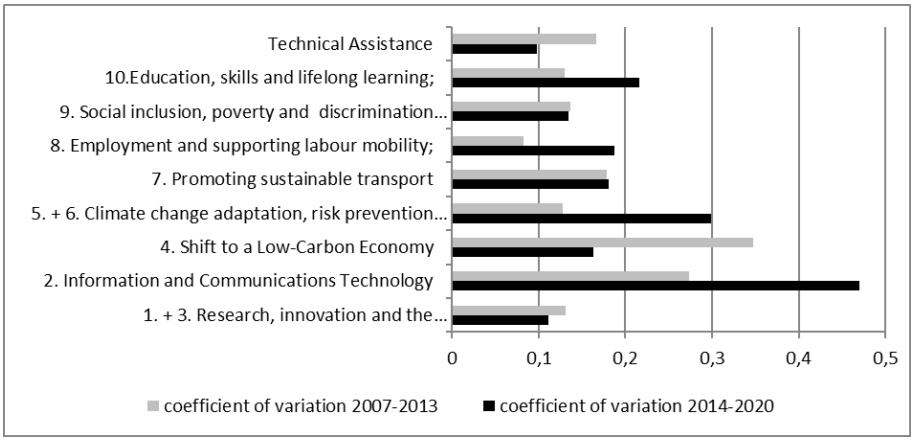

Figure 5. Comparison of coefficient of variation in voivodeships in two programming periods in terms of funds allocation

The comparison of funds allocation under Regional Operational Programmes in voivodeships and both programming periods will be based further on the data visualized in Figures 3 – 5. The average share of investments in research, innovation, and support of entrepreneurship (TO 1 and 3) is one of the highest (about 17% in 2007-2013 and 19% in 2014-2020). On average almost all voivodeships (apart from Opolskie) decided to invest relatively more in activities related to these issues in new programming period although the change is not very substantial (the increase is the highest in the case of Mazowieckie, Lubuskie, and Łódzkie). It can also be noted that regions are not highly diversified in terms of the share of planned investments in innovation and entrepreneurship in both periods (the coefficient of variation is 13% for the previous period and 11% for the current period) [8].

In the case of the investments related to the second thematic objective (information society), the decrease of share from on average 5% to 3% can be noticed (all voivodeships apart from Małopolskie plan to invest less). This trend is not similar to that observed in the country. On a national level, the share of funds dedicated for ICT developments will be even higher (the OP Digital Poland is dedicated to investments in the ICT sector). It should be

8 The influence of public support on innovativeness was discussed recently in Solesvik and Gulbrandsen (2014), Pruchnik and Toborowicz (2014)

stressed that the variation of voivodeships concerning the share of planned investments in TO 2 is quite high and increased from 27% to 47%.

Considerable increase in the share of planned allocation related to energy issues, taking into consideration all voivodeships, can be observed. In 2007-2013 programming period voivodeships intended to invest in TO 4 on average 2% and in 2014-2020 programming period about 15.5%. In the opposite direction the variation of voivodeships changed: decrease from 35% to 16%.

A significant decrease in the share of allocation for the issues connected with environmental protection and risk prevention (TO 5 and 6) can be seen. The average planned allocation in 2014-2020 taking into account all voivodeships is about 8% comparing to 17% in the previous programming period. The pattern of change was quite different in different voivodeships (the biggest change occurred in Śląskie: decrease from 22% to 6%, the smallest in Świętokrzyskie: decrease from 17% to 13%). The consequence of such change is the increase in variation of voivodeships with regards to the share of planned investments dedicated to environmental issues: increase of CV from 12% to 30%.

The only voivodeships which decided to allocate in the new programming period relatively more funds for issues connected with transport (TO 6) are Dolnośląskie and Opolskie. All other voivodeships' share of funds decreased so did the average (decrease from 19% to 15%). The variation of voivodeships with regard to the share of planned allocation for transport is small in both analyzed programming periods.

The regions are not highly diversified regarding the allocation of funds for promoting employment and supporting labor mobility under TO 8, but the increase of variation can be observed (CV grew from 8% to 19%). All voivodeships decided to invest relatively less in activities related to this issues. The highest portion of funds for TO 8 will be allocated by Łódzkie (15%), the lowest portion (almost 7%) by Mazowieckie, the only region qualified as the more developed in the 2014-2020 period.

The share of planned investments on promoting social inclusion is rather similar in all voivodeships, which is confirmed by the low CV (13%) in both programming periods. Warmińsko – mazurskie is the voivodeship with the lowest planned allocation for TO 9 (13%) and Kujawsko – pomorskie with the highest planned allocation (21%). All voivodeships decided to invest more funds in the categories of intervention connected with combating social exclusion, so the average share in Polish voivodeships increased from 9% to 16%.

In the case of the last 10th thematic objective financed under Regional Operational Programmes, namely investing in education, skills, and lifelong learning, a small decrease in the planned share of funds can be observed (the average dropped from 11% to 9%). Only three voivodeships decided to invest

more: Podlaskie, Pomorskie, and Warmińsko – mazurskie. Comparing 2014-2020 to 2007-2013 programming period with respect to the variation of shares of funds concentrated on this issue, the increase of CV from 13% to 21% is noticed.

The allocation for Technical assistance for the whole country in 2014-2020 increased to 3.36% of all funds (compared to 2.27% in the previous period) while the dispersion among voivodeships is smaller (CV decreased from 17% to 10%).

The main conclusion which can be drawn from the analysis conducted above is about the general greater dispersion of the allocation under TOs among voivodeships in the new programming period. It suggests the greatest autonomy of the regional authorities in the funds allocation planning (the needs or goals of particular voivodeships have the greatest influence on funds allocation).

The next question to be answered relates to finding any similarities or differences among voivodeships in expenditure structure. The authors aim is to group the voivodeships on the basis of the structure of intervention in delimitated areas. To achieve this goal the hierarchical cluster analysis with Euclidean distance and Ward' method of agglomeration (1963) is employed. To set the number of groups Mojena's criterion (1977) with Milligan and Cooper (1985) correction is used (Formula 2)

$$d_{i+1} > \bar{d} + ks_d \qquad (2)$$

where:
d_i – the distance among clusters;
$\bar{d}$, s_d – the mean and standard deviation of d_i
k – standard deviate, k=1,25 was adopted.

The results of grouping for the period 2007-2013 are presented in Figure 6 and Table 2. Due to the small differences among voivodeships, only two groups were identified. The first group consist of the following voivodeships: Warmińsko-Mazurskie, Świętokrzyskie, Pomorskie, Mazowieckie, Wielkopolskie, Opolskie, Zachodniopomorskie, Podlaskie. The representatives of the second group are the following voivodeships: Podkarpackie, Łódzkie, Lubelskie, Małopolskie, Kujawsko-Pomorskie, Śląskie, Dolnośląskie, Lubuskie. The main characteristic common to the voivodeships is the share of expenditures on TO Transport (high – above the mean for Poland in the first group and small – below the average in the second group).

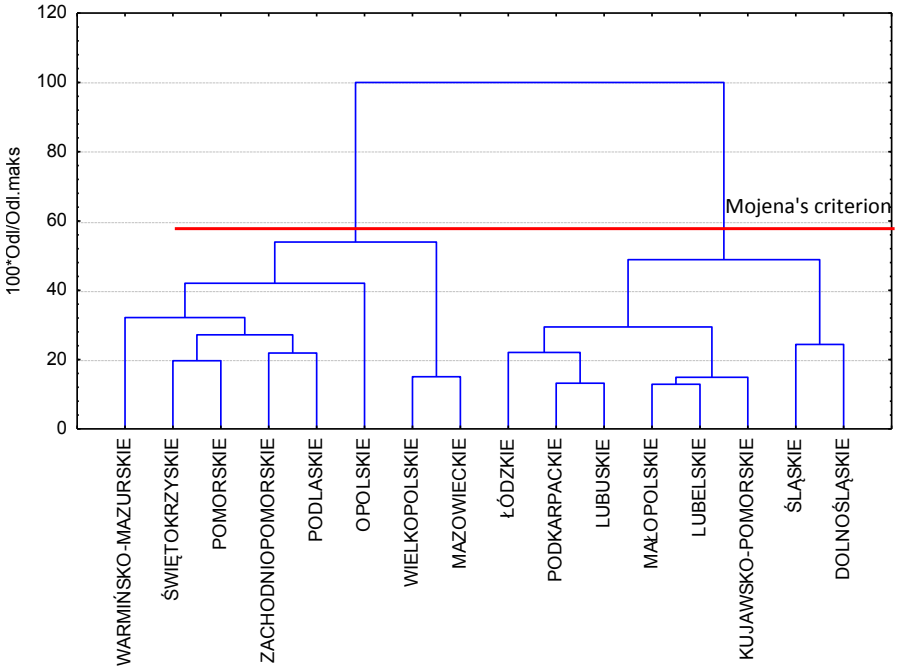

Figure 6. The results of grouping in 2007-2013

Table 2. The composition of the groups in 2007-2013

Group	Main features
Warmińsko-Mazurskie, Świętokrzyskie, Pomorskie, Mazowieckie, Wielkopolskie, Opolskie, Zachodniopomorskie, Podlaskie,	High share: • Transport (besides Opolskie)
Podkarpackie, Łódzkie, Lubelskie, Małopolskie, Kujawsko-Pomorskie, Śląskie, Dolnośląskie, Lubuskie	Small share: • Transport (besides Podkarpackie)

The results of grouping for the period 2014-2020 are presented in Figure 7 and Table 3. In relation to the bigger disparities among voivodships in terms of expenditure structure, three groups were identified. The first group consist of the following voivodeships: Mazowieckie, Wielkopolskie, Zachodniopomorskie, Opolskie, Dolnośląskie Podlaskie, Podkarpackie, Lubuskie. There are only three representatives of the second group: Warmińsko-Mazurskie, Świętokrzyskie, Pomorskie. The third group is represented by Łódzkie, Lubelskie, Małopolskie, Kujawsko-Pomorskie, Śląskie. The main characteristics common to each group are described in Table 3.

