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Patrycja Klimas
Aneta Lipińska

Emerging Challenges in Modern Management

WYDAWNICTWO SPOŁECZNEJ AKADEMII NAUK

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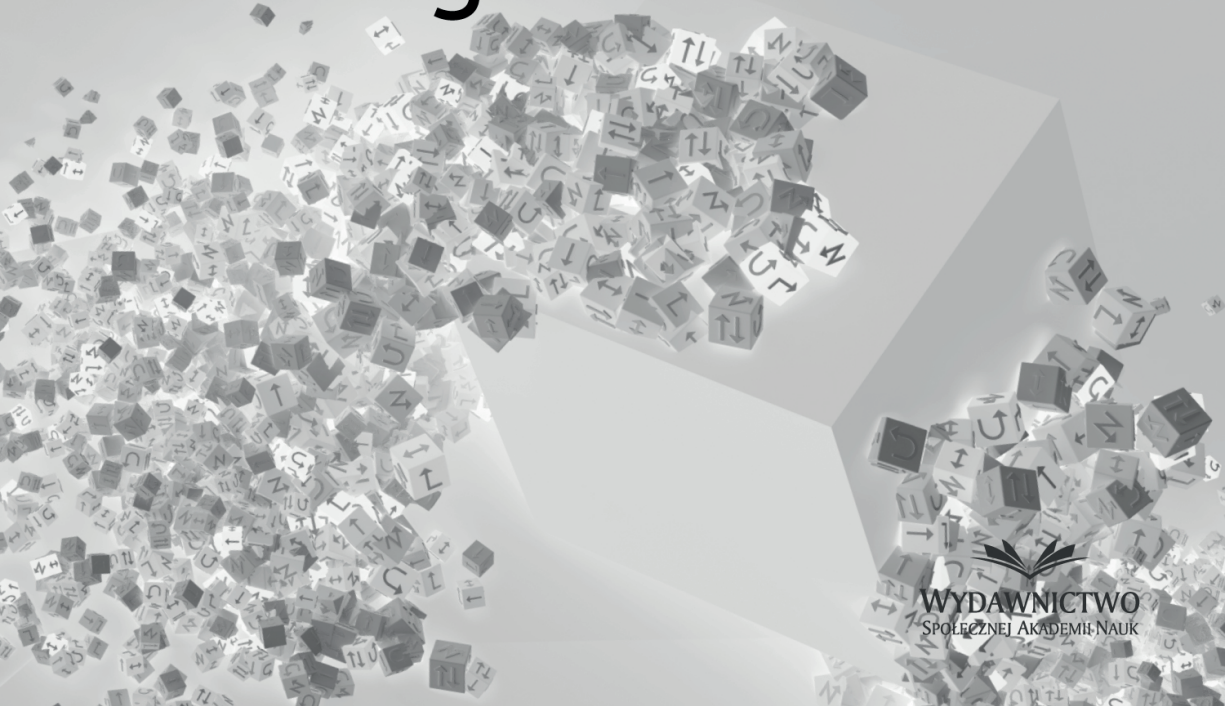

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Preface

This Issue of Entrepreneurship and Management offers twenty-two academic papers facing the most current hence still under-researched problems considered in the latest works placed within the Management Sciences.

The included papers focus on the Emerging Challenges in Modern Managements exploring them through the most up-date and currently pressing managerial problems faced in both management theory and practice. To outline the general scope of the papers we decided to use a "world-cloud" technique which takes into account the frequency of words used in a particular text. Here, a "word-cloud" has been created using words used by Authors in the titles and abstracts of their papers to show the main lines of their considerations – see the figure below.

Figure 1. The thematic scope of the Issue

Source: based on titles and abstracts taken from articles from this Issue, prepared using https://tagcrowd.com.

As expressed by the size of the words in the above word-cloud, the papers included in this Issue focus on organization, whereas they consider in details a wide range of organizational aspects from the perspective of such managerial problems as management, innovation, business models, sustainability, and value creation. Those aspects are the anchors, the key points, the crucial topics identified, recognized and revealed within the articles. Nonetheless, in order to make you more familiar with as well as more interested in the included articles it is reasoned to announce them using three critical perspectives, namely the theoretical background, the methodological design, and the industry focus adopted.

First, the considered managerial **concepts, theories, perspectives and standpoints** applied as the theoretical lenses for both theoretical and empirical investigations. In general, the vast majority of papers included in this Issue refers to strategic management, however, five specific areas of consideration may be distinguished, namely:

- relational view on competitive advantage discussed through Resource-Based View (RBV) and justified by the evidence for profitability of synergistic combination of value creation and co-creation, exploitation of open, co-operative and network approach to innovations;
- business modeling shown form the perspective of structural/architectural (e.g. business model canvas) and conceptual/dominance logic (e.g. view on pre-dominant goal of organization) approach applicable either in more traditional or more creative industries;
- entrepreneurship considered not only at organizational level, but also at industry and regional ones in the context of creation, maintenance and increasement of opportunities for longitudinal survival and development;
- sustainability seen as a broad concept useful in the context of improving enterprise management (including quality management and human resource management) or implementing corporate social responsibility approach;
- current strategic issues regarding the newest practices in the field of risk management, project management, development of suitable organizational culture, creation of turquoise organization, building a business excellence, and knowledge management (including managerial focus paid on organizational consciousness and imagination, information overabundance, opportunity recognition and exploitation, or knowledge transfer).

Second, the **methodological approaches** applied by Authors in order to handle the current managerial issues and unresolved tensions. Given the methodological perspectives, this Issue offers both theoretical and empirical papers developed using a wide range of research methods. On the one hand, the Authors present the results of theorizing and conceptualizations based on own, original theoretical considerations, or insights drawn from critical literature reviews or analyses of examples from business practice. On the other hand, the set of articles included in this Issue provides some empirical findings based on original field studies carried out using both qualitative and quantitative approaches. Among the research methods applied, there are those following qualitative techniques such as non-participatory observation, structured and categorized interviews, as well as those following quantitative techniques including descriptives and statistical analyses aimed at identification of interdependencies, directional, and dependence relationships between and among management-related variables.

Third, an **industry focus** adopted in Authors' explorations and explanations used to give a practical and business context. From more utilitarian perspective this Issue bridges managerial aspects significant in both digital (e.g. value creation, co-creation, exploitation, and appropriation in e-commerce) and non-digital sectors (e.g. quality assessment in higher education, business model canvas suitable for jewelers). Furthermore, it provides both conceptual and empirical considerations presented in the articles referring to both traditional industries pushed by technology, innovation or knowledge (e.g. graphene commercialization, effectiveness of agricultural machinery manufacturers) and those driven by creativity, ingenuity or insightfulness such as creative and cultural industries (e.g. structural view on business models suitable for fashion designers, advertisement agencies, film producers). Last but not least, this Issue provides new insights into management of large organizations representing private and public sector as well as small and medium enterprises seen as *spiritus movens* of economic development at global, regional, and national level.

To conclude, we believe that the set of papers included in this Issue will grasp your attention as they tackle emerging challenges in such managerial areas as strategic management, innovation and knowledge management, human resource management, and entrepreneurship.

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Value Network Creation and Value Appropriation in E-commerce[1]

Abstract: The purpose of this paper is to examine the model of creating and appropriating value (VCA – value creation-appropriation) in the context of e-commerce value network. Specifically, this paper tries to answer the following questions: What is the relation between creation and appropriation of value? (1) What are the mechanisms of creation and appropriation of value? (2) What are the specifics of e-commerce and the value of e-commerce? (3) How can value creating and appropriating networks be modelled and analyzed in the context of e-commerce? (4) The paper is theoretical and provides an analytical review of strategic management, marketing, logistics and economic literature concerning value in order to clarify the VCA models and discuss VCA in the context of e-commerce value network. On the basis of this analysis a network governance concept is proposed.

The paper provides a discussion on determinants of value creation and appropriation mechanisms in the e-commerce context. It concludes that the e-tailer's share in value distribution depends on its position in the network determined by possessing tacit and complex information, rare and valuable competences and social ties with customers.

Key words: value chain, value network, value creation, value appropriation, e-commerce

1 The paper was written with financial support from the National Center of Science (Narodowe Centrum Nauki) – the grant no. DEC-2015/19/B/HS4/02287.

Introduction

Nowadays, competitive advantage is determined by offering value to the customer understood as a group of activities leading to shaping the cost-benefit ratio in a way attractive for the market. Strategies aimed at creating and delivering the value have led companies to create it together for the final customer and to change business models, which are characterized by cooperation with external specialized partners, co-creating value chains or networks. The joint efforts of companies and buyers can create the desired value [Henneberg, Mouzas 2015].

In addition to inter-organisational cooperation, the development of new information and communication technologies has enabled direct participation of customers in the value creation and expansion of the value network to include end users. Prosumerism is particularly pronounced in companies with business models using information technologies. A typical example is e-commerce, which uses extensive value networks. It is assumed that the specificity of e-commerce activity consisting, among other things, in the possibility of continuous contact between the parties of a transaction creates perfect conditions for co-creating values [Zwass 2010].

The problem of co-creation of values has been the subject of research for many years. The concept of a value network, based on the principle of co-creation, covers all value-creating entities, including customers, producers as well as widely understood suppliers [Vargo, Maglio, Akaka 2008]. However, the co-creation of values generates a new problem, namely appropriating values [Czakon 2009; Mizik, Jacobson 2003]. The meaning of competitiveness is the ability not only to create but also to capture higher value in the value network.

In the case of e-commerce, neither research aimed at studying creation processes nor studies into value appropriation seem to be sufficiently developed. In terms of entities in e-commerce, the value network consists of: customers, e-tailers and their suppliers. The client can be almost any individual or institutional person who has access to the Internet and financial resources. E-tailers are mostly companies that have their own online shops or cooperate with other intermediaries such as marketplaces, auction platforms. On the other hand, suppliers are widely understood here and include both suppliers of products (goods and services) sold via the electronic channel, but also other entities offering complementary services and supporting e-commerce, e.g. providers of logistic services, financial services, IT solutions, comparison shopping websites. Each member of the network co-creates and at the same time captures value. Examining the mechanisms and processes that determine income distribution within e-commerce networks is an urgent and still unresolved research problem. The key explanations hinge on the basic economic theory of rent. "Winning" depends not only on rent generation but also on rent appropriation.

The aim of the paper is to examine the model of creating and appropriating value in the context of e-commerce value network, especially to identify the determinates of e-commerce-specific values, as well as the co-creators and beneficiaries of values understood in the economic sense. The article is conceptual. The conclusions from the analysis should help in empirical identification of the dominant value models in e-commerce.

The study consists of four parts. The first one will explain the essence of the value-creation process. The next one will outline the problem of value appropriation on the basis of the classic theory of economic rent. The third part will present the essence of e-commerce and the elements of value for the customer in e-commerce. Next, we will discuss the conceptual model of the value network in the context of e-commerce, together with an analysis of the potential models of network governance determining the mechanism of value appropriation.

Value and value creation

The purpose of business strategy is to develop a competitive business system in selected markets leading to economic value creation. Value is a core concept in strategic management however its theoretic roots lie in economics. The methodical approach to the value commenced in the writings of A. Smith, D. Ricardo and other representatives of the classic school who explained the worth and price. Economists introduced customer utility into value definition and value creation parameters, such as capital inputs, technologies, labour costs, esteem value and relative shortages. The classic theory of economic rent, extended by neoclassical models of imperfect competition and the structure-conduct -performance paradigm – all of them inspire modern theories on value.

In business strategy context value can be viewed as either a specific idea or a sum of numerous inputs materialized in the final product[2]. Value is usually considering within a vertical chain extending from suppliers of resources to firms, through firms, to buyers of products and service from firms [Porter 1985]. Value is generated by all participants of chain as a whole. This concept is essentially an extension of value chain concept to inter-firm relationships. Since firms do not usually carry out the primary activities themselves, it is useful to analyse a wider system of creating value, which is known as a value system [Frynas, Mellahi 2011] or value network [Parolini 1999]. Instead of performing activities sequentially (Porter's value chain) activities are now performed simultaneously

[2] Other scholars have defined value in terms of shareholder returns. However, shareholders are unlikely to capture all of the value created within firm [Coff 1999]. This approach neglects the returns captured by customers, employees, suppliers and other stakeholders, thus it does not seem to be relevant to discussion on value creation and appropriation.

and value is created together instead of each actor creating value one after another. In value network actors interface with each other and perform the 'right' activities for them (which they can perform fastest, cheapest, etc.) creating value to all parties. According Parolini [1999, p. 59], "rather than being considered simply as sets of economic players, value-creating systems should be seen as sets of activities that are jointly involved in the creation of value".