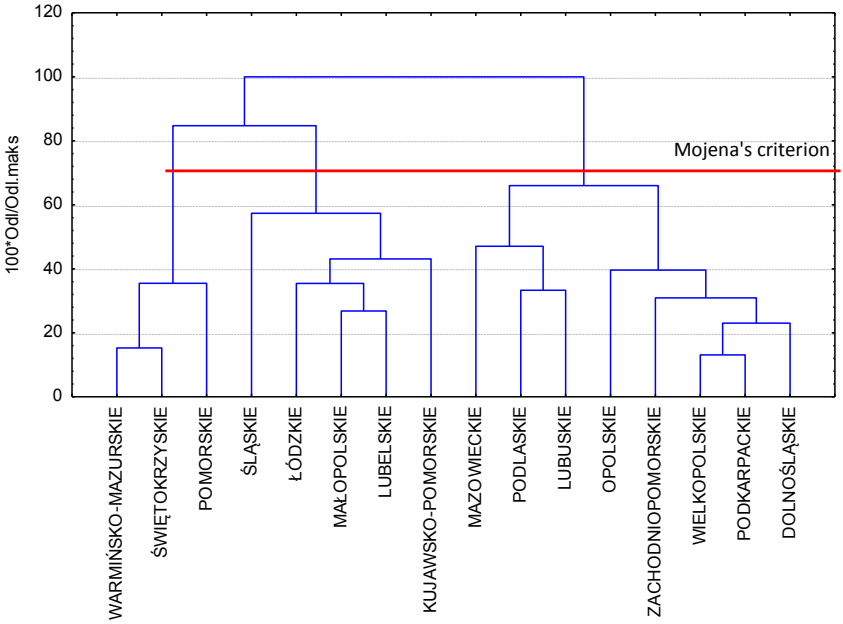

Figure 7. The results of grouping in 2014-2020

Table 3. The composition of the groups in 20014-2020

Group	Main features
Mazowieckie, Wielkopolskie, Zachodniopomorskie, Opolskie, Dolnośląskie Podlaskie, Podkarpackie, Lubuskie,	Small shares: • Supporting the shift towards a low-carbon economy in all sectors (besides Dolnośląskie) • Promoting social inclusion, combating poverty and any discrimination (besides Opolskie) High shares: • Promoting sustainable transport and removing bottlenecks in key network infrastructures,
Warmińsko-Mazurskie, Świętokrzyskie, Pomorskie,	Small shares: • Research, innovation and the competitiveness of SMEs • Promoting sustainable transport and removing bottlenecks in key network infrastructures • Promoting social inclusion, combating poverty and any discrimination; High shares: • Climate change adaptation, risk prevention & protecting the environment and promoting resource efficiency, Investing in education, • Training and vocational training for skills and lifelong learning,
Łódzkie, Lubelskie, Małopolskie, Kujawsko-Pomorskie, Śląskie,	Small shares: • Promoting sustainable transport and removing bottlenecks in key network infrastructures High shares: • Climate change adaptation, risk prevention & protecting the environment and promoting resource efficiency

4. Conclusions

The aim of this paper was to compare the allocation of EU cohesion policy funds under Regional Operational Programmes in two programming periods and find the groups of similar voivodships in terms of planned funds allocation.

First of all the amount of funds which allocation is the responsibility of regional self – governments increased in nominal and relative terms (as% of all EU funds in Poland). The analysis of data also shows that the pattern of funds distribution changed with respect to the thematic objectives. On average voivodeships plan to invest in the new programming period relatively more on issues connected with energy and social inclusion and less on environment protection issues. The analysis of the coefficient of variation for voivodeships on the basis of the share of fund allocation planned for thematic objectives, suggests that voivodeships are more diversified in terms of expenditure structure. The similar conclusions can be drawn from the cluster analysis. It suggests the greater autonomy of the regional authorities in the funds allocation planning in 2014-2020 in comparison to the previous programming period (the needs or goals of particular voivodeships have the greater influence on funds allocation).

The delimitation of the groups of voivodeships forms the next research questions about the reasons for such similarities in the expenditure structure. The factors determining the funds allocation are not explained in this paper and require further studies.

References

Churski, P. (2008). *Czynniki rozwoju regionalnego i polityka regionalna w Polsce w okresie integracji z Unią Europejską*. Poznań: Wydawnictwo Naukowe UAM.

Gilowska, Z., Gorzelak, G., Jałowiecki, B., & Sobczak, K. (1998). Kierunki polityki regionalnej Polski. *Studia Regionalne i Lokalne, 24*(57).

Gorzelak, G. (2007). Rozwoj – region – polityka. In: G. Gorzelak, A. Tucholska (Eds.). *Rozwoj, region, przestrzeń*. Warszawa: Ministerstwo Rozwoju Regionalnego.

Milligan, G. W., & Cooper, M. C. (1985). An examination of procedures for determining the number of clusters in a data set. *Psychometrika*, *50*(2), 159-179.

Mojena, R. (1977). Hierarchical grouping methods and stopping rules: An evaluation. *The Computer Journal*, *20*(4), 359-363.

National Development Strategy 2020: Active society, competitive economy, efficient state (NDS 2020). Adopted by the Council of Ministers on 25 September 2012.

Poland National Strategic Reference Framework 2007–2013 in support of growth and jobs, 2007. Warsaw: Ministry of Regional Development.

Programming of the 2014-2020 Financial Perspective – Partnership Agreement with Poland. (2014). Warsaw: Ministry of Infrastructure and Development. Retrieved from http://www.mos.gov.pl/g2/big/2015_06/34e5cee161a695635df82bfe62c33192.pdf

Pruchnik, K., & Toborowicz, J. (2014). Low level of innovativeness and the middle income trap – Polish case study. *Journal of Entrepreneurship, Management and Innovation*, (*2*)10, 141-157.

Reichel, M., & Wozniak, D. (2010). Regionalne programy operacyjne – próba porównania struktury wydatków. In: B. Jóźwik, P. Zalewa (Eds.). *Spójność ekonomiczno-społeczna regionów Unii Europejskiej*. Lublin: Wydawnictwo KUL.

Solesvik, M., & Gulbrandsen M. (2014). Interaction for innovation: Comparing Norwegian regions. *Journal of Entrepreneurship, Management and Innovation*, (*3*)10, 7-28.

Sokołowska-Woźniak, J. (2013). Knowledge economy policy in Polish regions. *Studia Regionalia*, 129-147.

Sokołowska-Woźniak, J., Woźniak, D. (2008). Cele Strategii Lizbońskiej w regionalnych programach operacyjnych. In: A. Nalepka (Ed.). *Organizacje komercyjne i niekomercyjne wobec wzmożonej konkurencji oraz wzrastających wymagań konsumentów*. Nowy Sącz: Wyższa Szkoła Biznesu National – Louis University.

Ward Jr, J. H. (1963). Hierarchical grouping to optimize an objective function. *Journal of the American statistical association*, *58*(301), 236-244.

Others

Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines, 2007-2013. (2005). Communication from the Commission COM(2005) 0299, Brussels.

Europe 2020. A strategy for smart, sustainable and inclusive growth. (2010). Communication from the Commission, COM (2010) 2020 final of 3 March 2010. Brussels.

Common provisions regulation (CPR) No. 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) *No. 1083/2006*, OJ 2013 L 347/320, 20.12.2013.

Council Regulation (EC) No. 1083/2006 of 11 July 2006 laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No. 1260/1999. OJ 2006 L 210/25, 31.7.2006.

Council Regulation (EU, EURATOM) No. 1311/2013 of 2 December 2013 laying down the multiannual financial framework for the years 2014-2020, OJ 2013 L 347/884, 20.12.2013.

Elements for a Common Strategic Framework 2014 to 2020 the European Regional Development Fund the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund, Commission Staff Working Document, 14.3.2012 SWD(2012) 61 final, Brussels: European Commission.

Position of the Commission Services on the development of Partnership Agreement and programmes in Poland for the period 2014-2020. (2012). European Commission.

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THE IMPLEMENTATION OF EMIR (EUROPEAN MARKET INFRASTRUCTURE REGULATION) AND ITS INFLUENCE ON DERIVATIVES MARKET IN POLAND IN 2010–2014

***Karolina Antosik*[1]**

Abstract
The article presents the analysis of the changes of derivates market structure in Poland before and after the implementation of regulations on OTC derivatives market, which was imposed in EU by EMIR (European Market Infrastructure Regulations). That was implemented by EU Parliament and EU Council ordinance No. 648/2012 dated on the 4th of July 2012, on the derivatives being the subjects of trade outside of the regulated market, central counterparties and transactions repository. The article describes the origin of the world financial crisis in 2008 as well as regulations which were published 2010-2012 in USA and EU aiming to reduce the possibility of critical situations occurrence in following years. Furthermore, Poland's most popular OTC derivatives and local derivatives regulations have been characterized in the paper. The assessment of introducing in 2012 regulations on OTC and its value structure has been performed.
Keywords: *derivatives, OTC, CCP, Dodd Frank, EMIR.*

1. Introduction

For over a dozen years a constant growth of transactions in the derivatives market has been observed, reaching in 2013 the value of approximately USD 2 trillion worth daily transactions on the global interest rates market. According to research published by the Bank for International Settlements the nominal value of derivatives traded outside of stock exchange markets reached the value of USD 700-800 trillion, which is more than the entire GDP of the whole World. Lack of transparency and insufficient regulations of the OTC (over the counter) derivatives market, caused mainly by its decentralized characteristics and the ease of signing these contracts, resulted in an incorrect assessment of

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exposure to risk for counterparties and fueled deepening disorders on financial markets in 2008–2009.

The most significant for OTC derivatives market are following regulations:

- EU Parliament and EU Council ordinance No. 648/2012 dated on the 4th of July 2012, on the derivatives being the subjects of trade outside of the regulated market, central counterparties and transactions repository in EU area as well as the local, Polish regulations:
- the act on financial instruments trading (enacted by the Lower House of the Parliament of Poland on the 28th of June 2012, signed by the President of Poland on the 11th of July, coming into power starting from the 4th of August 2012),
- the act changing the act on financial instruments trading enacted by the Lower House of the Parliament of Poland end of October 2012 and signed by President of Poland on the 30th of November 2012, coming into force starting from the 26th of December 2012.