The identification of the sources of value creation has been one of the main issues in strategic management. Inter-organizational value creation is the domain of well-established management theories including externally-focused theories based on industrial organization economics [Porter 1980] as well as the internally-focused resource-based view of the firm [Barney 1991]. From both perspectives, firms compete or cooperate with competitors, suppliers, customers and other stakeholders to create value either by occupying a superior position in markets or by possessing firm-specific resources (core competences) that are difficult to imitate. Inter-organizational value creation is also a central concern of research focused on joint ventures, strategic alliances, buyer-supplier relations and inter-organizational networks.

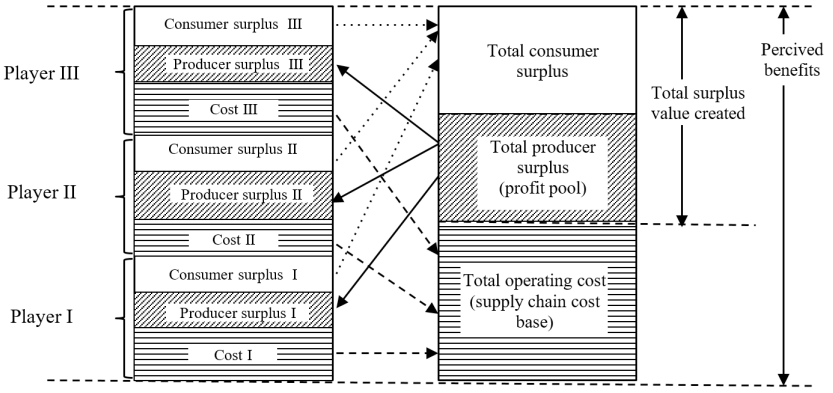
Value appropriation

Value creation and value appropriation are two very important issues discussed in the literature on strategy. The first one handles the question how economic participants define and create value, while the second one refers to the question how they allocate once created value. Most of the previous research has focused on either value creation or value appropriation. According to many scholars, value creation is more important and more difficult to manage [Moran, Ghoshal 1999]. Creation value and the identification sources of value were the main theme of RBV approach [Peteraf, Barney 2003]. In turn, Coff [1999] argued that value creation is not sufficient for a firm to gain superior performance and proposed the bargaining perspective. A firm can achieve superior performance when it can capture the value created through the sources [Pisano, Teece 2007]. In this approach, value appropriation is the more relevant process than value creation since only appropriation impacts firm profitability. In contrast, according to Bowman and Ambrosini [2000] firms must achieve some sort of healthy balance between value creation and value appropriation. Indeed, value creation and value appropriation are two distinct but interrelated processes. Integrated understanding of these dual process in the value chains and international business context has become increasingly important with the growth of multinational enterprise and of international trade and competition.

Value appropriation within a value system is bounded by the total value created by the economic participants, which is in turn equal to the final utility enjoyed by the final consumer (fig. 1). From the perspective of an individual player the captured value is of central importance in determining its performance. A firm adds value to bought-in materials and services through its own production and marketing efforts within the firm. This value equals a difference between cost of inputs and the price a firm receives for providing resource.

A fundamental distinction must be made between a player's value created and a player's value appropriated (captured value). In the strategy context, captured value of a firm can be defined as the value created by all the players in the value system minus the value created by all the players expect this firm. This definition is consistent in spirit with definition of value added provided by Brandenburger and Stuart [1996].

Figure 1. Value creation with many players



Source: adapted from [Światowiec-Szczepańska 2016].

Value creation-appropriation is usually considered as a game consisting of two phases. Value creation takes place in the first stage and then, it is appropriated in a second one [Coff 1999]. As such, value creation – appropriation (VCA) is usually presented as a zero-sum game, in which the bargaining between players determines prices and the division of total value created [Garcia-Castro, Aguilera 2015].

Value distribution is dependent on the negotiations between the various players of value system. Thus, every way to enhanced bargaining power may be used in contention for a share in captured value. They include market-based bargaining power, isolating mechanism and opportunity-based action. Dynamically, VCA does not need to be a zero-sum game [Garcia-Castro, Aguilera 2015] and allows to consider other mechanism of appropriating value based on relational norms.

The appropriated value is a result of the firms bargaining power exploited to establish appropriation streams. Mechanism of value appropriating is determined by type of value chain governance. The classification describes five basic types of value chain governance [Gereffi, Humphrey, Sturgeon 2005]. They are:

1. Markets – the important issue is that the cost of changing the partner is low for both entities.
2. Modular value chains – suppliers in modular value chains produce items according to a customer's specifications with some transaction-specific investments.
3. Relational value chains – complex interactions between buyers and sellers, which often create common reliance and high level of assets' particularity; the importance of trust and reputation.
4. Captive value chains – small suppliers are dependent on much larger buyers; suppliers confront high changing costs and high level of control by leading company.
5. Hierarchy – vertical integration with managerial control executed either by managers towards subordinates, or by headquarters towards subsidiaries.

It should be noted that any value chain encompasses thousands different individual transactions and many inter-firm relations so it contains multiple governance forms. Giving the complexity processes in value chain it can often be misleading to identify a prevalent governance mode of the linkages having by a given company or within a given global value chain. The main governance pattern is associated with combinations of three factors: the complexity of information exchanged between value network tasks; the codifiability of that information, and the capabilities resident in the value net (tab. 1).

Table 1. Determinants of value chain governance

Governance type	Complexity of transaction	Ability of codify transactions	Capabilities in the supply-base	Degree of explicit coordination and power asymmetry
Markets	Low	High	High	Low
Modular	High	High	High	↕
Relational	High	Low	High	
Captive	High	High	Low	
Hierarchy	High	Low	Low	High

Note: There are eight possible combinations of the three variables. Five of them generate global value chain types. The combination of low complexity of transactions and low ability to codify is unlikely to occur. This excludes two combinations. Further, if the complexity of the transaction is low and the ability to codify is high, then low supplier capability would lead to exclusion from the value chain. While this is an important outcome, it does not generate a governance type *per se*.

Source: [Gereffi, Humphrey, Sturgeon 2005].

E-commerce and value in e-commerce

In e-commerce, goods or services are ordered online, while payment for them and their delivery can be made in any form. Thanks to the Internet, customers have access to products that they can buy under better conditions. They may also purchase new products, which they did not use previously due to their unavailability in the form of location in distant places [e.g. goods from abroad], lack of time or a different lifestyle.

The Internet has become an important medium and tool in creating value. It changed the range of benefits and costs and their importance for the customer. Thanks to the Internet, customers can access information about companies and thus their products at any time. They can easily find offers, compare them and read opinions of other users.

In e-commerce, as opposed to its traditional counterpart, transactions are carried out at a distance. This implies specific benefits, but also costs for the network participants [Kawa 2017]. From the customer's perspective, a lower price and convenience are associated with the lack of immediate access to the goods, a limited possibility to try out the product before purchasing it and the risk of receiving a product that does not meet expectations or even a lack thereof. They therefore agree to certain non-financial costs. From the perspective of the e-tailer, quick and relatively cheap access to a wide range of customers is related to great competition or a risk of the customer not accepting or returning the goods. On the other hand, suppliers obtain a new distribution channel for their products, but they usually have to be satisfied with a lower margin. Each of these actors assesses the usefulness of their actions and thus seeks value appropriate for them. Therefore, a value network is created, in which apart from the particular interests of the individual network members, the customer's preferences and expectations are taken into account, as well as his or her willingness to incur costs in return for the benefits obtained.

E-tailers, like the traditional ones, can influence customer value by increasing the benefits offered or by reducing the financial and non-financial costs. Despite the price criterion indicated as a key one in e-commerce, there are many examples where the seller maintains the same level of value for the customer, increasing the price, but at the same time reducing the customer's non-financial costs. For the customer, it may be more important to have a wide range of products, faster delivery (e.g. on the same day), greater credibility of the seller (e.g. a large number of positive opinions of the existing customers) than a more expensive product.

In the e-commerce value network, a key element is the logistics and marketing system, which integrates processes of identifying and creating value with the processes of its delivery. Although in traditional commerce these two areas are sometimes quite antagonised, they must be combined in e-commerce. A lack of integration causes the

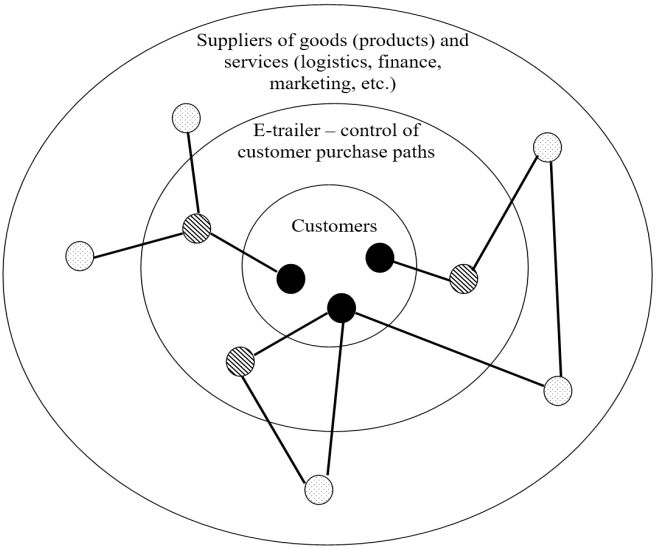
actions creating value in one of them to limit or even diminish the value created in the other one [Ciesielski, Taberski 2010].

Thanks to different sales and distribution channels in e-commerce (multi-channel integrated trade) the customer decides how his/her value chain will run in the entire purchasing process. It is possible to choose the scope and method of obtaining information about products (e.g. in a shop, on the Internet, by phone), about how to test and purchase them (e.g. in a shop, at home), as well as about how to collect and return them (e.g. by courier, self-service terminal). The seller agrees to fact that the customer controls the purchase process (when and how he or she searches for and buys products, how he or she pays for them, how the products are delivered, etc.).

Value network model in e-commerce

Creating and delivering value in e-commerce makes a system comprising a network of simultaneously cooperating companies together with the final customer. The aim of this system is to create value for the customer, the company and its suppliers. The central point of the system is the customer, because it is the customer who ultimately evaluates the value and converts it into a monetary equivalent for the other network members. The value system thus perceived is a dynamic and highly efficient network of customers, e-retailers and suppliers of products and services, based on the flow of information. The value network is created around its customers. The idea of the value network in e-commerce is presented in Figure 2. The e-tailer controls the customers' shopping paths and all possible points of contact between the customer and the company (so-called touch points), hence the location in the model in the inner circle surrounding the customer. The outer circle forms a constellation of suppliers responsible for sources of supply and performance of services. In the case of e-commerce, the following should be mentioned: suppliers of products, logistics, financial or marketing services.

Figure 2. Model of value-crating network in e-commerce



Source: own work.

According to Bovet and Martha [2000], the authors of the general idea of the model described above, the value network should be: tailored to the customer, oriented towards systematic collaboration, agile and scalable (ensuring flexible production, distribution and information flow); fast (rapid material and intangible flows) and digitalized. An important feature of information flows in the e-commerce value network is their multi-directional and often simultaneous nature, thanks to which network members obtain up-to-date information embedded in real time.

Companies with different positions in the value network operate in e-commerce, which may affect their various network governance capabilities (see the classification of five basic types of value chain governance described in section 2). The determinants of network relationships creation in e-commerce are: complexity of transaction, ability to codify transactions, and capabilities in the supply-base [Sturgeon 2008]. It is therefore important not only to know the ways of creating value, but also its division, including the final customer.

The high degree of trade digitalization contributes to relatively large possibilities of codification and standardization of transactions despite the high degree of individualization of online purchases (service scope, payment and delivery form, etc.). On the other hand, due to the entry barrier of IT competence, the e-commerce network focuses on

network participants with a relatively high level of capability. These considerations lead to the conclusion that e-commerce value networks can use models typical for markets or modular governance (large possibilities of transaction codification and high capabilities in the supply-base) in the processes of creation and appropriation of values. This type of relationship may also include customer relationships with e-tailers. However, this situation does not seem to be favourable for e-commerce, which aims at increasing value for the customer. For this reason, the relational mechanism which requires social ties is increasingly used. It is difficult to build them without frequent face-to-face interaction and common social norms. However, this is possible, as evidenced by the customer loyalty studies in e-commerce which showed that online relationship quality positively impacts customer repurchase intention Zhang et al. [2011].

Despite the possibility to change e-retailers easily (it is enough to find another website with the given product), customers increasingly become attached to e-tailer brands or Internet platforms. An example is seeking products by customers who use a search engine of a marketplace or online retail service (e.g. Amazon, AliExpress) as their first choice. One of the mechanisms for building close relationships with customers is social media, blogs, product advice websites, etc. Relational value network governance arises from high complexity of information, high capability of suppliers and low ability to codify information. Only the exchange with complex tacit information based on high supplier capabilities leads to mutual dependence and a relational mechanism of value division.

In the case of relations between e-tailers and suppliers, there are two opposing types of value chain governance – markets and hierarchy value network governance. The former is used for small online shops where the cost of changing the partner and complexity of transaction are low. The latter is, in turn, characterized by high transaction complexity. Examples of hierarchy governance are the so-called e-commerce giants, which try to control most of the value network. For instance, Amazon, apart from online retail services, provides fulfillment (Fulfillment by Amazon) and delivery services (Same-Day Delivery and Amazon Flex). Similarly, Alibaba, which owns a B2B and B2C trading platform as well as Cainiao (logistics service provider), Alipay (third-party online payment platform), creates and takes over a major part of the value in e-commerce.

Conclusions

Value creation lies at the heart of economic development. Recently the issue of value appropriation has attracted increasing interest. The problem of the actual value added, understood as a part of the value appropriated by different economic players in value systems, is inadequately investigated. Theorists often present value creation and value appropriation as competing concepts of the corporation and they are usually described either as customer-driven value creators or competition-driven value appropriators. However, these two processes exist simultaneously and they both coherently describe effects of all economic activities.

This paper examined issues concerning value creation and appropriation in the e-commerce context. Value distribution depends heavily on the place and governance in the value network. Due to the fact that e-commerce is developing very rapidly (new businesses are being created, existing e-retailers develop new products and services, customers change their preferences and requirements), changes in the value system and ways of creating and distributing values can be expected in the next years.

The article is conceptual and its aim was to discuss the determinants of value creation and appropriation mechanisms in the e-commerce context. The conclusions from the analysis are to help in empirical identification of dominant value models in e-commerce. Therefore, the next stage of the research will be to carry out studies using the quantitative method, which will enable to verify the presented assumptions.

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Co-creating Value in the Era of Industry 4.0

Abstract: The main purpose of this paper is to show and discuss the application possibilities of value Co-creation concept, as an extremely effective way of building company competitiveness, especially in conditions and requirements of Industry 4.0 revolution age. Special attention will be brought to submitting (S), tinkering (T), Co-design (CD) and collaboration (C). For each of them, the authors will present a few case study descriptions and thus will try to prove that opportunities provided by Co-creation may bring improved organization competitiveness.
Key words: value co-creation, cooperation, requirements of Industry 4.0, competitive advantage, competitiveness of companies

Introduction

The most important challenge that organizations are facing today is finding the way to shape their competitiveness in the age of new requirements – age of Industry 4.0. The unique Industry 4.0 revolution that is taking place sets high standards in the area of interorganizational cooperation, usage of new technologies, digital transformation (DX) and virtualization of organizational life. Organizations must be able to effectively and dyna-

mically function in network cooperation arrangements, both in real relationships and in virtual activities. They must be familiar with Virtualisation and Robotization, Software Integrations, Machine Communication, and Augmented Reality. Also, in their actions, they should strive to take into account the requirements of not only Mass Customisation and Sharing Economy, but also those of Cybersecurity.

In order to be successful companies, have to be open for cooperation, and moreover such openness has to be multifaceted as organization and her partners has to be able to create diverse & unique values for each other. One of valuable facets is organization-customer relations, so called Co-creation. In the age of technologies developed in the spirit of Industry 4.0, Co-creation gains new possibilities that have not been known so far and, therefore, are not appreciated. As a result, it brings new potential values for companies. Due to the importance of this matter, both to theoreticians and to practitioners of management, it is important to answer the following questions:

1. On what basis and how an effective process of value creation via Co-creation should be performed in the age of Industry 4.0 requirements?
2. What values can be generated for companies existing in the age of Industry 4.0 by Co-creation implemented purposefully and in a multi-aspect manner?

That is why the main purpose of this paper is to discuss the application possibilities of value Co-creation concept, as an extremely effective way of creating values and building company competitiveness, in conditions and requirements of Industry 4.0 revolution age (IR 4.0). As a result of a review of literature on the parameters and requirements of the fourth industrial revolution, on the theory and mechanisms of building competitiveness of companies, and on the theoretical background of the Co-creation concept are collected in the model „Co-creation as a value generator for companies operating in IR 4.0." The model and its key elements are discussed. Particular attention was paid to the nature and role in the process of the main components of Co-creation, namely actions related to Submitting (S), Tinkering (T), Co-design (CD) and Collaboration (C). For each of them, the authors will present a few case study descriptions.

Challenges associated with IR 4.0

The dynamically and uniquely – digitally – directed technical and technological development in the recent years has forced organizations to meet the challenge of another industrial revolution. This is the so-called Industry 4.0 Revolution. This is the fourth technological break-through in the history of the world, which revolutionizes the standard modes of operation elaborated over many years. The 4th revolution is based on the use of cyber physical systems, smart factories, and service innovations [Lee, Kao, Yang 2014; Shamim, Cang, Yu, Li 2016].

The IR 4.0 concept has still, a non-uniform title, and even inconsistent characteristics [*Deloitte* 2015]. In general, the IR 4.0 concept can be characterized as a transformation of production as separate automated factories into fully automated and optimized manufacturing environments. Production processes are linked vertically and horizontally within enterprise systems. Sensors, machines and IT systems are interconnected within the value chain across enterprise boundaries. For this purpose, the Cyber-Physical System is the cornerstone for smart factories [Kopp, Basi 2017]. Its descriptions assume that the nature of IR 4.0 focuses on a merger of real production with the virtual world. As its result, a world arises in which information technology is fully integrated into production processes. Systems in production, logistics, or services will communicate with each other in a new intelligent way. Thanks to IR4.0, production cycles are shortened, customer needs are processed in real time, or maintenance is largely automated. The result of all these are smart factories [DIN 2017]. This explanation appears to be very appropriate because the concept of IR 4.0 originates from a German government project to promote digitalization or computerization, and Germany is playing a leading role in planning the next paradigm shift, and they came up with an idea of IR 4.0 for the fourth industrial revolution [*European Union* 2015].

Due to the fact that the essence of IR 4.0 is most often considered in practice to be skilful implementation of a combination of new IT technologies, Internet of Things mainly, and new production, transport and handling technologies plus new materials and related processes, contemporary organizations must learn to live and function in networks of various types of relationships not only in the real but also in the virtual/cyber plane of activity (in the virtual reality). In order to meet this challenge, they unfortunately must undergo changes related not only to the technologies they use, their organizational solutions, but also the relationships they use and develop and their social competencies. New technologies [Porter 2016; Geissbauer, Vedso, Schrauf 2016] must be supported by concepts and models that are appropriate for IR 4.0 [Berman, Bell 2011], as well as appropriate strategies of both development and competition of businesses [Adamik, Nowicki 2017; Adamik 2016; Adamik, Flaszewska 2015], functional strategies [Chen, Huang 2009], structural solutions [Daft 2015; Paraponaris, Khedhaouria, Jamal 2015], and their supporting relationships, competencies, and social attitudes of employees and managers [Ma Prieto, Pilar Perez-Santana 2014]. Due to the fact that such solutions concern so many different areas, business practitioners often find it difficult to formulate consistent, well-directed, and highly effective programs that prepare their companies to the age of Industry 4.0. What they seem to lack is a kind of an Industry 4.0 guide book. In order to at least partly fill this gap and support business owners in meeting this challenge, the solutions that the authors found to be of key importance to success in the age of IR 4.0 are compiled in Table 1.

Table 1. Guide to the requirements of IR 4.0

Fundamentals IR 4.0	**TECHNOLOGIES**	**1.** New technical solutions (*Virtual Reality, Augmented Reality, Neural Networks, M-to-M Communications*) **2.** Digital enhancement; software integrations, Cybersecurity, Cyber Physical Systems (*CPS*) i.e., computer networks, embedded actuators, sensors **3.**Innovative methods of use big data (*Big Data Analytics*) and collect them (*Clouds*) **4.** Industrial Internet of things (*IoT*); Internet of Services (*IoS*) **5.** SMART work environment: machines, processes, systems, products, production, supply chains factories **6.** Robotization, Artificial Intelligence **7.** Technical solutions of mass customization **8.** Technical solutions for creating the supply chain more effective and flexible **9.** Instruments of getting timely information of customer needs and wants **10.** New technology of production e.g. Just in Time production
Fundamentals IR 4.0	**STRATEGIES**	**The Most Important Types of Strategies:** Relational, Differentiation, Efficient time to market entry, Effective Knowledge Management, Cooperation(*strategic partnering; network cooperation, strategic alliances; strategies of coopetition*)
		The Most Important Strategies' Characteristics: **1.** Strategies of creating innovative capability, both at the individual and organizational level **2.** Strategies in which innovations are taken as part of the organizational routine **3.** Strategies of creating of collaborative work environment **4.** Strategies which can strength core competencies of organizations by acquiring the latest knowledge and converting this knowledge into core competencies **5.** Strategies with capability of changing their direction as per changes in the environment **6.** Strategies which are developing longer term dynamic capabilities **7.** Strategies which use staffing, training, performance appraisal, job design, and compensation **8.** Strategies with the training programs which are focused on increasing the skill variety of employees **9.** Strategies with system of rewards for organizational, individual & group level performance **10**. Strategies with extensive job rotation and delegation of responsibility & authority, flexible assignments
Fundamentals IR 4.0	**STRUCTURAL SOLUTIONS**	**The most important features:** **1.** Organic organization design, not very formal; with flexible rules and policies **2.** Decentralization, Empowerment of employees **3.** Flexibility in the organizational structure according to the needs of the situation **4.** Horizontal communications **5.** Collaborative team work, introducing into the organizational structures the so-called „creative teams"
		The most important types of structures: **1.** Structures which can respond to changing situations and uncertainty very promptly (*network structure, hybrid structure*) **2.** Structures which can be an effective source of interdepartmental knowledge sharing (*matrix structure, project based teams*) **3.** Structures which put multiple functions and processes in a single group heading towards common objectives (*team based structure*) **4.** Structures which enhance generalist skills, and a speedy decision making process (*team based structure*) **5.** Structures which facilitate quicker decision making due to the closeness of top management to employees (*flat hierarchy*) **6.** Structures in which responsibility and authority for decision making is usually transferred to the lower staff levels (*network structure*)

Fundamentals IR 4.0	**ATTITUDES & SOCIAL COMPETENCIES**	**The most important competencies** **1.** Capable of working in smart, uncertain, and competitive environments **2.** The ability to work in a multicultural and global environment; Teamwork skills **3.** The ability to work remotely/on-line; High level IT and language competencies **4.** Goal orientation and openness to new experiences, Cognitive ability, and creative self-efficacy. **5.** New technology acceptance **6.** Innovative behaviour; flexible thinking; agility; lifelong learning, developing new skills, eagerness for self-improvement **7.** Creative work behaviour; innovativeness, knowledge; design thinking & problem based thinking
		The most important attitudes of managers: **1.** Creating of training, learning, and innovation capability **2.** Tolerating mistakes, and adopting a capability oriented supervisory style **3.** Participation of employees in the decision making process and other business discussions **4.** Knowledge oriented leadership; transformational leadership; authentic leadership; transactional leadership **5.** Intellectual stimulation, and inspirational motivation

Source: prepared by the authors.

It appears that the synthesis presented above, which was prepared based on a review of international literature on this topic, quite clearly demonstrates that the changes unleashed by the revolution of Industry 4.0 are so profound that, from the perspective of human history, there has never been a time of greater promise and their associated transformations. Organizations should strive to take the fullest advantage of the opportunities provided to them by technologies.