Considering the importance of the subject, mentioned above regulations have been covered by the analysis in the article and presented respectively in section 2 and 3. Introduced regulations aimed, *inter alia*, to restore clients' trust to derivatives being the subject of trade outside of regulated markets. In the article the analysis of the value structure changes of derivatives in Poland has been performed by focusing on the situation before and after introducing regulations on OTC derivatives, basing on research published by Central Statistical Office (GUS). The analysis covers years 2010–2014. The primary goal of the paper is to check if, and if so how, the implementation of EMIR regulations, introduced after the financial crisis in 2008, influenced the change of derivatives' structure value compared to the situation before introducing EMIR regulations.

The article consists of following sections. Section one is an introduction. Section two is a characteristic of OTC derivatives market regulations changes caused by the financial crisis in 2008. Section three is a description of the EU's regulations implementation to Polish law. Section four presents an analysis of derivatives' value structure changes in Poland before and after introducing EMIR regulations on OTC derivatives. The last one shows benefits for Polish market participants from EMIR regulations implementation to local laws and their influence on derivatives' value structure changes in Poland in years 2010–2014.

2. The reform of regulations for derivatives

The derivative has been defined as a contract, which market price depends directly or indirectly on the price or value of securities, which are the base financial instruments for derivatives (Kudła, 2009). These are also other

contracts, which value directly or indirectly depends on the exchange rate or interest rates changes.

The derivative is a financial instrument, which is fulfilling the following criteria (Jajuga, 2009):

- its value depends on certain interest rate, security price, stock price, exchange rate, index based on price or interest rate, or other variables,
- doesn't require any initial payment or require only a little, compared to the contract value, initial investment,
- its settlement is due in the future.

The link between derivatives value and the value of base financial instruments is considered as the main feature of derivatives (Tarczyński & Zwolankowski, 1999), however, determining derivative value by the value of a base instrument is key for this dependency. Everything that has a value can be the underlying asset provided that the value is changing over the time. The underlying asset variation over the time is linked with the necessity of uncertainty occurrence when it comes to the value of an underlying asset at a certain time in the future. Hence, the underlying asset for derivatives can be securities, currencies, interest rates, stock exchange indexes and stocks.

Certain derivatives vary from each other due to features representing. When selecting certain criteria you can obtain different classifications of derivatives. The most famous distinction of derivatives based on the content of rights and obligations implicated by certain derivative enables to distinguish forward contracts, options, and swaps (Gorzelak, Barciszewska, Barciszewska & Rogalski, 2011, p. 58). The most popular in Poland derivatives include forward contract, futures contract, swaps and options (Goławska-Witkowska & Rzeczycka, 2009, p. 45).

The reform of legislation on derivatives was one of the consequences of the global crisis in 2008. The immediate cause was the collapse of the functioning of the global financial system, which has occurred since mid-2007, due to earlier upbeat trend in the mortgage market in the United States. Banks in the United States were lending at high risk of repayment, even to those with insufficient financial credibility (subprime mortgage – in Polish naming without having creditworthiness). These loans were used as insurance for structured bonds and massively sold for investment and speculative purposes by private financial institutions, including the largest US and European banks. Awareness of the risks associated with the functioning of these bonds was low because an artificially induced increase in real estate obscured the true real picture, and the leading rating institutions did not signal the danger, assessing these bonds highly safe. This lack of creditworthiness of some debtors was reflected in the lack of repayment of their liabilities in a high proportion (9.2%), which consequently led to a lack of cash in the credit market and resulted in

instability of these institutions. Other causes included the use of securitization and credit derivatives for the distribution of risk and a significant amount of market transactions excluded from the supervision, creating an alternative banking system (shadow banking system). The importance of derivatives was revealed at the beginning of the mentioned financial crisis in 2008. According to economists, OTC derivatives, especially credit ones, played an important part in the dissemination of the last financial crisis. The reason for that was their bilateral nature and a high degree of complexity, and above all the lack of transparency in the primary exposure of market participants. As a consequence of above facts, banks announced job reductions – for example in the UK only between the year 2008 and 2009 tens of thousands of financiers lost their jobs. In the second half of 2008, the decrease of lending by banks influenced on the collapse of car retail, financed mainly by loans. The biggest car manufacturers such as Chrysler, General Motors, Ford, and Volkswagen reduced their staff significantly. Thus, the financial crisis caused economic crisis overall. Predictions of upcoming recession have deepened the shares price drop on all stock exchanges.

Although the global crisis of 2008 did not create such severe consequences in Poland, Polish banks fearing of falling real estate prices have significantly reduced lending. Declines in stock prices occurred on the local stock exchange. Losses on currency options market in Poland contributed to reducing the interest and involvement of non-financial companies on the derivatives market. In 2009 most of the previously concluded agreements for currency options already expired, and entering new transactions was substantially reduced. According to the data (Polish National Bank, 2011), the value of currency derivatives trading in 2009 dropped by 40% compared with 2008, while the value of currency options transactions fell by nearly 70%.

Responding to the global crisis, leaders of G-20 countries participating in the summit, taking place in Pittsburg on September 2009, called to reform the infrastructure of OTC derivatives markets, in order to introduce supervision over the systemic risk which can be caused by those instruments and limitations of the risk. Lehman Brothers collapse had a direct influence on taking mentioned actions.

The United States as the first responded to the Pittsburg summit participants' call and within less than a year issued new regulations, gathered in the act written by congressmen Chris Dodd and Barney Frank, known as Dodd-Frank Act. The law was signed by the President of USA in July 2010, and its command was introduced until the end of 2011. The purpose of the act is to regulate Banks and Financial Institutions operations including (Staszewska, 2014):

- limitations of banks' risky activities,

- creating a new agency responsible for consumers' protection from so-called "predatory lending" (unjust and unfair crediting practices) and other unfair practices,
- derivatives market regulations,
- agreeing on the lead role of Federal Reserve in supervising law compliance,
- obligation towards banks to meet more strict capital requirements,
- introduction of regulations enabling regulators to take over as well as liquidate huge banks which could fall into trouble.

The Dodd-Frank bill imposes supervisor as well as decisions maker role regarding clearing contracts through CCP on CFTC – the federal agency in the USA controlling American forward contracts market. The Dodd-Frank bill in the area of OTC derivatives infrastructure perceives obligatory centralization of standard derivatives transactions calculations by the Central Counterparty Clearing House (CCP) and requires that all transactions, performed by CCP as well as others, are known to authorized transactions repository. The Dodd-Frank Act, apart from regulations for OTC derivatives market, introduces additional institutions for monitoring and preventing additional systemic risk – Stability Oversight Council and Office of Financial Research, and customers financial supervision as a part of Consumer Financial Protection Bureau.

In EU EMIR regulation came into force. It was introduced through ordinance of the EU Parliament and the EU Council ordinance NR 648/2012 dated on the 4th of July 2012 on the derivatives being the subjects of trade outside of the regulated market, central counterparties and transactions repository. The essential part of the new regulation is focused on derivatives. Based on point number 53 of the preamble to MFID directive and comments from European Commission articulated in concluded public consultations regarding amending the directive, we can understand this term as bilateral transactions usually exceeding the current market volumes, conducted irregularly on an ad-hoc basis between wholesale counterparties without the engagement of formalized transaction system.

It is worth to highlight records of articles 4, 9 and 14 of the quoted ordinance NR 648/2012. Article 4 introduces an obligation for clearing all derivatives contracts being subject to the OTC trade and also part of derivatives classes accepted by ESMA as due to be cleared. Article 9 puts an obligation of providing detailed information about every signed derivative contract and all changes or cancellation of the contract to the transactions repository. Article 14 introduces permission for running CCP. In case a legal entity having headquarters in EU is planning to provide clearing services as CCP, it issues an application for permission to a respective unit of EU member

state, where it is located (unit respective for CCP) following the procedure indicated by ESMA.

Other than that, EMIR recommends the increase of operational requirements and cautions for CCP and highest possible transparency of operation processes, through an introduction of procedures for identification and solving potential conflicts of interests referring to the ownership of CCP. Increasing standards of caution consists of increasing essential capital requirements, introducing necessary compensation funds (which all board members will be paying a fee to) and on an appropriate segregation of counterparties assets – these actions are due to ensure fluidity for the clearing house in case of bankruptcy of one of its members. Selected dispositions refer to CCP acting on the market for OTC derivatives, as well as clearing houses reconciling instruments being subject to trade on primary markets.

Ordinance (UE) 648/2012 – EMIR presented an obligation to clear certain classes of derivatives contracts on interest rates (Interest Rate Swap, Forward Rate Agreement), denominated in Polish PLN as well as Swedish SEK and Norwegian NOK. Two classes of forward contracts cleared in PLN were supposed to fall under obligation for central clearing: IRS fixed-to-float, for which the benchmark index is WIBOR – with maturities of 10Y and 28D-FRA contract, for which the benchmark is WIBOR – with a maturity of 3D-2Y. Based on mentioned above ordinance (UE) 648/2012 dated on the 10th of November 2015, ESMA published an appropriate project of the technical standards. The introduction of obligation for clearing is in the European Commission and European Parliament competency, and the decision should be made still in 2016. EMIR introduces an obligation for clearing some classes of OTC derivatives through specialized entities – clearing houses (CCP) and reporting about derivatives transactions to so-called transactions repositories. Clearing OTC derivatives through CCP aims to reduce the risk of default on transactions obligations by engaged parties. Because of expectations and responsibilities required from the central counterparty (CCP), EMIR Regulation puts in front of it certain qualitative and quantitative requirements. These requirements include a permanent and disposable capital of at least EUR 7.5 million and the collateral structure, set by the parties to the transaction towards securing the contract settlement, in the form of liquid assets (including cash, gold). Also to have additional funds that could constitute protection in the event of failure to comply with the terms of the contract by any of the parties.