Co-creation from the standpoint of IR 4.0

In the opinion of many researchers, due to the constantly increasing speed of the changes and the growing turbulences in the environment, contemporary companies face great pressure associated with the need to take more and more numerous and organizationally difficult adaptation actions in an ever-shorter time [see: Mahr, Lievens, Blazevic 2014; Hakanen 2014]. Naturally, this is associated with the realities of IR 4.0 and the challenges that are typical of it. A very important component of those actions is finding a way to shape high value, whereby it must be emphasized that, due to the occurrence of new requirements, the methods that have been used so far have become depreciated and are no longer sufficiently effective. In the opinion of researchers working on this matter, the basic issue of strategic importance is more and more often implementation of modifications and reconfigurations of business models. Of special importance are the methods and techniques of shaping the relationship networks and the cooperation bonds, espe-

cially in the context of value creation. This proposition is connected with the nature of Co-creation [Ramaswamy, Ozcan 2014; Prahalad, Ramaswamy 2009], which is a relatively new and innovative approach to the problem of co-creation of value.

This concept describes where and how "value for the customer" is created [Prahalad, Ramaswamy 2009] and constitutes a kind of a bridge that connects two opposite dogmas: the traditional company-centric view (1) vs. the consumer-centric view (2). In the context of the new realities and challenges associated with IR 4.0, organizations should strive to be able to better study, see, and understand value creation processes. To do so they must see it from the point of view of their customers. Then they will be able to conduct effective and productive cooperation so as to Co-create a value that is more satisfying to both parties [Prahalad, Ramaswamy 2009]. Based on studies of the literature on this topic [Bharti, Agrawal, Sharma 2015; Choi, Burnes 2013; Aarikka-Stenroos, Jaakkola 2012], it was assumed that Co-creation is a specific form of strategic action that is strongly rooted in an open organizational culture, i.e. a focus of the organization consisting in that in their actions, instead of using a strategy consisting only in imposing own specific solutions on the market, the organization strives to involve various external persons or entities interested in cooperation in processes of designing, creating, and developing new products and services so that, as a result of discussions and sharing of ideas, their experiences can be used.

Functioning based on the Co-creation model is a challenge faced by managers of contemporary organizations. In the context of IR 4.0, it appears to be a necessary step, especially considering [O'Hern, Rindfleisch 2010; Sandor 2017]:

- a constantly growing quantity of operational data required in order to ensure effective operation becoming outdated, with the resulting information asymmetry associated with insufficient effectiveness of systems (methods/techniques) used for acquiring, analysing, and exchanging information that describes the expectations of customers, in the context of the ability of the organization's offer to satisfy them;
- growing acceptance of the opinion about the growing importance of unique and personalized methods of shaping of satisfaction of customers who make individual decisions = individual customer empowerment;
- a dramatic increase in the pace and strength of popularization of more and more advanced digital and virtual technologies = intense use of Virtualization & Digital Transformation solutions (V&DX).

In order to correctly guess the expectations, tastes, and needs of potential customers (stakeholders), companies must find an effective way to quickly and effectively acquire and process "external" information, data, knowledge, ideas, opinions, suggestions, proposed solutions – all described by the generic word „feedback." Contemporary customers have high expectations and want to be treated in an exceptional and individual

manner. They want to feel that they can be different, that their individual needs and expectations are properly interpreted and satisfied. In order to meet this challenge, it is necessary to "walk in the customer's shoes" in accordance with the rule that "the customer himself knows what kind of value he wants the most". In practice, this means that for companies that want to build a strong competitive potential, implementation of the Co-creation concept is the right thing to do. Co-creation brings the unique blend of ideas from direct customers or viewers or stakeholders which in turn gives a plethora of new ideas to the organization. Co-creation is not about the firm trying to solely independently (without listening what the client has to say) please the customer, it is about joint creation of value by the company and the customer [Prahalad, Ramaswamy 2009]. The third of the aforementioned premises is directly linked to the realities of IR 4.0, especially one of its aspects: Virtualization & Digital Transformation (V&DX). The essence of it places a strong emphasis on the integration of digital technologies and business processes, as well as on the implementation of organizational and technological changes, in particular through an increase in the use of digital technology, information and telecommunications on an unprecedented scale [Bender, Willmott 2017; Berman, Bell/IBM, 2011]. Importantly, V&DX also means a change in the way planes, i.e. places that are best suited to a given company's individual needs in achieving maximum profits at minimum costs [Cifranic 2016], of business activity are perceived [Audretdch et al. 2015]. A real plane of business activity should be complemented by its virtual counterpart. i.e. the virtual plane of activity. It is interpreted as: embedding, conducting and promoting economic activity on the virtual plane of action, i.e. using the support of innovative, specialized IT/ICT tools and solutions associated with DX. These changes should be strongly supported by digitalization, transforming activities and things on the real plane of operation into virtual ones through the implementation of Big Data, Cloud, IoT instruments that allow to ensure close integration of all business processes and systems, transparency of information and efficient communication systems [Dubois 2017; Soon 2016; Geissbauer et.al. 2016; Marr 2016].

An analysis of the issues associated with the challenges of IR 4.0 and with the nature of the Co-creation concept made it possible to identify and visualize the role of Co-creation as the generator of broadly defined value for organizations whose task is to effectively compete in the IR 4.0 environment. Review of the literature about Co-creation allowed to identify key benefits for organizations that want to shape their competitiveness in the age of I.R. 4.0 (see table 2).

Table 2. Key Co-creation benefits in the Age of I.R. 4.0

		Co-creation allows organizations to…
KEY BENEFIT	1	… explore plenty-potent source of innovative, attractive and original business ideas.
	2	… increase client and stakeholders engagement & loyalty (support).
	3	… improve the service/product quality.
	4	… stimulate employees motivation.
	5	… reduce, diversify, manage and mitigate costs and risks.
	6	… stimulate the possibility of obtaining the marketing and resonance advantage.

Source: based on: Frow, Nenonen, Payne, Storbacka 2015; Agrawal, Rahman 2015; Galvagno, Dalli 2014; D'Alleva 2012; Romero 2011.

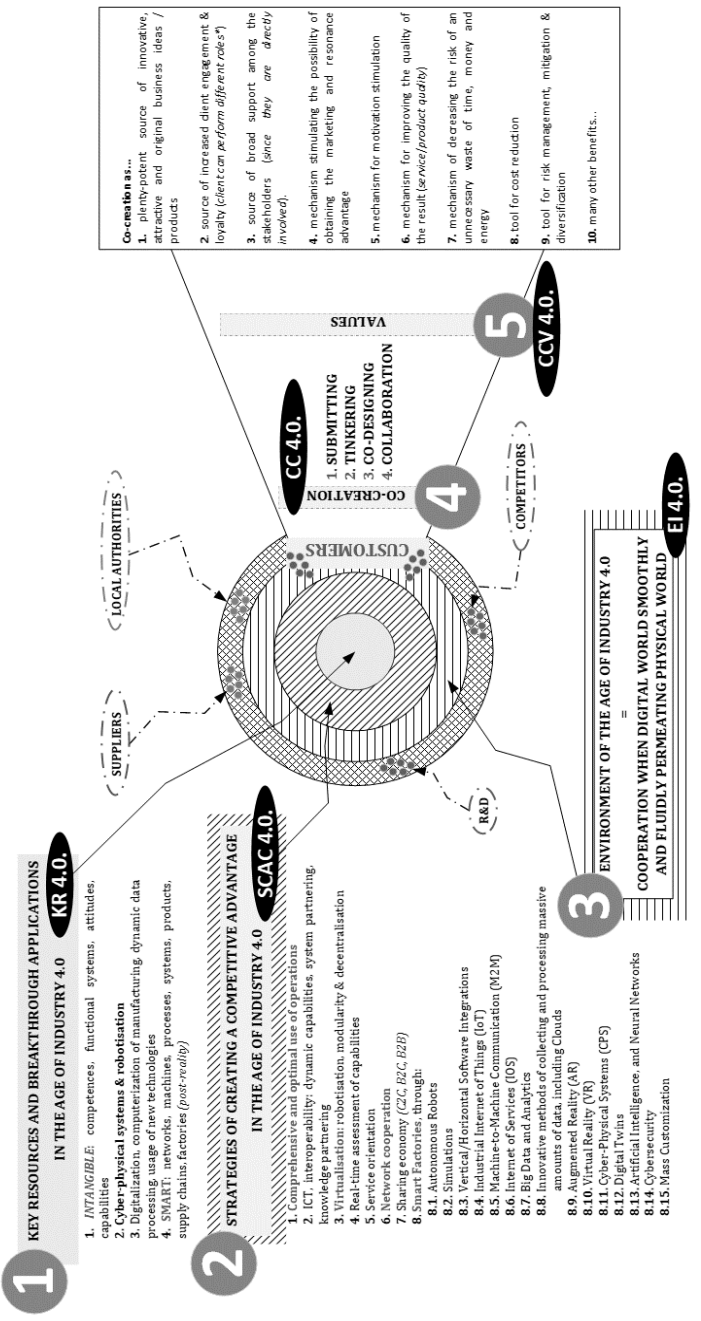
Furthermore, authors were able to create a prototype of a model of „Co-creation as a value generator for companies' operating in the age of IR 4.0". It is shown in Figure 1, while its structure and components are described in the table 3.

Table 3. Structure and components of "Co-creation as a value generator for companies' operating in the age of IR 4.0" model

Steps	Characteristics
Step 1 Collecting Key Resources 4.0 (*KR 4.0*)	Building the core of "value generator in the age of IR 4.0". It is the set of key resources and breakthrough applications intangible resources and the skills related to creation and operation of Cyber-physical Systems & Robotization, Digitalisation, Computerization of Manufacturing, Dynamic Data Processing.
Step 2 Creating Strategies of CA 4.0 (*SCAC 4.0*)	The usage of new technologies in order to create SMART networks, machines, processes, systems, products, supply chains, and factories. It constitutes nowadays the starting point for effective generation of different paths for creation of competitive advantage in IR 4.0
Step 3 Understanding of The Environment Industry 4.0 (*EI 4.0*)	Market success in the age of IR 4.0 requires broadly defined cooperation between organizations. Such cooperation must be performed simultaneously on many levels and in many areas on each of those levels. The basic planes are the real and virtual planes of activity of the organization. In the age of IR 4.0, the digital world is smoothly and fluidly permeating the physical world of organizational life. This applies to their interior and to their relations with all stakeholders - suppliers, competitors, local authorities, R&D organizations, as well as to their relations with customers.
Step 4 Implementing of Co-creation 4.0 (*CC 4.0*).	The "customers" group has in the recent years been an especially important source of possibilities and support for value generation processes, but has been undervalued by many organizations. Cooperation with customers, referred to as Co-creation, that is interpreted and used in a modern way, is a determinant in the age of IR 4.0 of longevity and market success
Step 5 Exploiting of Co-creation 4.0 Values (*CCV 4.0*)	Purposeful design and inclusion in competition strategies of companies of Submitting (S), Tinkering (T), Co-designing (CD), or Collaboration (C) results nowadays in unique values. The quality of solutions created in this way, their quite inexhaustible potential, and the exceptionally high interest of customers in those solutions resulting from the customers' involvement in their creation, combined with relatively quick commercialization and market acceptance result in a real demand that indicates possible profits and competitiveness of the activities

Source: prepared by the authors.

Figure 1. Co-creation as a value generator for companies' operating in the age of IR 4.0



Source: prepared by the authors.

When developing new products using Tinkering, companies study opinions of their customers, analyse the results, and create new (or improve the existing) products/services – initially themselves. However, customers may modify the products/services after they have been marketed as after the products are launched, the companies provide tools/instruments that enable further development of the products by the customers/buyers. The companies maintain the right to decide whether a modified version (proposal) of improved products will be offered (under the company's brand and control) in the market - the companies continue to be the only official distributors of the products. O'Hern and Rindfleisch point that tinkering is an attractive proposition for companies as it provides a level of control and restriction for the customers whilst the firm still obtains valuable and critical insight from the customers on their preferences and expectations [O'Hern, Rindfleisch 2010].

Co-designing is the third form of Co-creation. On this level of cooperation, when developing new products, companies present to the public a general concept of the product (a design / a prototype) that can be modified/expanded to a large extent thanks to the involvement of the customers. Their level of involvement (mostly financial, but often also in other areas) determines how sophisticated the final product is. This means that, unlike in Submitting and Tinkering, the customers exercise a greater level of control over how/when/where the value is created than the company because [O'Hern, Rindfleisch 2010]:

1. Co-designing is a narrower and more targeted cooperation between the company and a smaller group of customers and it relies on significant input from the customers free of significant boundaries;
2. while Co-designing company exercises control over the contribution activity while the public exercises control over the selection activity;
3. Co-designing involves placement of constraints by the firm on the contribution activity and selection of the winning contributions by the contributors themselves.

Collaborating is the most open form of Co-creation and products launched in the market are the result of full cooperation with a large group of stakeholders who greatly influenced the decisions concerning the parameters of the product, the materials used to make it, and its basic and additional functionalities. When creating products/services, companies are also open to suggestions concerning how they should be produced and distributed. In the case of electronic products (software, games, applications, etc.), they are launched in the market in an "open source" version, which means that they are provided with the complete source codes and with tools that were used to create them. Unlike in Tinkering, after the launch of the "original product", its modified version does not have to be approved by the company to be offered in the market (transfer of copyrights under an open common license). Anyone who wants to develop/modify the

products in any way is allowed to offer it to the public. Companies are opened to sharing their knowledge, actively support the authors of modified versions of the base products and frequently develop their own versions of the products because, as indicated collaborating is defined as a totally open environment, with a seamless engagement and cooperation between a firm and the customers – collaborating is an ongoing initiative and process without a finite end [O'Hern, Rindfleisch 2015].

Research methodology and results

In order to achieve the objectives of the article, a review and a critical analysis of the literature on the topic, as well as a case study, were performed. The former method was used in the preparation of the theoretical part of the article. The latter was used for empirical confirmation of the hypotheses and assumptions made in the article in order to demonstrate that implementation of Co-creation in the context of the requirements of IR 4.0 constitutes a valuable tool for achievement of success in the market. In the present part, the descriptive method is used and the collected data is presented synthetically in Table 4.

Table 4. Co-creation in IR 4.0 – a list of practical examples

	Practical Examples
SUBMITING	**Concept Craft art workshop**. The company's cooperation with the customer basically comes down to determining: the general purpose and the main functions of the product to be created (1), the raw materials/materials from which it is to be made (2), the buyer's budget/price the buyer is ready to pay for the final product (3) and his/her hobbies/interests that provide an inspiration for design work (4). Then a design process takes place consisting in the preparation of several concepts from which the customer chooses one. The final stage is the creation of the ordered "work/object", e.g.: a rack for a bottle of wine with the function of a decorative lamp (see: http://www.cc-craft.pl/realizacje/wineholder) **Printor Sp. z o.o.** is a provider of comprehensive services in the area of manufacturing of electronic products; the basic line of business of the company is manufacture of printed circuit boards and assembly of electronic equipment. The company performs testing services on both subassemblies and finished products. The company's offer also includes production of prototypes, which enables verification of the technical and economic assumptions made for products and possible correction of the design prior to its mass production. The company has prepared a special offer for its key customers, which consists in provision of warehouse space for electronic subassemblies that are used to manufacture their products. **IKEA** and its applications that enable customers to prepare customized designs of entire rooms or individual furniture (http://www.ikea.com/ms/pl_PL/rooms_ideas/splashplanners.html): - a kitchen and bathroom planner; - BESTA/UPPLEVA planner→ design a perfect audio-video set or a storage set for your living room; - PAX planner→design a PAX wardrobe that perfectly meets your requirements; - ALGOT planner→design your own storage system that meets your needs; - VALLENTUNA / VIMLE / SÖDERHAMN planner→design your perfect sofa.

TINKERING	**Steam Workshop** operating within the Steam (http://steamcommunity.com/workshop). This application allows the community to prepare custom modifications and extensions to games/programs/applications available on the Steam platform. Developed solutions (extensions/add-ons) are then sent to the Steam platform, either as modifications officially supported by the developer/distributor of the original product/service, or as unofficial versions. In the latter case, the developer of the original product/service is relieved of liability if after installing the modification/extension, there are any problems in the operation of the product/service. **The example of Tinkering is X:COM 2 game**. **LEGO** (https://www.lego.com) → Lego has always been a toy company at the forefront of innovation. One of their greatest resources for innovation? Their customers. LEGO's online community allows fans to submit their own ideas for new sets and vote on the suggestions that they like the most. If a project gets 10,000 votes, LEGO reviews the idea, picks a winner, and creates a new LEGO set that is sold worldwide. In return for the great idea the creator gives final product approval, earns a percentage of the sales, and is recognized as the creator on all packaging and marketing. **Fast food restaurant chains, such as McDonalds / KFC / Burger King / Pizza Hut, etc**., organize contests with the objective to acquire unique ideas for their menu items. Participants of the contests use special applications to design their dishes (e.g. new types of hamburgers) with ingredients/semi-finished products available in the application (used by the specific fast food chain). The proposed dishes that win the largest number of votes may be added to the restaurant's menu permanently or at least for a short promotional period.
CO-DESIGNING	**Kickstarter platform**[1]. The platform is used by both individual authors (individuals) and by small independent developer companies, especially those active in the electronic entertainment sector and the computer game sector, for example the company that developed the computer game titled **Divinity: Original Sin**. The Larian Studios LLC developer studio used the Kickstarter platform and "promised" to add new content to the game if specific levels of contribution of the community are achieved. Other examples of Collaboration are: - **Crowdfunding/crowdsourcing platforms**, e.g.: https://wspieram.to (universal), https://polakpotrafi.pl (universal), https://www.patreon.com (preferred project types: ones related to culture and art - the objective is to provide financial support to authors and to build bonds between the world of culture and the society), https://www.siepomaga.pl (preferred project types: charity projects), http://scienceship.com (preferred project types: scientific ones - the platform focuses on financing of scientific and research projects); - **DHL** - is the world's largest mail and logistic services company, but knows that its customers can always suggest new ways to improve their delivery methods. DHL hosts workshops with customers in Germany and Singapore where they help them to create solutions and improve the experience for customers around the world. DHL's customers are helping them to design the logistics services company of the future. Co-creation saw the development and testing of a delivery drone that would reduce standard mail-delivery drop from half an hour to just 8 minutes (see more: http://www.dhl.com - Successful Trial Integration of DHL Parcel copter into Logistics Chain).
COLABORATING	**Linux operating system** (www.linux.com). Linux is an example of Free/Libre Open Source Software (FLOSS). Its source code can be used, modified, and distributed by anyone and in any way. The most important versions of Linux that are distributed (distrowatch.com) are: Mint, Fedora, Ubuntu, openSUSE, PCLinuxOS, CentOS/Red Hat Enterprise Linux, Arch Linux, Mandriva Linux, Slackware, and Debian GNU/Linux. Other examples of products/services that were created and are constantly being developed with the support of many independent authors are: - **KODI** → a multimedia management application (https://kodi.tv); - **Minecraft** → a computer game (https://minecraft.net); - **Apache** →an open HTTP server available to many operating systems (https://httpd.apache.org).

Source: prepared by the authors.[1]

[1] Kickstarter is an enormous global community built around creativity and creative projects. Its mission is to help artists, musicians, filmmakers, designers, and other creators on their path of finding the resources and support they need to make their ideas a reality (see more: www.kickstarter.com).

The examples presented herein clearly demonstrate that Co-creation is used and plays an important role in the functioning of a growing number of effectively managed organizations. Based on the growing popularity of involvement of companies and their stakeholders in Co-creation, and the measurable benefits thereof, one can conclude with certainty that Co-creation is a tool that supports competitiveness in the age of IR 4.0.

Conclusions

As a fairly new concept, Co-creation appears to be underappreciated. So far, it has not been utilized, either in the literature or in broadly defined business practice, to an extent that is appropriate given its role. Given the dynamic and demanding environment present in the age of IR 4.0, this is a big mistake. The benefits of Co-creation to organizations that are described in the literature appear to be evident and significant. It is a pity that few companies decide to purposefully take advantage of them. So far, due to the unique characteristics of Co-creation, it has been utilized mostly by companies that are managed in a modern way, that have adopted courageous development strategies, that are open to cooperation, and that are not afraid of experimenting with new technologies.

Given the requirements of IR 4.0, all organizations should be active in this area. Use of the opportunities provided by Co-creation may bring improved competitiveness and level of advantages used, and other types of values to many organizations. It appears that the results of the literature studies that compiled the nature of the requirements of the age of IR 4.0 with the unique characteristics, the benefits, and the forms of Co-creation, and the accompanying synthesis, and visualization of the problem in the "Co-creation as a value generator for companies' operating in the age of IR 4.0" model that was developed and in the case studies constitute an interesting contribution to the process of raising of awareness of the possibility of competition among companies in the age of IR 4.0. It has the opportunity to raise the interest in Co-creation not only among scientists but also among practitioners. The authors hope that the article will become an inspiration to initiate, continue, and extend studies of more effective and broader involvement of customers in creation of values generated by organizations in the age of IR 4.0. This is because of the increasing importance in the 21st century of the ability of organizations to cooperate with the broadly-defined environment, both real and virtual. Another important factor is the growing technological, methodical, legal, financial, and social support for such activities. Thus, the recommendation is to study the possibilities and conditions of implementation of Co-creation in various sectors using various modern 4.0 technologies, and to develop procedures that facilitate studying the readiness for Co-creation of both companies and their customers.

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Reconnaissance of the Ability to Profile a Business Model Focused on Market Niches – Expert Self-assessment in the Machine Sector

Abstract: The constitutive purpose of this thesis is an attempt to answer the question: to which degree are Polish production companies operating in the agricultural machinery sector able to profile a market niche-oriented business model? Do the resources and skills held by a company respond to the current needs in this respect? Is there a hierarchy of importance of particular abilities in the assessment of experts (owners and managers); if so, what is it?

Achievement of the main goal has required to phrase and fulfil the cognitive, methodical and practical partial goals, the attainment of which was necessary to develop a method of assessment of the ability to profile a business model focused on market niches.

Key words: profiling ability, business model, market niche, flexibility, machine sector

Introduction

The dynamic changes occurring in the environment are a factor supporting the formation of market niches [Blyler, Coff 2003, Teece 2007][1]. The condition for success, on the basis of the market niche strategy is good knowledge of the market, and consequently – satisfaction of non-standard buyers' requirements in a given area. Such a business model requires certain resources and skills from the entrepreneurs, which enable effective competition in the niche.

In the context of the above a research was started to attempt to answer the question: to which degree are Polish production companies operating in the agricultural machinery sector able to profile a business model focused on market niches? Do the resources and skills held by a company respond to the current needs in this respect? Is there a hierarchy of importance of particular abilities in the assessment of experts (owners and managers); if so, what is it?

Achievement of the main goal has required to phrase and fulfil the theoretical (cognitive), methodical and practical partial goals, among which the attempt has been distinguished to develop a method of assessment of the ability to profile a business model focused on market niches. Conduct of the conceptual study of the method was preceded by an extensive analysis and systematization of the experts' previous achievements, including professional knowledge. Based on this, a set of resources and skills implying the composition potential of the market niche-oriented business model has been compiled.

Position of the authors – starting point

A desirable feature of a modern company is the dynamics in response to the occurring market opportunities reflected in the capability of continuous search for uniqueness, systematic introduction of innovations, as well as flexible action and organisational learning.

Therefore, the key is the ability of the business to acquire and allocate resources[2], including technological [Eisenhardt; Martin 2000; Teece 2012; Christensen 1995; Garrouste; Saussier 2005], relational, and financial resources, as well as knowledge implying its potential for profiling a market niche-oriented business model.

[1] Environment attractive for companies that are looking for flexible specialization and technological niches [Amin 1994; Autio 1997; Carnabuci; Bruggeman 2009; Hirst; Zeitlin 2006]

[2] Gathering valuable, scarce and unique resources, businesses can, thanks to them, create competitive advantage [Barney 1991; Hunt; Morgan 1995].

It is a derivative of the skill of collecting, integrating and using the means of production, the subjects of work and available technologies, which, taking advantage of the knowledge and predispositions of executive employees, through acquired experience, adopted attitudes, behaviours and ethical standards, enable the implementation of the production process focused on pursuing an independently emerging or created market niche.

It seems that complexity of the problems and little so far scientific recognition justify considering these issues as the subject matter of the research. Despite the wide interest among the researchers, the outlined issue is still not sufficiently described and specified; according to the authors, it leaves some issues unresolved. In the subject literature, it is mainly characterised in the ideological area, and though there is a description of business models that can be used, there is a need to conduct research in the field of their profiling skills. By selecting the discussed issues, efforts were made to maintain certain logical consistency of the conducted deliberations, at the same time showing the connection between theory and management practice. However, the presented deliberations – due to the publishing requirements – omit the conceptual and terminological issues[3]. They focus on showing practical solutions in the context of the undertaken issue[4].

Material and methods

The research has been conducted with regard to Polish production enterprises operating in the agricultural machinery sector (2017–2018).

In order to achieve the purpose of the paper, both preparatory research [B_1, B_2] and the proper research [B_3, B_4] have been conducted.