It should be noted that the EMIR regulation, in principle, will not apply to non-financial counterparties (corporate), except in cases where their positions on OTC derivatives will be considered significant, or when they have systemic importance. Publication Ordinance EMIR took place on 27 July 2012 and entered into force on 16 August 2012.

3. Implementation of the solutions to Polish law order

The arrangements set out (imposed) by the EMIR regulation has been introduced in a very short period to Polish legislation, namely the Parliament on 28 June 2012 passed the amendment to the Act on trading in financial instruments and to many other laws, including the Civil Code. This law, signed by the Polish President on 11 July 2012, was published on 20 July 2012 and came into force on 4 August 2012. This Act introduces the Polish law the institution of the so-called novation settlement.

The concept of "novation" (Latin novatio), otherwise called the "renewal," operates in the Polish legislation and is contained in the Article 506 in section obligations of the Civil Code. The said Article 506 §1 states: "if for obligations' release purposes the debtor agrees, with the consent of the creditor, to satisfy other obligation or even the same obligation, but based on a different legal basis, current obligation expires (renewal)." The purpose of an requirement is to meet the interests of the creditor. Renewal, known as novation, is one of the ways for expiration liabilities. As a rule, liability is extinguished when performed in line with its contents. However, the obligation may terminate in other means, including by satisfying the interests of the creditor (may also be terminated without his satisfaction, e.g. relief from debt). One of those ways for an expiration of the liability is renewal (novation).

In relation to trading in financial instruments, clearing novation consists of the settlement of the previously, already concluded, transactions by a third party, i.e. a central counterparty (CCP), that enters in the liabilities of the original parties to the transaction. Thus, already known in Western Europe accounting standards took effect in Polish law, adapting them to the requirements of the Regulation of EMIR in the area of settlement of OTC transactions.

Based on the new regulations a central counterparty in settlement of transactions, will be ascending to the rights and obligations of the parties to the transaction while quenching created mutual obligations of the parties. In practice, this means that instead of a single contractual relationship, two relationships of requirements exist and in each one, one of the parties will be central counterparty (Stanek, 2012). For the buyer, it will be a party to the customer, while for the retailer it will be a buying party. Central counterparty will be responsible for the settlement of the contract, which should, on the one hand, reduce individual credit risk, on the contrary, should guarantee the smooth settlement.

Another legislative action in the field of trading in financial instruments was the amendment of the Act on Trading in financial tools and other acts passed by the Parliament at the end of October 2012, which on November 30,

2012, the President of Poland signed. The new rules apply from 26 December 2012.

The Act implements Directive 2010/78 / EU, which increases the integration of financial supervision in Europe and the security of the financial market. It designs cooperation and exchange of information between the Financial Supervision Commission (KNF) and the European System of Financial Supervision (ESFS) responsible for the following sectors: banking, insurance, occupational pensions, and securities. ESFS is functioning in the EU since 1 January 2011. It consists of the European Banking Authority, European Insurance and Occupational Pensions Authority and the European Securities and Markets Authority. The law, among other things, imposes on the KNF obligation in particular to notify the competent European supervisory authority, about issued or withdrawn authorizations concerning the pursuit of activities in the financial market and the cases of refusal to issue such a permit. In addition, the KNF will provide the European Supervisory Authority Securities and Markets Authority and the supervisory authorities of the regulated markets in the other Member States with a list of the regulated markets operating on Polish territory.

In the framework of consolidated supervision, KNF will also be able to take over the tasks of the other surveillance authority of EU Member State or delegate them towards the other authority. To protect the public interest, KNF will be able to suspend (for a period not longer than one month) the ability to perform, in whole or in part, the brokerage or custody on Polish territory by a foreign investment firm. At the same time informing the European Commission, the European Supervisory Authority Securities and Markets Authority and the competent supervisory authority in another Member State which granted the authorization to a foreign investment company. The law also allows the Financial Supervision Authority to conclude agreements with the competent supervisory authorities of other countries specifying the scope and mode of cooperation in the exercise of consolidated supervision over banks operating in groups, supervision of important branches of domestic banks and the relevant branches of credit institutions, while informing the European Banking Authority on the concluded agreements and their contents.

National Depository for Securities (KDPW) for several years carried out projects aiming to improve the safety of the Polish market and create conditions to make it competitive. As a result in 2010 KDPW created the so-called "Guarantor settlements", which was provided with the capital of PLN 60 million, with the task of supporting the liquidity of the system of settlements. After that, in 2011, on the basis of the Guarantor settlement, a clearing house called KDPW_CCP was established, characterized by a new settlement guarantee system. The clearing house had equity of PLN 100 million. In 2012,

the house' capital was increased by another PLN 100 million to PLN 200 million. On 19 December 2012 Financial Supervision Commission approved the terms of the settlement of transactions (turnover unorganized). The content of the regulations was made available on the website of the National Depository for Securities (KDPW). Regulations came into force on 2 January 2013. From that day onwards clearing KDPW_CCP launched the settlement of transactions in OTC clearing system and applied for authorization under EMIR to the Financial Supervision Commission.

With the introduction of accounting services for derivatives and OTC transactions Polish market is ready to meet the requirements of the Regulation of the European Parliament and the Council on derivatives traded outside the regulated market, central counterparties and trade repositories (EMIR). KDPW_CCP is a modern clearing house for settlement of transactions and performs clearing using a number of mechanisms to reduce the systemic risk of default parties from obligations transactions. Novation will make KDPW_CCP enter into the rights and obligations arising from transactions accepted for settlement. As a result of using new tools – in particular – netting in financial instruments, the development of the clearing guarantee system and the participation of KDPW_CCP in securities lending as a guarantor for repayment of the loan, KDPW_CCP is prepared to take effective competition with other clearing houses operating at the moment in Europe. The use of standardized solutions to the functioning of the clearing house KDPW_CCP enables dynamic development of both the scope and area of services.

Creation of KDPW_CCP affected the position of the Polish capital market internationally and has been positively assessed by the rating agencies (in particular due to reduced counterparty risk) due to the implementation by Poland of international standards in this field. The changes have also been strongly supported by the environmental infrastructure of the Polish financial market. The result is an improvement in the perception of Polish capital market infrastructure by foreign and Polish financial institutions. Creation of KDPW_CCP was preceded by the release of the Financial Supervision Commission decision, approving the location of the KDPW_CCP capital in the system of clearing liquidity transactions and limiting obligations of the clearing, following the additional payments to the settlement fund. The capital of KDPW_CCP can be used to support the liquidity of the clearing of transactions concluded on the regulated market. At the moment of creating KDPW_CCP, important features were provided by the entity, which acts as a clearing house.

KDPW_CCP is legally separate, as according to international standard and due to the different nature of the risks associated with the provision of CCP clearing, and risks arising from the core business of the central securities

depository (KDPW). It was necessary to isolate it as a separate legal entity, which tasks will be to provide services of settlement house.

An significant advantage of KDPW_CCP has assets that can be used as part of the clearing guarantee system, thus improving the security of settlements. KDPW_CCP is equipped with a capital of PLN 200 million (approx. EUR 50 million), which can be used as part of the clearing guarantee system, becoming one of the system resources.

Calling KDPW_CCP allowed limiting the maximum additional contributions to the clearing fund at the level of 110% of the fundamental contribution of a participant. The limit allows participants to assess the risk associated with participation in the clearing guarantee system.

Settlement of OTC derivatives by clearing them through CCP aims primarily to reduce the risk of default.

Transaction clearing through a CCP concerns both financial institutions and non-financial institutions, yet for non-financial institutions determines the so-called materiality threshold, which, depending on the type of transaction is EUR 1 to 3 billion (Baranowska-Skimina, 2012). Certain thresholds are on the one hand to ensure control of the derivatives market, on the other hand however not to impose on the enterprises labor-intensive and costly requirements that are not adequate to the scale of operations.

4. The analysis of derivatives' value structure changes in Poland before and after introducing EMIR regulations on OTC derivatives

The introduction of the settlement of OTC transactions through a central counterparty has lead in micro scale to minimize the individual credit risk of the participating parties, while at the macro scale to defend systemic risk, resulting in the lack of settlements for this type of transactions. Analysis of changes in the structure of the derivatives in Poland covers the years 2010-2014. Selected years of exposure include two years (2010 and 2011) preceding the implementation of the EMIR regulation on OTC derivatives, and two years (2013 and 2014) after the introduction of this regulation.

According to the Central Statistical Office (GUS) records of derivatives held by non-financial institutions (Non-financial Counterparties), the research conducted in the years 2010 and 2011 involved 1,292 entities. Indicator of the analysis completeness (i.e. the ratio of the number of reports and the number of companies required to testify) amounted to 96.6%. Among the companies participating in the survey was 461 subsidiaries in the group, that did not file a detailed report and in accordance with the methodology of the study were not included in further analysis. The analysis included 831 entities, of which 566 parent companies in the group, and 265 enterprises operating independently.

As of 31 of December 2011 on the side of the nominal value of the assets and balance sheet derivatives showed 148 enterprises, of which 96 parent companies in the group and 52 companies operating independently. On the liabilities side – respectively 177 entities, of which 117 the parent companies in the group and 60 companies acting alone.

According to GUS records, providing data for 2013, 1382 subjects participated in, of which 521 companies were operating alone, 330 parent organizations in the group, 349 subsidiaries and 182 both dominant and dependent. Indicator of the analysis completeness (the ratio of the number of reports to the number of entities required to testify) amounted to 97.6%.

According to GUS data on derivatives of non-financial enterprises for 2014 from 1404 entities (of which 501 companies operating alone, 306 parent companies in the group, 403 subsidiaries and 194 both parent and subsidiaries) surveyed. The value of derivative instruments in assets at the end of the year 2014 presented 306 entities, and in liabilities – 340. Indicator of the analysis completeness (the ratio of the number of reports to the number of entities required to testify) amounted to 98.5%.

Table 1 presents the value of derivative instruments held by companies participating in the study in years: 2010 and 2011 as well as 2013 and 2014.