In the first stage of the research, the authors applied the method of literature studies. Such procedure has made it possible to create the basis for the deliberations focused on constructing a theoretical set of the determinants directly affecting the ability to profile a business model focused on market niches.

In order to prepare the sheet constituting the tool to conduct the proper research, in the subsequent, preparatory stage of the research [B_2], the authors used comparative methods[5], observation methods (self-observation) and a case study.

Based on this, the assessment sheet has been prepared, being the tool to conduct the first stage of the proper research [B_3].

[3] Especially that these deliberations function in the scientific literature in this field [Falencikowski 2013, pp. 19–38].
[4] It has been assumed that the issue of profiling the business models should be a priority for scientific recognition in the sphere of assistance in management sciences for contemporary companies.
[5] The comparisons were referred to the manufacture of the automotive industry.

Due to high diversity and multiplicity of the distinguished determinants, their order and grouping has been made using the expert method[6]. The originally prepared list of 55 capabilities was subjected to discussion among 11 intentionally selected experts[7].

As a result of these determinations, a list of 11 factors has been prepared. They have been operationalised on the basis of the assumptions of the ABC method[8]. In this way, the tool focused on conduct of the proper study has been prepared.

The first stage of the proper research [B_3] was completed on 22–25 September 2017. The research was conducted during meetings and direct conversations conducted at the International Agriculture Exhibition AGRO SHOW organised by the Polish Chamber of Commerce of Agricultural Machines and Devices. Within the framework of the study, interviews were conducted among 57 intentionally selected experts representing the intentionally selected companies.

Among the group of practitioners, owners and co-owners of the companies were distinguished – 35 persons (61.40%); 48.57% – had higher education, 34.29% – secondary education, 17.14% – professional education; 11 persons were over 50, 13 persons were 40-50 years old, 9 persons 30-40 years old, 2 persons below 30 years old) and 22 managers (38,60)[9]. 81.82% of the managers had higher education, on the contrary, 18.18% – secondary education; 2 persons were over 50 years old, 13 persons were 40–50 years old, 7 persons 30-40 years old, 3 persons below 30 years old. The experts represented the following enterprises: micro – 4 persons (7.02%), small – 21 persons (36.84%), medium – 24 persons (42.11%) and large – 8 persons (14.03%). Micro, small and medium enterprises dominated among the entities selected for the research (85.96%).

The second stage of the proper research [B_4] was conducted on 18-21 January 2018 in Poznań (Poland), at the International Agricultural Fairs POLAGRA-PREMIERY. The respondents made a self-assessment with regard to the ability to profile a business model focused on market niches[10]. 73 intentionally selected experts were originally invited for the research, 69 persons (94.52%)[11] of whom took part. The experts represented the fol-

[6] It has been assumed that introduction of numerous variables strongly complicates the possibility of realizing the further stage of the research; would prevent formulation of some material conclusions. Long time of the survey, the need to respond to many questions, will discourage managers from the self-assessment.

[7] The group of consultants included two persons being members of the Scientific Council of the Industrial Institute of Agricultural Machines, a representative of a university specializing in management strategy, Business Centre Club expert in SME management strategy and innovation development, and owners of businesses from the examined sector (7 persons).

[8] It has been adopted in the paper that key abilities will be indicated by a subset being 20% of the whole set.

[9] The authors included in the group of managers persons holding managerial functions in the company, but having no more than 10% of ownership interest.

[10] The experts subjected to the research are eminent managers, who, due to the practiced "profession", have many occasions to collect information on their own organisation and therefore they can assess its reconfiguration potential.

[11] The following were invited to the research: a) owners of companies – 41 persons (59.42%); of whom: 53.85% of the owners had higher education, 35.90% – secondary education, 10.26% – professional education; 13

lowing enterprises: micro – 7 persons (10.14%), small – 21 persons (30.43%), medium – 32 persons (46.38%) and large – 9 persons (13.04%).

By considering communication barriers and availability, the persons invited to the research were those with whom meetings were planned and thus there was a possibility of a direct interview. The intentional selection technique as well as the possibility of conducting research at the time of industry meetings have undoubtedly contributed to the high effectiveness and quality of the research.

Results of the authors' research

Desired capabilities – postulated state [B_3]

The ability to profile a market niche-oriented business model is in strict association with the multiplicity of contextual variables that shape it. In the paper, an attempt has been taken to partially identify them.

The creation of business models, with regard to industrial companies, implies the ability to re-allocate production resources. It is important to produce effectively, without unnecessary wastage, ensuring acceptable quality. This means the ability to introduce new resources and production methods as well as their integration with the already existing production systems. The application of modern means of production, work objects and advanced technology, in the opinion of the surveyed respondents, significantly determines the manufacturer's ability to profile a market niche-oriented business model (average score 4.94; 94.2% of the indications for 5-point score)[12]. Attention was paid to the ability of companies to prepare and implement their own methods in this regard; therefore, it is important to have universal machines, tools and devices, which, through a respectively developed method of performing a production task, make it possible to broadly process raw materials, materials and items, a proprietary method of performing tasks;

owners (33.33%) was over 50 years old, 17 owners (43.59%) were 40-50 years old, on the contrary, 9 (23.08%) were 30-40 years old), b) managers – 23 persons (33.33%), of whom 6 persons held the position of the president of the board of directors; 65.22% of the managers had higher education, 30.43% secondary education, while 4.35% – professional education; 7 managers (30.43%) were over 50 years of age, 8 managers (34.78%) were 40-50 years old, 6 managers (26.09%) 30-40 years old, 2 persons (8.70%) were below 30 years old, c) members of the board of directors – 3 persons (4.35%), d) board representative (1.45%), e) proxy (1.45%).

[12] Additionally, manufacturers who focus on standard manufacturing forms can faster adapt the product to the client's specific requirements. The excessive automation reduces the possibility of manufacture of short series.

In order to produce other goods and services, suitable financial resources are necessary. Financial resources are the tool to acquire other resources for the organisation, therefore, they are a criterion of its implementation ability. The resources being at the disposal of the enterprise determine the possibility to build sustainable competitive advantage and raise the value of the company, as confirmed under the research. In the opinion of experts, it is the funds that significantly affect the ability of the company to develop and implement the market niche-oriented business model (average score 4.94; 88.4% of the indications for 5-point score).

The attention of enterprises should be, thus, focused on the specific allocation of resources that will permit long-term value to be created under a partner relationship. The subject of interest are thus business models that add dynamics to market niches, the implementation of which – allowing individualized value to be delivered to the priority client – is determined by the abilities to create partner relations with the environment (average score 4.87; 89.9% of the indications for 5-point score).

When designing a manufacturing process which implies – within the specific niche – implementation capacities, account should be taken of the fact that the collected system resources may differ from the resources required for its execution. Therefore, important is the manufacturer's ability to produce instrumentation using his own resources (average score 4.87; 88.4% of the indications for 5-point score). Having the available suppliers is also stressed (average score 4.86; 85.5% of the indications for 5-point score)[13]. It is them who significantly imply the companies' abilities to configure business models that add dynamics to market niches.

Manufacturing company managers and owners, looking for maximized profits, seek solutions aimed at reducing high production costs. In view of the foregoing, such management concepts and methods started to be sought, the primary purpose of which is to eliminate losses before they appear in the production process, at the same time contributing to reduced functioning costs of the enterprise. The direction forced by the market in this respect is the application of the lean management concept. The implementation of the lean management culture principles makes it possible to track production processes in real time and raise their productivity. Supervision over the input material moving across the given technological operations, full identification of the persons performing the operations, are only some advantages of using modern solutions related to lean production. The activities referred to above are key when profiling the market niche -oriented business model (average score 4.86; 4.86% of the indications for 5-point score).

[13] Here indicated are design, selection and integration of different links in the network as well as coordination and synchronization of their operation. It is important to build bonds and dependencies between companies, which become participants in the supply network.

Becoming familiar with production conditions, analysis of design in terms of technological capacities, consultations with the constructor, semi-finished product selection, preparation of the general technological process, division of the technological process into component parts, selection of machining tools and parameters as well as selection of instruments and treatment handles are just some of the activities that are significantly determined by the availability of a proprietary design office and the constructors team. The above-mentioned properties are therefore regarded as the ability which allows profiling of a business model focused on implementation of a niche product (average score 4.84; 84.1% of the indications for 5-point score).

Another market niche-oriented business model profiling ability is applicable to acquisition, maintenance and development of cooperation with other market participants. This concept involves the formation of new implementation possibilities by the company's ability to take advantage of technological solutions as part of cooperation in the sector and on the market. The ability to commercialize relations with partners is important, so as to ensure that both parties achieve their goals[14]. Close cooperation among enterprises, based on the principles of partner cooperation, enables fast operation and diagnosis of the changing needs and expectations, preferences of customers, depending on the situation and organisational, technology and marketing development. The relations between the contractor and the service supplier often consist in common launch of new products, their improvement and creation. Therefore, the earlier built partnership between the parties makes it easy to introduce solutions implying construction of the market niche-oriented business model (average score 4.72; 73.9% of the indications for 5-point score).

Modelling appropriate attitudes among the executive employees, resulting in acceptance of new technologies, provoking respective attitudes to be demonstrated in the appropriate way, creating relevant principles fostering activity, and increasing the level of responsibility among contractors, are all perceived as essential from the point of view of the market niche-oriented manufacturer's ability (average score 4.58; 7.0% of the indications for 5-point score). Therefore, it becomes necessary to develop the proper standard of leadership. As a result, an employee knows according to which principles the organisation operates, how the decision-making processes function. It is important to get to know the process and the people working at it. It is important to establish good contact with the employees, who in the future, instead of concealing problems, will begin to openly talk about them. The leader is the initiator; well-oriented in what is happening in the company, he or she is able to initiate the change process. Subsequent leader's tasks involve development and showing support for the employees. Such

[14] In order for the relations between the parties to be established and then strengthened, all the partners must have benefits.

leader, as a result of these actions, creates a team which develops, is independent and focused on rapid production growth, which characterises the development of a contemporary enterprise.

In his or her work, the leader often deals with situations that require creative, non -stereotypic and innovative thinking. Simultaneously, the time he or she has to make the right decision is usually quite restricted. Then, intuition and sense are useful as nowhere else. They enable association of the present situation with one previously known from training, courses, literature, or one's own experience. Therefore, these mental capabilities are regarded as resources playing an important role in the process of composing a business model focused on niche products (average score 4.52; 59.4% of the indications for 5 point score). The above is confirmed in the views promoted by the authors. Practical experience allows them to state that intuitive decision making is regarded by leaders as almost as valuable as the reasonable and analytical decision-making process. Generally, it is claimed that there are some circumstances and situations when reference to intuition is the most useful or almost the only basis for making decisions. Intuition is thus an important ability, very helpful in management. As such it may be used to increase organisational productivity.

Under the conditions of variable environment, the issue of creative business management becomes not only a domain of theoretical interests, but a guideline for managers in building new business models. In the context of the above, the ability to devise new solutions to the already existing problems, the ability to generate new and valuable ideas and concepts – in the opinion of the experts subjected to the study – is a key factor in profiling the market niche-oriented business model (average score 4.51; 60.9% of the indications for 5-point score).

The success of the organisation has ceased to be only a result of skilful investment and use of capital. Contemporary enterprises must cope with the demand for custom -made products which forces exceptional solutions especially with regard to the organisation of manufacturing processes.

Management has never been an easy art. Now, in spite of the applied technologies, the situation is even more complex just due the abundance of the supporting concepts. Therefore, research concerning the abilities to profile a market niche-oriented business model should be conducted in terms of their consistency with the currently applied business models.

Their importance is dependent on the characteristics of the entity and the market which the enterprise operates on. Not all of them, and not with the same intensity, can be found in each situation. However, it is indisputable that their proper combination significantly contributes to a higher level of productivity and effectiveness, which, in the long term, are reflected in the business position of the enterprise.

Expert self-assessment – current state of affairs [B_4]

In order to determine improvement areas, it is necessary to assess the level of abilities – internalized by enterprises – to configure a market niche-oriented business model. Apart from the assessment of the required level of assimilation of the specified abilities – in the next stage of the research [B_4] – the degree of capabilities that are at the disposal of the enterprise was assessed (table 1).