Table 1. The value of derivative instruments of companies in Poland participating in the study Central Statistical Office (GUS) in 2010, 2011, 2013 and 2014

	Derivatives in year							
	2010		**2011**		**2013**		**2014**	
Detailed	**[PLN m]**	**[%]**	**[PLN m]**	**[%]**	**[PLN m]**	**[%]**	**[PLN m]**	**[%]**
Assets total, out of which:	**2857.7**	**100.0**	**4230.1**	**100.0**	**5 671.3**	**100.0**	**5 792.5**	**100.0**
forward contracts	969.3	34.0	1356.4	32.1	2 852.0	50.3	3 843.8	66.4
futures contracts	4.3	0.1	9.2	0.2	11.8	0.2	97.0	1.7
options	1470.9	51.4	2223.4	52.6	958.9	16.9	540.3	9.3
swap contracts, out of which:	393.7	13.8	606.4	14.3	1 803.1	31.8	1 255.1	21.7
CIRS	73.3	2.6	181.8	4.3	29.2	0.5	377.2	6.5
Other derivatives	19.6	0.7	34.7	0.8	45.4	0.8	56.3	1.0
Liabilities total, out of which:	**5262.7**	**100.0**	**6255.3**	**100.0**	**3 510.2**	**100.0**	**7 740.5**	**100.0**
forward contracts	623.5	11.8	1772.9	28.3	1 730.3	49.3	3 268.9	42.2
futures contracts	41.3	0.8	28.7	0.5	20.8	0.6	9.0	0.1
options	2124.9	40.4	1058.4	16.9	93.4	2.7	251.3	3.2
swap contracts, out of which:	2406.9	45.7	3319.2	53.1	1 501.1	42.8	3 754.9	48.5
CIRS	1771.7	33.7	2730.7	43.7	355.8	10.1	156.6	2.0
Other derivatives	66.3	1.3	76.0	1.2	164.7	4.7	456.4	5.9

Source: Own study based on GUS survey conducted for the years 2010 and 2011, and 2013 and 2014 (Central Statistical Office, 2015).

On the basis of the data contained in Table 1, it can be observed that the value of derivative instruments in the assets of the analyzed companies is characterized by an upward trend throughout the period considered. Before the introduction of legislation EMIR highest share in the assets of derivatives have options – more than 51% and forward contracts – more than 32%. However, after the introduction of legislation EMIR, in the assets a significant increase in the share of forward contracts (almost double) can be observed, while an even more significant (3-5 times) drop in the participation of options. Additionally, at the outflow of the share of options, increase in the share of swap should be noted, which exceeded the share of options twice. In addition, other derivatives showed an upward trend in the coming years of exposure, although to a subtle extent. The share of derivatives in liabilities of analyzed enterprises is characterized by the occurrence of 44% drop in the first year after the introduction of regulation EMIR and 200% increase in the second year after the EMIR regulation. Before the introduction of EMIR legislation, the highest share in derivatives' liabilities were swap contracts – about 50% and options – about 30%. However, after the introduction of EMIR legislation, in the liabilities, a small (about 5%) decrease in the share of swap can be observed, while at the same time a very significant (several times more) decline in the share of options. Additionally, at the outflow of the share of options, an increase in the share of forward contracts should be noted, which exceeded more than ten times the share of options. Furthermore, several percent upward trends after the EMIR regulation showed other derivatives.

5. Conclusions

Fulfilling by Poland the requirements of the Regulation of the European Parliament and the European Council on derivatives traded outside the regulated market, central counterparties and trade repositories (EMIR) has brought positive results. For central counterparty, it enabled the collection and recording of information about market participants, transactions concluded on the market and the associated risks. This has led to defining the standards for individual products, the creation of a trade repository, that market regulators could access to make research and analysis, and ultimately take action to reduce adverse events, including reducing the risk. Another positive effect for polish clearing house was to cooperate with foreign CCPs and central depositories. Market participants from now on can obtain information from a central counterparty on other participants and market transactions, enabling business decisions to be based on the evaluation of existing risk. In addition, by guaranteeing transactions accepted for settlement by the clearing house – KDPW_CCP counterparties may increase the effectiveness of risk

management, and use the process of clearing and settlements in accordance with international standards. Market regulators have access to a trade repository, therefore, can take action to reduce adverse events, including a reduction of the risk of the transactions, thanks to the possibilities of research and analysis on the basis of information obtained from the trade repository. The introduction of the said regulation has led to the improvement of perception of Polish capital market infrastructure by Polish and foreign financial institutions, and as a consequence to increase interest in the Polish capital market. It increased polish credibility on the international arena because of the quality of post-trading services in now present Poland.

On the basis of studying the structure of derivative in financial enterprises in the years 2010-2014, the two years before the EMIR legislation concerning the derivatives market, implemented into domestic law Two years after the introduction of these regulations, it can be stated that the implementation of EMIR regulation to the local law has contributed to changes in the structure of derivatives, including the very important (from several times in the assets to tens times in liabilities) reduction of the share of options, replacement of options by swaps in assets and forward contracts in liabilities, as well as the doubling of the share of swap transactions in assets.

Lack of implementation of the relevant services on the domestic market of derivative instruments, such as trade repository, clearing, settlement of OTC derivatives, which services can now be carried out by a domestic entity. This would lead to the need for the national market participants to use the offer of foreign entities, which would entail additional costs. KDPW_CCP clearing house settles and guarantees the settlement of transactions concluded on the Polish capital market. For example, only in 2013, the value of settled transactions exceeded PLN 616 billion, and the number of billable transactions came to the number of 20 million. Imposing on participants of the derivatives market additional duties created for them some inconvenience, but nonetheless, it will improve transparency and limit risk exposure of the main participants and transactions on the market (repository market transactions). Appointment of Polish clearing house KDPW_CCP positively influenced the position of the Polish capital market internationally and has been positively assessed by the rating agencies, in particular due to reduced counterparty risk. The result is an improvement in the perception of Polish capital market infrastructure by foreign and Polish financial institutions.

References

Baranowska-Skimina, A. (2012). *Jak EMIR zmieni rynek instrumentów pochodnych.* Retrieved from http://www.finanse.egospodarka.pl/88112, Jak-EMIR-zmieni-rynek-instrumentow-pochodnych,2,63,1.html

Główny Urząd Statystyczny. (2014). *Instrumenty finansowe przedsiębiorstw niefinansowych.* Retrieved from http://stat.gov.pl/obszary-tematyczne/podmioty-gospodarcze-wyniki-finansowe/przedsiebiorstwa-niefinansowe/instrumenty-finansowe-przedsiebiorstw-niefinansowych,20,3.html

Główny Urząd Statystyczny. (2015). *Instrumenty finansowe przedsiębiorstw niefinansowych w 2014 roku. Opracowanie sygnalne.* Retrieved from http://stat.gov.pl/obszary-tematyczne/podmioty-gospodarcze-wyniki-finansowe/przedsiebiorstwa-niefinansowe/instrumenty-finansowe-przedsiebiorstw-niefinansowych,20,3.html

Golawska-Witkowska, G., & Rzeczycka, A. (2009). *Instrumenty pochodne w ograniczaniu ryzyka bankowego.* Gdańsk: Politechnika Gdańska Wydział Zarządzania i Ekonomii.

Gorzelak, K., Barciszewska, A., Barciszewska, J., & Rogalski, T. (2011). *Towary giełdowe i towarowe instrumenty pochodne. Prawne aspekty obrotu*. Warszawa: Wydawnictwo C.H. Beck.

Jajuga, K. (2009). *Instrumenty pochodne,* Warszawa: Wydawnictwo KNF.

Kudła, J. (2009). *Instrumenty finansowe i ich zastosowania*. Warszawa: Wydawnictwo Key Text.

Repozytorium transakcji. (n.d.). Retrieved from http://www.kdpw.pl/pl/Repozytorium%20transakcji%20wersa%20EMIR/Strony/default.aspx

Regulation of the European Parliament and the Council of the European Union No. 648/2012 of 4 July 2012 on derivatives traded outside the regulated market, central counterparties and trade repositories. (2012, July 12). Official Journal of the European Union.

Sobolewski, P., & Tymoczko, D. (Eds.). (2011). *Rozwój systemu finansowego w Polsce w 2009 r.* Warszawa: Narodowy Bank Polski.

Stanek, R. (2012). *Regulacja EMIR – kolejna szczepionka antykryzysowa?* Retrieved from http://biznes.onet.pl/wiadomosci/ue/regulacja-emir-kolejna-szczepionka-antykryzysowa/phnx4g

Staszewska, P. (2014). Analiza porównawcza regulacji Dodd–Frank i EMIR oraz ich wpływ na pozagiełdowy rynek instrumentów pochodnych. *Bezpieczny Bank 3*(56).

Tarczyński, W., & Zwolankowski, M. (1999). *Inżynieria finansowa*. Warszawa: Agencja Wydawnicza Placet.

The Act of 24 October 2012 amending the Act on trading in financial instruments and certain other acts. (2012, December 26). Retrieved from http://isap.sejm.gov.pl/DetailsServlet?id=WDU20120001385

The Act of 23 April 1964 Civil Code. (2016, July 17). Retrieved from http://isap.sejm.gov.pl/DetailsServlet?id=WDU20160000380

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IMPACT OF EU FUNDS ON FINANCIAL AUTONOMY OF THE KRAKOW MUNICIPALITY IN THE YEARS 2007–2013

***Karolina Szczepaniak*[1]**

Abstract

Joining the European Union by Poland made it possible for municipalities to acquire resources from the EU funds in order to finance its current and capital expenditure. The objective of this article is to present the impact of the EU funds on financial autonomy of the Krakow municipality in the years 2007-2013. However, the impact of revenues from the EU funds on the municipality's financial economy is twofold. On one hand, the revenues from the EU funds improve its financial autonomy, by supplementing the shortage of own resources, on the other hand, to be granted subsidy from EU funds the municipality is required to provide its own contribution, thus increasing its debt. This article notes the need to strengthen the mechanism of self-governance and responsibility in the management of municipality's property in the face of tightening the principles concerning the level of permitted debt of municipalities and the need to assure continuous investment policy.

Keywords: *financial autonomy, EU funds, indebtedness of municipalities, Krakow capital expenditure.*

1. Introduction

Stripping of the communist system and political transformation in Poland began in 1989. The democratic changes were connected with the reconstruction of the local government structure where a municipality became its basic unit. Making it responsible for the execution of public service tasks required granting of legal and financial ability to exercise them. Financial autonomy was meant to enable the fulfillment of statutory goals and to make it possible for a municipality to assume the role of an investor to be oriented on the maximization of social, environmental and economic effects of current investments.

Acquisition of EU subsidies requires a substantial adjustment of the financial economy to the specific functioning of EU funds. It is an effect

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of additionality of the funds to the municipality's own contribution to the cost of an investment project. In order to acquire resources from EU funds, municipalities run into debt. A municipality's financial capacity is an essential matter in this context, as is the permitted debt ratio of a local government unit [LGU].

The Krakow municipality's financial autonomy analysis was carried out based on the revenue and expenditure autonomy ratios, assessed on the basis of income, revenue and expenditure of the Krakow municipality in the 2007-2013. The results identified that the resources acquired by the Krakow municipality from EU funds in the years 2007-2013 increased the municipality's investment opportunities. Nevertheless, it should be noted that the value of revenue from EU funds was reflected in the city's debt. In the light of the dual impact of the revenue from EU funds on the municipality's financial autonomy, the attitude of local authorities that manage the finances needs to be responsible and far-sighted.

2. Self-governance conception and financial autonomy of municipality

Self-governance refers to the state organization principle which assumes the existence of local governments supplied with a scope of autonomy and the consideration of legal grounds of their functioning and competencies in the basic law. The political changes after 1989 aimed at providing municipalities with instruments required for a self-governing policy – autonomous and equal in relation to higher level units.

Due to the comprehensiveness of required constitutional changes, they were conducted by three stages. In 1989, the Act on amending the Constitution of the Polish People's Republic [PRL] was passed, which guaranteed the participation of local governments in ruling (the Act of 1989). Subsequently, the core principles regarding the system and functioning of local governments were covered by the Constitutional Act, called the "Small Constitution" (the Act of 1992). On the basis of this document, the local government became the basic organizational form of the local public life, including the municipality as a basic local government unit. The Act assigned competencies to local government units to exercise their own tasks along those ordered by the government administration, where, in the case of the latter, it was emphasized that the state would have to provide the local governments with adequate financial resources. The "Small Constitution" also specified the revenue sources of local governments (the Act of 1992, Articles 70-73).

The Constitution of the Republic of Poland, passed in 1997, confirmed the determinations of the previous acts in reference to the local government, providing more details regarding certain provisions (the Act of 1997). The

supervision over the local government's organizational activity according to the Act, was given to the Prime Minister and the province governors, whereas its financial activity was subordinate to the regional chambers of the audit. The local government units were granted legal personality, i.e. the right of ownership and participation in transactions under civil law.

The indication of municipality as the basic local government unit meant the "obligation to maintain municipalities in the public administration system and the state territorial structure, but also the obligation to provide them with appropriate place, and thus to supply such a set of tasks and competencies, so that it could be stated that local self-governance is based on municipality" (Niewiadomski, 2011, Nb 9). Thus, the municipality has attributed the role of an entity shaping public life on the local level.

Self-governance is also a postulate towards the attitude of local authorities connected with the economy of activities. It is both a privilege to build the local Republic of Poland and the responsibility for what it is like and what it will be like.

Making the municipality competent to exercise its own and ordered tasks required the provision of sources of financing. In general, financial autonomy is the power expressed in the act to possess the financial resources sufficient for the performance of the tasks. This includes the obligation of the state to provide local governments with the resources sufficient for the performance of its tasks, among of which the unit's own revenue should prevail (Kornberger-Sokołowska, 2001, p. 39). The primary attribute of municipality's financial autonomy is the possession of the property and financial resources under autonomous budgets (Chojna-Duch, 2007, p. 178).

Municipality's financial autonomy also implies the possibility of forming the revenue and expenditure structure by the local government, which takes place under the revenue and expenditure self-governance.

According to Kornberger-Sokołowska, Zdankiewicz and Cieślak (2010, p. 39), the revenue self-governance is determined by the presence of the following elements:

- supply of own sources of revenue attributed for an indefinite period the concurrent assignment of a certain scope of sovereignty to the extent of this revenue creation,
- possession of property, which shall not only be the source of revenue, but it may also be used as a security of future credits,
- possession of legally guaranteed access to financial markets,
- possibility to act on the basis of an independently adopted annual budget.

Municipality's expenditure autonomy concerns the performance of its own tasks and financing them from self-created budgets, as well as decision-

making in determining the directions of capital expenditures and possible sources of financing them (Surówka, 2013). It is determined by the value of the municipality's income and revenue, shaped by its fiscal sovereignty and available instruments, such as taking loans.

In Surówka's opinion (2013, p. 26), municipality's expenditure autonomy comes down to:

- determining the priorities in the resource disbursement directions,
- forming the economic expenditure structure,
- managing the assumed property,
- shaping the budget balance,
- incurring municipal debt.

3. Additionality of EU resources as the principle of acquiring EU funds vs. municipality's financial capacity

The municipality runs its financial economy basing on the income and revenue, the level of which may be affected by it within the limits specified in the Act. Development needs of the territory require from the municipality to actively shape the local policy and incur the related capital outlays. Due to the fact that the own revenue of the municipality is inadequate to its spending needs, the option to co-finance the capital expenses from EU funds is attractive for municipalities. The use of EU funds is subject to the financial principles applicable in the case of the relationships between the Union and the member states, among which the most significant, from the perspective of engaging the local potential, is the additionality principle.

The additionality principle means that a project is co-financed from the EU funds only in the part, the value of which is determined by the project character. The EU resources should supplement the domestic activities. Acquiring the resources from EU funds requires the provision of the own so-called contribution. Its value depends on the project type, in particular, its capacity to generate profit. It means that public service tasks are granted more funds than commercial projects. For example, with reference to municipal investments, such as the construction of waste-water treatment plant, the minimum contribution of the municipality is approx. 15%.

In order to provide the resources required for the acquisition of EU funds, municipalities run into debts. The municipality's potential to incur debt is determined by its financial capacity and the permitted debt ratio specified in the Act.

In the opinion of E. Kornberger-Sokołowska (2007), the local government unit's financial capacity is determined, most importantly, by:

- relation to own revenue to total revenue, which also specifies the level of revenue self-governance of the local government unit,
- operating result being the difference between current revenue and current expenditure. The surplus makes it possible to incur liabilities without prejudice for the performance of current tasks. The deficit indicates the lack of capacity to cover current expenditure from current revenue and leads to the debt increase. It is of major importance when incurring liabilities and constructing the unit's budget,
- creditworthiness – it is evaluated by banks on the basis of methodology other than the one applied in the case of economic entities. The budget construction and revenue structure are subject to evaluation.

An important element when incurring liabilities by local governments is the way of calculating the permitted debt ratio. By the end of 2013, pursuant to the Act on Public Finance (2005, Articles 169-170), two local debt amount limits were effective. The first one was the 15% limit of the relation of the planned repayment of credits, loans and the redemption of bonds including interest and the discount in a given budget year to the budget revenue. The second was the 60% limit of the relation of the total debt amount to the budget revenue. At present, pursuant to the Act on Public Finance (2009, Article 243), the municipality's financial capacity is characterized by individual debt ratio (IDR), where the permitted debt level is determined by the shape of the relation between the debt servicing value and the resources which in the legislator's opinion can be appropriated to its repayment, i.e. most of all the operating surplus from the last three years. In addition, the unit's decision-making authority cannot adopt a budget in which current expenditure is higher than planned current income increased by operating surplus from the previous years and by free resources.

The purpose of amending the Act within the scope of the debt ratio is to limit the debt incurred by local governments, which implies the necessity to implement pro-saving policies by municipalities. It may affect the cuts of current expenditure and capital expenditure in the local policy. This solution also introduces impediments related to the acquisition of financial resources for the coverage of own contribution. In the years 2009–2010, the debt of local government units considerably increased. This is connected with liabilities intensively incurred for fear of losing the creditworthiness in the light of the new principles of calculating the debt ratio according to the value of operating surplus worked out for the last three years (Korolewska & Marchewka-Bartkowiak, 2011).

Particular budget items in Krakow in the years 2007–2013 are presented in Table 1.

Table 1. Krakow's budget in the years 2007–2013 on the basis of the amounts generated in ml PLN

Year	Total revenues		Total expenditures		Deficit / surplus	Total revenues	Total expenses
	Current revenue	Capital gains	Current expenditure	Capital expenses			
2007	2 540	270	2 270	739	-200	385	185
2008	2 725	266	2 532	623	-165	367	202
2009	2 873	288	2 713	706	-259	582	323
2010	3 070	315	2 804	560	20	331	316
2011	3 020	316	2 822	497	17	400	410
2012	3 092	354	3 032	456	-42	477	435
2013	3 381	354	3 175	465	96	307	337

Source: Own elaboration on the basis of the reports on the implementation of the Krakow budget in the years 2007–2013 retrieved from https://www.bip.krakow.pl, and the data from the Central Statistical Office [GUS] available at the website http://stat.gov.pl.

On the basis of the data regarding the budget of the Krakow municipality, it can be observed that:

- increasing level of current revenue and current expenditure and the imbalance between them,
- a greater increase of expenditure than revenue, resulting in a considerable operating deficit in the years 2007–2010. Expenditure showed an upward trend every year, except for 2010, when a decline was noted as compared to the previous year (2%),
- the budget deficit occurred in 4 years of the researched period: in 2007–2009, 2012 and 2014. In the years 2007–2009, it reached the highest values, with the maximal of 259 million PLN in 2009. It is connected with the drop in the municipality's own revenue, occasioned by the economic crisis, the increase in the number of own tasks (among others, the Act dated 2010 on support for the development of telecommunication services and networks, 2015, the Act dated 2011 on family support and foster care system, 2015), and amending the regulations on permitted debt of municipalities. Since 2010, the city has noted a budget surplus. In 2011, it implemented measures to reduce the city's debt level, approaching 60% of the total revenue (the debt limit effective by the end of 2013). The City Council made the decision that "any other 'savings' resulting from the tender settlements within the framework of the performance of investment tasks would be dedicated exclusively to repayment of the city's credit obligations up to the amount of 20 million PLN, and subsequently to increasing of current expenditure in the field of education" (the Resolution of the Krakow City Council in the matter of the Krakow City budget for year 2011, 2011, paragraph

16). The deficit is calculated on the basis of the amounts planned in the budget, what encourages to overvalue the planned revenue by municipalities (Surówka, 2013),

- revenues of Krakow's budget increased during the almost entire researched period in connection with credits taken by the city, the repayment of granted loans, the existence of free resources as a surplus in bank account, the property sell-off and the issue of bonds, which took place in the years 2009 and 2011–2012 in the amount of 300 million PLN, and in 2013 in the amount of 220 million PLN.