Table 1. Ability to profile a business model – current level

Item	Ability to profile a business model	Desired level	Current level	Gap
Z1	Use of modern technological solutions	4.94	4.42	0.52
Z2	Company's financial resources	4.94	4.26	0.68
Z3	Recognition of customer needs	4.87	4.46	0.41
Z4	Possibility to make instrumentation	4.87	4.52	0.35
Z5	Having a network of suppliers	4.86	4.86	-
Z6	Implementation of lean management culture principles	4.86	4.26	0.60
Z7	Accessibility to a proprietary office and team of technologists	4.84	4.20	0.64
Z8	Company's ability to cooperate with other entities	4.72	4.77	- 0.05
Z9	Ability to be the leader	4.58	4.55	0.03
Z10	Intuition and sense of the managerial staff	4.52	4.35	0.17
Z11	Creativity of employees	4.51	4.41	0.10

Source: Authors' own study on the basis of the research [B_3] and [B_4].

From among eleven abilities to profile a market niche-oriented business model, the asked experts evaluate company's funds as relatively most critical in the light of the requirements (average self-assessment 4.26; 46.4% of the indications for 5-point score) and the availability of a proprietary office and team of technologists (average self-assessment 4.20; 43.5% of the indications for 5 point score). In the two cases the difference between the desired and the actual state did not exceed 0.6 point.

In the case of the ability to implement lean management principles (average self-assessment 4.26; 53.6% of the indications for 5-point score) and the application of modern technological solutions (average self-assessment 4.42; 52.2% of the indications for 5 point score) this gap is relatively high; the difference between the desired and the actual state exceeded 0.5 point.

The experts relatively highly assess their enterprises in the context of their ability to recognize customer needs (average self-assessment 4.46; 53.6% of the indications for 5

point score) and possibilities of producing instrumentation using their own production resources (average self-assessment 4.52; 59.4% of the indications for 5 point score); the difference between the desired and the actual state oscillates below 0.5 point.

The owners and executive employees and managers employed in the companies represent a very high level. The ability to be the leader (average self-assessment 4.55; 66.7% of the indications for 5-point score)[15] as well as intuition and sense of the managerial staff (average self-assessment 4.35; 60.9% of the indications for 5 point score) have been assessed relatively highly. Creativity of employees is significantly stressed (average self-assessment 4.41; 60.9% of the indications for 5-point score). In those two cases the difference between the desired and the actual state oscillates below 0.2 point.

In the case of the network of suppliers, held by the examined companies (average self-assessment 4.86; 87.0% of the indications for 5-point score), in the opinion of the respondents the required and the actual level of this ability are convergent.

The negative value in the case of the company's ability to cooperate with other entities (average self-assessment 4.77; 79.7% of the indications for 5-point score) means that experts assess the required degree of this ability lower than that actually possessed by the enterprise.

Conclusions

The basic message of this work is an attempt to subordinate the improvement process to the desired abilities, and strictly speaking, the gap which should be reduced or entirely eliminated.

It is necessary to consider the individual needs of the given enterprise. The research described in this work has aimed to examine the present and the anticipated level of the ability to profile a business model focused on market niches. The material collected in the research procedure has made it possible to formulate counter-proposals of general and cognitive nature; provided that the authors allow conclusions and recommendations to be referred solely to manufacturing companies operating in the Polish agricultural machinery sector.

Notwithstanding the above, in the paper attempts have been made to present universal procedures and tools ensuring identification of key abilities to profile market niche-oriented business models; the authors hope that this will contribute – at least to a minimum degree – to partial filling of the gap in this regard.

The issues presented in the study require further, even more in-depth research. The problems raised in particular chapters can be the subject of separate studies. It was im-

[15] The difference between the desired and the actual state amounts to 0.03 point.

possible to provide a comprehensive solution to all the issues related to the discussed subject matter in one short study. The research presented in the text should be treated as guidelines, on which further works will be carried out, especially as there is a need for new methods of management rationalisation.

It is advisable to conduct further research on the determinants of the development of business models and the criteria for shaping their reconfiguration potential. It is necessary to try to plan a concept of the expert system that add dynamics to the business model composition and to develop a method for assessing the impact of the selected competencies on the ability and direction of its profiling. In subsequent research of the authors' team under the leadership of B. Nogalski, heterogeneous components (dynamic competencies), which imply a specific business model, will be compiled.

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Characteristics of Business Models of Creative Company

Abstract: Business models keep evolving and changing all the time and from time to time fresh ones appear. Currently, a new model has been noticed i.e. creative companies [Dziurski 2016]. They are the effect of the development of innovative economy, which is inspired by knowledge based on non-material resources which still have measurable financial value [Radomska 2017].

The aim of this article is the identification of the features of creative companies on the basis of four distinguished business models of creative companies.

The analysis was divided into two parts – theoretical and practical. The first part describes the reason why the issue of the creative sector and business models was chosen. It also characterizes the creative sector and presents the definition of the creative sector and creative companies, as well as describes the essence of the business models and types of business models in creative industries. The practical part of the article aims at presenting studies of companies regarded as creative and presenting the types of business models of the creative industry.

Key words: creative company, creative sector, business model

Introduction

The element which connects all the sectors is creativity. It is admittedly present in all human activities, however, only in some part of cases its contribution into the effects of a man's work, which is intellectual property, is majoritarian [Howkins 2005].

The 21st century is a time when the role of creative sectors in economy has grown significantly – to the extent that more and more often we can read in reports and analyses focusing on economic development in individual countries and continents that it is the

creative sector that offers the most jobs. Thus, a conclusion is suggested that the growth of this sector is particularly important from the point of view of economic development [Kotylak 2017].

Within the scope of each sector there are companies which offer given goods and services. The creative sector is created by a group of companies which generates both tangible as well as intangible products or artistic services, which are composed of creative content, economic value and marketing purposes. Those companies due to the specific character of their activity are often called creative companies. Which activities are considered creative is mainly dependent on arbitrary decisions of scientists or public authorities interested in the development of the creative sector [Młyńska 2015] that is why it seems crucial to make an attempt to classify what a creative company is and if the recent business model is in fact something new.

Theoretical Background

The idea of creative industry was created by the government of Great Britain at the end of 1990's. There was a need to combine cultural and commercial activity. It was supposed to make cultural activity become present on the market and under the influence of the market's forces. It coincided with computer science revolution. According to scientists it had impact on changes in the area of creation, production, re-production, distribution, commercialization and the consumption of products as well as services offered by organizations operating in the areas [see Coblence, Normandin, Poisson-de Haro 2014; Moyon, Lecocq 2013]. In addition, new types of products and services were created [Evens 2010; Moyon, Lecocq 2013], the number of intermediaries went down but their strength increased [Searle 2011].

The Creative Sector

In subject literature and in accessible research we can come across many various definitions and classifications of the creative sector. Sometimes the classification of the *British Department for Culture, Media and Sport* (DCMS) is adopted, which includes the following activities in the creative sector: advertising, architecture, art and antiques computer games, handicratf, designing, film and video, fashion design, music, performative arts, publishing, software, radio and television [DCMS 2009].

Other analyses accept the proposition of *Kern European Affairs* (KEA), which suggests dividing the creative sector into three areas: traditional arts, cultural activity and creative

activity. Each of those covers sectors which have direct connection with creating, producing, distributing and promulgating creative goods and services [KEA 2009]. Some other research sees the creative sector from the perspective of the generated and distributed laws of intellectual property.

However, the most general definition of the creative sector was proposed by the subsidiary institution of the United Nations Organisation – *United Nations Conference on Trade and Development* (UNCTAD): the creative sector are the cycles of creation, production and distribution of goods and services that use creativity and intellectual capital as primary inputs [UNCTAD 2008].

Creative industries are a holistic concept which changes the way of thinking about art, media and design by combining them with digitization, creativity and intellectual capital [Howkins 2001]. In the definitions of creative industries the combination of culture and market is often emphasized [see e.g. Caves 2001], where both economic as well as non-economic values are designed, produced and distributed [see e.g. Throsby 2010]. The term "creative industries" joins many different economic activities which initially seem unrelated, such as [Flew, Cunningham 2010]: sectors in which production and distribution are strongly industrialized (e.g. film, television, publishing, music), sectors highly labour-intensive, including culture and art (e.g. handicraft, design, visual arts), sectors highly commercialized (e.g. marketing and advertising, software).

The Essence of Creative Companies

In order to locate the creative companies in the sphere of economic activity (as entities affected by competition, the neccessity to adjust to changes on the market), they are defined as entities which use artistic and creative skills of their employees or other workers to make profit [ARP 2012].

Młyńska [2015] on the basis of Caves [2003] defines features of creative companies as follows:

1. The activity of creative companies is characterised by exceptionally large uncertainty (*nobody knows*) in terms of demand of the created goods. Anticipating the reaction of consumers to the offered product before introducing it to the market always carries a significant deal of uncertainty, however, in creative companies it is particularly high.

2. Creative products are mostly experience goods [Kotylak 2017]. It is difficult to measure the level of satisfaction or dissatisfaction as it is very subjective.

3. The work performed in creative companies is an art – the aim in itself (*art for art's sake*). The employees-artists decide themselves what work must be done and with

what tools or techniques. Very often, they are ready to work for lower salary as they gain satisfaction from the process of creating itself and work reflects their lifestyle in a way.

4. A collective process of production (creation process) is also an attribute of creative activities. Making a complex creative product sometimes requires participation and cooperation of many people very often with different visions concerning the final shape of the product. An example might be the realization of big creative projects such as for example film production where producers, actors, directors and many other people with key talents need to cooperate.

5. In creative companies the workforce contains of various groups of creative people. Some work in bursts and rely on intuition, others work methodically. Some aim at creating big and ground-breaking things, others focus on small improvements. Some move from job to job, others are comfortable with the safety of a big organization. However, all of them have one common feature i.e. the desire to be in a place where their creativity could be used and their contribution appreciated, and also a place which would have the mechanisms to mobilise resources around an idea [Florida 2010].

6. In an activity where the dominating factor of production is creativity (understood as the effect of human imagination and the ability to generate original ideas), there should be no limits in the way the work is done, thus, in the creative sector it is usually organized in an informal way. A common form of relations/agreements are contracts as opposed to permanent employment [Mackiewicz, Michorowska, Śliwka 2009]. Such an informal organizational structure enables free flow of ideas and open communication among employees, and as a result of their cooperation quick reaction to changes that appear.

7. The essence of the functioning of creative companies is coming up with new ideas which constitute a kind of innovation. An innovation in the activity of creative companies will rather be a new form of expression and new aesthetic values than new or improved products [Mackiewicz Michorowska, Śliwka 2009]. In this sense, innovations might be treated as transformation of an idea into a market product or service – a unique process of production or a new form of services. The success of innovation depends on the conditions and technical abilities of a creative company and the market attractiveness of the offered product [Młyńska 2015].

8. The creative companies are characterised by almost unlimited diversity of creative products which requires polarised skills. This means that the market has a big potential of growth, however its development will not be based on standardisation and lowering production costs, like in traditional industrial sectors, but on increasing

and then fulfilling the cultural needs of consumers, who have different interests and expectations in terms of the final product.

9. In the same way, the creative sector is composed of small one-person companies (writer, painter), as well as large organization (publishing houses, record companies) the activity of creative companies is also characterised by strong connections between the creator and the entrepreneur – sometimes it is one person and sometimes two cooperating parties.

Business Model

The concept of business models is permanently inscribed into teaching about marketing [Jabłoński 2017], and is an inherent element of each business undertaking [Magretta 2002; Teece 2010]. There are numerous interpretations which define the concept [see: Jabłoński, 2014]. The interest in business models is growing among scientists as well as among business practitioners [Falencikowski 2013]. One of the most popular is the definition by Teece, where a business model characterizes the way the company delivers value to the consumer and how it turns fees into profit [Teece 2010].

According to Timmers, a business model is architecture for products, services and the flow of information, including descriptions of various economic entities and their roles together with descriptions of potential profits for different business player and the description of revenue [Timmers 1998].

Due to limited place and the fact that in subject literature there are very detailed reviews of definitions and elements of a business model [see e.g. Falencikowski 2013; Jabłoński 2014], the aim of hereby article is not to present a detailed analysis of business models.

For the purpose of this publication we will adopt the following definition of a business model – it is a concept which describes the logic of creating and capturing value for the benefit of a company and delivering it to the consumer [Falencikowski 2013; Coblence et al. 2014; Moyon, Lecocq 2013; Zott, Amit, Massa 2011].

Types of business models in creative industries

The classification of business models in creative industries used in this article and developed by Dziurski [2016] was created on the basis of a pattern of a model proposed by M.W. Johnson, C.M. Christensen and H. Kagermann [2009] and the typology of creative industries suggested by the British organization called NESTA (*National Endowment for Science, Technology and the Arts*) [2006].