Krakow's financial economy raises reservations related to the city debt. The reduction of the deficit in the years 2010–2013 is connected with the necessity to reduce the risk of losing the financial capacity, before the enforcement of the new principles of calculating the debt ratio.

4. Impact of EU funds on financial autonomy of the Krakow municipality in the years 2007–2013

The period 2007–2013 covers the economic cycle of the country, i.e. the relative revitalization of the first three years, the depression of 2010 and the re-revitalization in the years 2011–2013. Substantial variability of macroeconomic factors affected the level of local revenue and expenditure, determining the financial autonomy of municipalities.

The years 2007–2013 also comprise the investment cycle connected with the financial perspective of the European Union and the allocation of foreign resources. In the researched period, the Krakow municipality intensively acquired resources from structural funds and the Cohesion Fund. It signed co-financing agreements worth 1,630 million PLN. Co-financing of projects from EU funds was set at the level of 766 million PLN, which constituted 47% of the total value of projects. Financial autonomy may be examined based on the municipality's revenue and expenditure autonomy ratios. Their adjustment by the revenues from EU funds will show how much these resources affect the municipality's autonomy in the realization of revenues and expenditures.

The Krakow municipality's revenue autonomy, in the context of the creation of own revenues, is reflected by the SD ratio. The level of revenues from EU funds depends on the local authority's engagement in the acquisition thereof. Therefore, they constitute own revenues of the municipality and hence they are included in the SD ratio's numerator (Formula 1, 2, 3, and 4).

$$SD = \frac{DW + PUE}{DB} \cdot 100 \qquad (1)$$

Where:
SD – revenue autonomy
DW – own revenues
DB – total budget income, including revenues from EU
PUE – revenues from EU funds

After deducting the revenues from the EU funds, it constitutes SDK.

$$SD_K = \frac{DW}{DB \updownarrow PUE} \bullet 100 \qquad (2)$$

Where:
SD_K – revenue autonomy corrected by revenues from EU funds
DW – own revenues
DB – total budget income, including revenues from EU
PUE – revenues from EU funds

The revenue autonomy ratio SD informs about the municipality's autonomy in the creation of its own revenue (Table 2). The higher it is, the more autonomous the unit is from the revenue transferred from the state budget. The impact of the municipality on the creation of its own revenue comes down to a widely-defined development policy of the city, consisting in the creation a place that is conducive to entrepreneurship, business and attractive for the inhabitants. An active social policy, which reduces unemployment, is also important.

Table 2. Revenue autonomy ratios in the years 2007–2013

Description	2007	2008	2009	2010	2011	2012	2013
Total own revenue [ml]	1 991	2 149	2 203	2 143	2 284	2 370	2 617
Total revenue [ml]	2.809	2.991	3.161	3.385	3.336	3.446	3.736
Revenues from EU funds [ml]	46.92	28.13	70.95	113.59	13.24	3.43	60.55
Autonomy ratio SD [%]	72.55	72.79	71.95	66.67	68.85	68.88	71.68
Revenue autonomy ratio SDK [%]	72.08	72.54	71.30	65.51	68.73	68.85	71.21
Decline/increase of revenue autonomy SDK – SD [%]	-0.47	-0.26	-0.64	-1.16	-0.12	-0.03	-0.47

Source: Own elaboration on the basis of the reports on the implementation of the Krakow budget in the years 2007–2013 available at the website https://www.bip.krakow.pl, and the data from the Central Statistical Office [GUS] available at the website http://stat.gov.pl.

Revenue autonomy, expressed by SD ratio, dropped in the researched period (Figure 1). SD ratio is subject to considerable fluctuations, but it shows a downward trend. The lowest value was reached in 2010, at 66.67%. The municipality's revenue autonomy, corrected by revenues from EU funds, was even lower. The difference between the ratios was the biggest in the years 2007–2010, and in 2013.

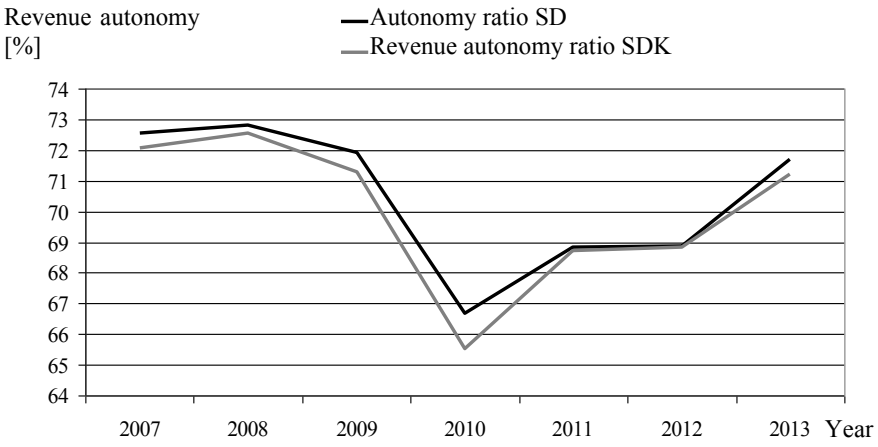

Figure 1. Revenue autonomy of the Krakow municipality in the years 2007–2013

Source: Own elaboration on the basis of the reports on the implementation of the Krakow budget in the years 2007–2013 available at the website https://www.bip.krakow.pl, and the data from the Central Statistical Office [GUS] available at the website http://stat.gov.pl.

The level of revenue autonomy dropped by 5.8% in the years 2007–2010 and increased by 5.1% in the years 2011–2013. The drop was affected by the revenues from CIT and PIT taxes, which were reduced as a result of the economic crisis, and the receipts from the tax on civil law transactions, which strongly depends on the number of transactions in the real property market. The increase of revenue autonomy in the years 2011–2013 was connected with the city's rising from the economic recession and the related rise in the property tax rate in Krakow. The rate was raised, despite the objections of councilors, from one of the lowest level in Poland at 0.56 PLN in 2010 (Rąpalski, 2010) to 0.62 PLN in 2011. At present, it amounts to 0.75 PLN (the Resolution of the Krakow City Council in the matter of the determination of property tax rates, 2015).

The value of revenues from EU funds in the municipality's budget is determined by its financial standing and the policy of its authorities. The

level of these resources is observed to evolve on a regular basis. Their level at the beginning and the end of the researched period is similar (on average 53 million). They reach the maximum value in 2010 (113.59 million) and go down in 2012 (3.43 million). The 2010 peak was related to the acquisition of subsidy in the amount of nearly 45 million PLN, in connection with the implementation of the project Wastewater Treatment Plant Płaszów II, stage II. This amount constituted almost 40% of receipts from EU funds in 2010. It should be noted that in the period preceding the acquisition of high revenues from EU funds, the Krakow budget noted a record-breaking deficit for the researched years 2007–2013 at the level of 259 million PLN in 2009. To a large degree, it was related to the coverage of the capital expenses settled in the following year.

The drop in revenues from EU funds in the years 2011 and 2012 was related to the economic crisis. The total city revenue dropped in 2011 by 1.42% as compared to the previous year, which constituted more than 48 million PLN and lowered the Krakow municipality's investment opportunities, which determined the refund of expenditures in the following years.

Deducting the revenues from EU funds additionally, reduces the revenue autonomy of the municipality. The biggest drop of SDK ratio was in 2010 – 1.16%, which was the effect of the high level of subsidies from EU funds and of the drop of own revenues of the municipality.

The municipality's expenditure autonomy can be analyzed basing on expenditure autonomy ratio SW, which informs about the contribution of the municipality's capital expenditures in possible sources of financing them.

$$SW = \frac{\mathrm{WI}}{\mathrm{PO} + \mathrm{DB}} \cdot 100 \qquad (3)$$

Where:
SW – expenditure autonomy
WI – capital expenditure
PO – total revenue
DB – total budget income, including revenues from EU

After deducting the revenues from the EU funds it constitutes SW_K. The difference $SW_K - SW_1$ shall determine the scale and direction of the change of municipality's expenditure autonomy.

$$SW_K = \frac{\mathrm{WI} - \mathrm{PUE}}{\mathrm{PO} + \mathrm{DB} - \mathrm{PUE}} \cdot 100 \qquad (4)$$

Where:
SW_K – expenditure autonomy corrected by revenues from EU funds
WI – capital expenditure
PO – total revenue
DB – total budget income, including revenues from EU
PUE – revenues from EU funds

Expenditure autonomy ratio SW (Table 3) specifies the scope in which the unit decides about the directions of expenditures and land development priorities. Its decline indicates limited investment opportunities of the municipality and an increased importance of current expenditure. In the researched period, the municipality's capital expenditure considerably declined. This is related to the conception of the lack of self-financing of municipalities, i.e. the inadequacy of own revenues to current expenditure, which in consequence are realized at the cost of capital expenditure.

Table 3. Expenditure autonomy ratios in the years 2007 -2013

Description	2007	2008	2009	2010	2011	2012	2013
Capital asset-related expenditure [ml]	739	623	697	560	483	440	401
Total revenue [ml]	385	367	582	331	400	477	307
Total income [ml]	2.809	2.991	3.161	3.385	3.336	3.446	3.736
Revenues from EU funds [ml]	46.92	28.13	70.95	113.59	13.24	3.43	60.55
Expenditure autonomy ratio SW [%]	23.14	18.56	18.63	15.08	12.92	11.22	9.92
Expenditure autonomy ratio SWK corrected by revenues from EU funds [%]	21.99	17.87	17.06	12.40	12.61	11.15	8.56
Drop/growth of expenditure autonomy SWK – SW1 [%]	-1.15	-0.69	-1.57	-2.68	-0.31	-0.08	-1.37

Source: Own elaboration on the basis of the reports on the implementation of the Krakow budget in the years 2007–2013 available at the website https://www.bip.krakow.pl, and the data from the Central Statistical Office [GUS] available at the website http://stat.gov.pl.

Expenditure autonomy, expressed by expenditure autonomy ratio SW, declined by more than a half, dropping by 13.21% (Figure 2). After deduction of the revenues from EU funds, the drop is even more noticeable – a decline of SWK by 13.44%. The lack of revenues from EU funds among the possible sources of financing reduces the municipality's expenditure autonomy on average by 1.12%. The biggest limitation of expenditure autonomy took place in 2010 and amounts to 2.68%.

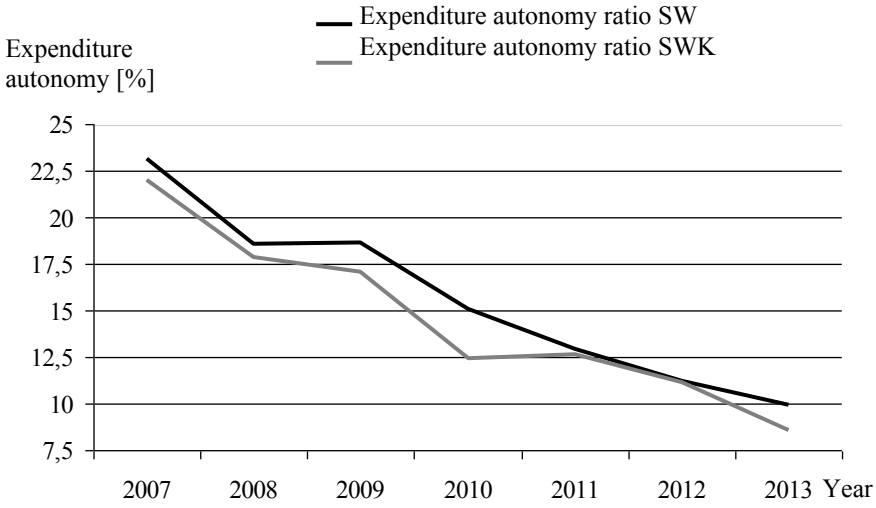

Figure 2. Expenditure autonomy of the Krakow municipality in the years 2007–2013

Source: Own elaboration on the basis of the reports on the implementation of the Krakow budget in the years 2007–2013 available at the website https://www.bip.krakow.pl, and the data from the Central Statistical Office [GUS] available at the website http://stat.gov.pl.

At first, the impact of the receipts from EU funds on expenditure were small (2008). In 2009, the discrepancy between the edge lines of SW and SWK ratios increased and was maintained until 2010, when the municipality obtained the highest revenues from EU funds. The ratio trend lined part again in 2013. The specificity of the investment cycle based on the revenues from EU funds usually requires incurring prior capital expenditure facilitating the acquisition of a subsidy. One may notice the relation between the level of total revenue and the level of revenues from EU funds: the increased level of total revenue precedes high amounts of subsidies from EU funds. The expansive investment policy of Krakow and the progressing debt in the years 2007–2009 determined the provision of a high level of revenues from EU funds in 2010. Since 2011, in connection with the influence of legal and macroeconomic factors on the financial policy of the city, the amount of debt incurred was limited. It was balanced by the issue of bonds, which covered the deficit. The capital expenditure in the years 2011–2012 was also financed by these revenues. Since they were settled, the level of subsidies from EU funds grows in 2013, what was significant in the context of upcoming settlement of contracted subsidies. The capital asset-related expenditure amounted to 669 million in 2014.

5. Conclusions

The debt of local government units is a part of the national public debt. Since joining the European Union by Poland, one can observe a progressing growth of liabilities incurred by local government units on account of loans and credits. This results from the fact of the lack of self-financing and realization of current and investment tasks basing on repayable financial resources. It is also an effect of capital expansion related to the possibility to co-finance the expenditure from EU funds. A large part of the local expenses is realized subject to EU subsidies, sometimes leading to a "forcing out of other expenses of local governments" (Kopańska, 2014, p. 106).

The revenues from EU funds are an additional tool of the development policy of local government units. Their contribution to the financing of municipal expenses has become, over time, a prestigious factor of local management. The investments co-financed from the European resources are marked by information boards which indicate the source of financing and operating program under which the project was completed. This makes it possible for the inhabitants to evaluate the effects of efforts and to shape a positive image of the Community and local authorities. The prestige of taking advantage of the co-financing from European resources is also connected with the occurrence of rankings identifying the engagement of municipalities in the acquisition of funds with the effectiveness of overall operation of local government units. These rankings often skip the matters of disbursement, the settlement of funds, their absorption, running into debts and also the financial autonomy of municipalities.

Currently, municipalities may take advantage of EU funds under the financial perspective 2014–2020, which is the last period of support from EU funds for the Polish municipalities on such a high level. Therefore, it is important to see the necessity to conduct autonomous financial policies after the year 2020. It becomes a priority to popularize the mechanism of self-governance and responsibility in city property management, also due to the necessity to maintain completed projects in the future.

The lack of revenues from EU funds in the future will have to be compensated by the tools available for the municipality: fiscal sovereignty, development of other self-generated revenues and revenue structure management.

References

Chojna-Duch, E. (2007). *Polskie prawo finansowe. Finanse publiczne*. Warsaw: LexisNexis.

Kopańska, A. (2014). *Efektywność decentralizacji. Analiza zdecentralizowanego dostarczania dóbr o charakterze ponadlokalnym*. Warsaw: Difin.
Kornberger-Sokołowska, E. (2001). *Decentralizacja finansów publicznych a financial autonomy jednostek samorządu terytorialnego*. Warsaw: Liber.
Kornberger-Sokołowska, E. (2007). Problemy pozyskiwania środków unijnych przez polskie jednostki samorządowe. *Official Journal of the European Union*, *5*, 61-67.
Kornberger-Sokołowska, E., Zdankiewicz, J., & Cieślak, R. (2010). *Jednostki samorządu terytorialnego jako beneficjenci środków europejskich*. Warsaw: Wolters Kluwer Polska.
Korolewska, M., Marchewka-Bartkowiak, K. (2011). Zadłużenie samorządów terytorialnych w Polsce. Retrieved from http://orka.sejm.gov.pl/WydBAS.nsf/0/EEBC3246D6FDAFC8C125795A004B9FE4/$file/Studia_BAS_28.pdf
Niewiadomski, Z. (2011). Comments to Article 1 of the Act on Local Government. In: R. Hauser and Z. Niewiadomski (Eds.), *Ustawa o samorządzie gminnym. Komentarz z odniesieniami do ustaw o samorządzie powiatowym i samorządzie województwa*. Retrieved from http://cyfroteka.pl/ebooki/Ustawa_o_samorzadzie_gminnym__Komentarz_z_odniesieniami_do_ustaw_o_samorzadzie_powiatowym_i_samorzadzie_wojewodztwa-ebook/p0205575i020
Rąpalski, P. (2010). *Prezydent Krakowa chce podwyższyć podatek od nieruchomości*. Retrieved from http://krakow.naszemiasto.pl/artykul/prezydent-krakowa-chce-podwyzszyc-podatek-od-nieruchomosci,602968,art,t,id,tm.html
Surówka, K. (2013). *Autonomia finansowa samorządu terytorialnego w Polsce*. Warsaw: Polskie Wydawnictwo Ekonomiczne.

Other sources

The Act of December 29th, 1989 on amending the Constitution of the Polish People's Republic, the Journal of Laws 1989, No. 75, item 444, as amended.
The Constitutional Act of October 17th, 1992 on mutual relationships between legislation and executive authority of the Republic of Poland and on local government, the Journal of Laws 1992, No. 84, item 426.
The Constitution of the Republic of Poland of April 2nd, 1997, passed by the National Assembly on April 2nd, 1997, adopted by the Nation in the constitutional referendum on May 25th, 1997, signed by the President of the Republic of Poland on July 16th, 1997, the Journal of Laws 1997, No. 78, item 483 as amended.
The Act of June 30th, 2005 on public finances, the Journal of Laws 2005, No. 249, item 2104 as amended.

The Act of August 27th, 2009 on public finances, the Journal of Laws 2013, item 885 as amended.
The Act of May 7th, 2010 on support for the development of telecommunication services and networks, consolidated text: the Journal of Laws 2015, item 880.
The Act of June 9th, 2011 on family support and foster care system, consolidated text: the Journal of Laws 2015, item 332.
Resolution of the Krakow City Council dated February 16th, 2011 on the Krakow City budget for year 2011, NO VIII/62/11.
Resolution of the Krakow City Council dated November 18th, 2015 in the matter of the determination of property tax rates, NO XXX/487/15.
The Map of the European Union's subsidies, presenting the information on all projects being implemented in Poland which are co-financed from the European Funds according to the data as at the end of March 2016:
http://www.mapadotacji.gov.pl/projektywojewodztwo=6&powiat=134&fundusz=&program=&dzialanie=&beneficjent=Krak%C3%B3w&tytul=&lata=2007.

Biographical note

Karolina Szczepaniak – Ph.D. student at the Cracow University of Economics, graduated from Spatial Economy at Cracow University of Economics (2015) and Russian Studies at the Jagiellonian University (2009). In 2015 defended her master's thesis in the field of financial management of the city of Krakow in the light of the use of EU funds. Awarded second prize in the competition for the best master's thesis in the field of Entrepreneurship, Innovation and Regional Development organized by the Foundation Sapere Auso and MARR. Her research interests include spatial aspects of city management, local finances and the socio – economic consequences of the 90s political transformation in Poland.