Table 1. Types of business models in creative industries

Creative service providers			
Value for the consumer	Profit formula*	Key resources	Key processes
Rendering services protected by copyright law, author's work (B2B segment)	Revenue: fee for rendering services Costs: rendering services	Knowledge and skills; relations; reputation; strong brand; efficient management system	Creating and designing; selling
examples: advertising agencies, architecture studios, design workshops			
Creative content producers			
Value for the consumer	Profit formula*	Key resources	Key processes
Producing content which are delivered to wide public (B2C segment)	Revenue: selling content, advertising, granting licence, Costs: producing content, marketing	Financial resources; machines and devices; knowledge and skills; relations; reputation; strong brand; efficient management system	Creating and designing; production; marketing
Examples: film producers, music producers, software publishers, computer games producers			
Creative experience providers			
Value for the consumer	Profit formula*	Key resources	Key processes
Offering products / services which take the form of experiences (B2C segment)	Revenue: fee for using, advertising Costs: preparing products / services, marketing	Financial resources; knowledge and skills; relations; reputation; strong brand; efficient management system	Creating and designing; production; organization; events; marketing
Examples: theatre producers, concert and festival organizers			
Creative originals producers			
Value for the consumer	Profit formula*	Key resources	Key processes
Creating goods with unique character (B2C segment)	Revenue: selling Costs: fixed costs, making products	Machines and devices; knowledge and skills; reputation; strong brand;	Creating and designing; production; selling
Examples: handicraft makers, fashion designers			

Source: [Dziurski 2016].

Business Model – a Creative Company

Research Methodology

In order to verify the hypothesis that the business model of a creative company has some particular characteristics the author decided to gather data by conducting deepened interviews and observation, analysis of documents and reports as well as interviews with employees in 12 companies and 53 students of the Strzemiński School of Art. The exploration was conducted between the years of 2017–2018 in Łódź region.

The aim of the analysis was to answer the question what features identified business models of creative companies. In order to obtain empirical conclusions from the data,

a thorough and multifaceted analysis was used, which gave the chance to obtain a possibly accurate and multifaceted picture of cases of a given phenomenon. The choice of method resulted from the initial stage of the research, the unique phenomenon of an creator-entrepreneur, as well as the will to make the analysis wide enough and the issue to be understood better.

The criteria for selecting the sample

12 companies that participated in the study are small organizations employing up to 50 people, operating in the Lodz region which, from the point of view of UNCTAD classification belong to the creative sector. Selection for the trial was deliberate and stemmed from the type of business activities of companies which are active participants of the creative sector. The choice of those companies was dictated by the initial stage of the research and the need for a thorough analysis and better understanding of the phenomenon itself. Types of activity which were analysed were: exhibition space designing, audio -visual design of concerts (VJ), graphic designer, advertising agency, design workshop, film producers, theatre and film costumes designing, scenography, concert organizing, fashion designing, creative agency, which aims at complex service for customers in the fashion industry, jewellery designing, visual communication designing, bicycle desiging.

This analysis was supplemented with deepened interviews with students of the Strzemiński School of Art from the faculty of Textile and Fashion Design (35 students), as well as Industrial Design Faculty (18 students). The selection of students for the trial was deliberate – those who are active participants of the creative sector were chosen.

Results

The research conducted indicates that the analysed companies and creators characterize with the following features:

1. The activity of the analysed creative companies, as in the theoretical model, is characterised with exceptionally high uncertainty (*nobody knows*) concerning the demand for the produced goods. The respondents said that when introducing new products onto the market, despite detailed market analysis, they did not know what the reaction of the consumers would be to the offered product. The example here might be Many Mornings – a company producing socks where one sock of the same pair is different than the other while still being a match.

2. According to the respondents products produced by them (creative products) are mostly experience goods – an example here might be visual effects at a concert

or a stylist's activity. The satisfaction connected with them is subjective and is hard to measure.

3. The research conducted indicates that, in compliance with the theoretical model proposed by Młyńska [2015], that the work done in creative companies is art – the aim in itself (*art for art's sake*). Worker-artists have enough knowledge and experience to decide themselves how to do the work and what tools or techniques must be used. However, the same research suggests that they are not willing to work for lower salary, as the theoretical model by Młyńska [2015] indicated, because they are aware of the uniqueness of their work and the price it should be sold for. Still, they get satisfaction from creating. Work is very often their lifestyle.

4. The results of the research suggest that the attribute of the activity of creative companies is also the collective process of creation. Artists – designers while creating a complex creative product work in very large diversified teams, where members often have different competencies and knowledge as well as various visions in terms of the final shape of the product. The example here might be realization of work in "Pan tu nie stał" company.

5. In creative companies, according to the results of the research, workforce is composed of various groups of creative people. Some move from job to job, some prefer the security of a large organizations and the stability of employment. Some create small improvements, others huge projects. What is characteristic for them is that they care about mobilizing resources around an idea, appreciating their input and the possibility to use creativity. This way they create new things.

6. The research indicates that people who work in companies where products which are the effect of human imagination together with the ability to generate original ideas are created are on the one hand employed permanently in different organizations such as fine art academies or other companies, which gives them the feeling of stabilisation, on the other hand they also work as freelancers, as it motivates them additionally to work and makes them even more creative. What is more, those companies have low level of formalisation and they are characterised by team organizational structure, which enables free flow of ideas and open communication between employees and as a result of their cooperation – quick reaction to changes.

7. According to respondents in the analysed creative companies the basis of their functioning is creating new ideas. Those innovations have the character of new forms of expressions and new aesthetic values and not only new or improved products. In this sense innovations can be treated as transformation of an idea into a market product or service, a unique process of creation or a new form of services. The success of an innovation depends on conditions and technical possibilities of a creative company and the market attractiveness of the offered product.

8. The analysed creative companies characterised with very different products from audio-visual effects at a concert, through documentary photographs, to advertising campaign or an educational film. The creative sector has almost unlimited variety of products which requires polarised skills. In the analysed companies the pressure is put on uniqueness, individual adjustment of a product to the customer's needs, fulfilling their cultural and aesthetic needs. The analysed creative companies do not care about standardisation and lowering of costs of production – which is normal for traditional sectors – they care about increasing quality and added values of a product.

9. The analysed creative companies differed in terms of size – from one-person companies (photographer, graphic designer), through small and medium (advertising agency, company producing socks) as well as large organizations (clothing companies bicycle producer). The activity of the analysed creative companies is connected with strong bond between the creator and the entrepreneur who can be combined in one person or be two cooperating parties.

Discussion

On the basis the conducted research, the features of creative companies were identified on and four business models of creative companies were distinguished.

Table 2. Business Models Analysed in Creative Industries

	Creative service providers	**Creative content producers**	**Creative experience providers**	**Creative originals producers**
Innovativeness of the business model:	intellectual input, using artistic skills and knowledge, aesthetics, non-material values of the product.	intellectual input, knowing the trends in aft, work is art – the aim in itself (art for art's sake), aesthetics, non-material values, effect of work of a large diversified creative team.	intellectual input, using artistic skills and knowledge, aesthetics, non-material values, customer satisfaction is subjective, the idea is the product which is supposed to appeal to the customer.	added value in the form of original design, limited amount production, aesthetic input, art as a product, effect of work of a large diversified creative team, customer satisfaction is subjective.

Analysed company or the creator:	advertising agency, design workshop, visual identification studio, exhibition space designer, designing visual communication.	film producers, graphic designer, film costumes designing	theatre producers, theatre costumes designing, scenography, Audio-visual effects for concerts designer (VJ), concert and festival organizers	handicraft makers, fashion designers, bicycle producer, creative agency, which aims at complex service for customers in the fashion industry, jewellery designers

Source: personal research.

Conclusions

For some time in the academic circles there has been a discussion whether we can talk about creative sector and what makes it special in comparison with other sectors in economy. The hereby article presents differences which make the sector an individual part of the market the conducted research offered the possibility to identify the features of creative companies on the basis of which 4 models of creative companies were presented here.

The research conducted and the literature analysis suggest that a creative company is in fact a new business model. It is indeed based on innovations like other business models presented in the subject literature, however, their character is significantly different from the ones that appeared earlier as these are new forms of expression and new aesthetic values and not new or improved products.

Innovation is an added value – first of all these are non-material profits for the user – it is art for art's sake.

The article is a motivation for further research in the field. The author's assumption is to create full research which will present how creative companies function in a wide market spectrum.

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The Role of Initial Evaluation of Suppliers in Building Partner Relations

Abstract: The aim of the article is to present the role of the initial evaluation by enterprises of suppliers in building partner relations. This evaluation is perceived by many economic entities as one of the key stages of the sourcing process on the B2B market. The conducted analysis of the letter indicates that the initial evaluation of suppliers allows the significant reduction of the level of risk, especially in the case of new contractors. The results of empirical research indicate that companies operating in Poland wanting to shape partner relations with suppliers conduct their initial evaluation focused mainly on ensuring timely delivery, favorable pricing conditions, guaranteeing the technical quality of the product (meeting the required specifications), as well as the scope of guarantee obligations.
Key words: initial evaluation of suppliers, building partner relations, supply chain management, requirements for suppliers, supplier development programs

Introduction

Institutional clients (especially manufacturers) are increasingly focusing on the selection of key suppliers, shaping long-term relationships with them thereby ensuring the technical quality of product solutions (conducting joint research and development), reliability of supply based on both flexibility and shortening cycle orders [Ekici 2013]. Shaping relations with suppliers in the purchasing process can be summarized in four phases. These are [Moschuris 2008, pp. 143–153]:

- Defining requirements – in relation to the sources of purchase, in their technical quality and service, the size and frequency of orders, supplier's potential and financial conditions;

- Selection of a supplier that precedes the identification of potential suppliers, the qualification of the supplier and the negotiation of conditions;
- Order fulfillment (including order transfer, delivery monitoring and documentation of the purchasing process);
- Evaluation of the cooperation in and development of partner relationships.

In the process of building long-term cooperation with suppliers, their initial evaluation is of particular importance. The main criteria for this evaluation focus mainly on the three most important parameters, which are quality, price, and timeliness [Kildow 2011].

The result of this evaluation allows one to qualify potential suppliers, thereby determining their status. Most often, as a result of this evaluation, suppliers are divided into:

- Preferred suppliers, characterized by their stable financial position and leading position in the field of technical solutions, quality and timeliness of deliveries as well as price competitiveness;
- Active suppliers, those which meet the requirements (with the potential to become preferred suppliers);
- Restricted suppliers on hold, these are subject to reservations due to their having problems with maintaining technical quality and timeliness of deliveries. Contracts are maintained, although the volume of purchase transactions is gradually reduced, and they are not included in new projects;
- Disqualified suppliers that do not meet the minimum requirements [Monczka, Handfield, Giunipero, Patterson, Waters 2009].

The essence of the initial evaluation of suppliers

The initial evaluation of suppliers is perceived by many businesses as one of the key stages of process sourcing and building relationships between clients and providers. The evaluation significantly limits the level of risk, especially in the case of new contractors. An analysis of the literature indicates that more and more companies, especially multinationals looking for local sources of supply, are not only focused on the submitted price offer of the supplier [Żak 2015; Govindan, Rajendran, Sarkis, Murugesan 2015; Awasthi, Govindan, Gold 2018]. The range of evaluation fields for businesses to use allows them to collect as much data as possible to achieve the level of product quality expected (e.g. trial of goods / free use of goods), processes (through audit) or evaluation of the legal and economic situation (through due diligence). The results of the literature analysis indicate that the following criteria are also considered valuable for initial supplier evaluation: technical and R & D potential (implemented technologies, infrastructure, new and improved products), human resources (staff preparation level), economic (financial results

achieved, sources for financing activities), management ability to ensure the desired level of technical quality (especially product safety for both the environment and users), as well as the scope of activity (territorial scope of operations, supported segments). Such criteria are applied, in particular, by companies with an international operating range who wish to further reduce the risk associated with contacts with potential suppliers [Singh 2014; Imeril, Shahzad, Takala, Liu, Sillanpää, Ali 2015; Trautrims, MacCarthy, Okade 2017]. As already mentioned, due to the desire to shape long-term partnerships between business partners, the legal and financial situation is also important when assessing suppliers. Due diligence is the assessment of: legal structure and ownership participation (legal titles to tangible and intangible assets), performance of obligations (financial / material / intangible assets, indebtedness, profitability, financial liquidity, shares in other enterprises, type and range of insurance and financial guarantees) that may determine the stability and sustainability of these relationships in the future. It may also be noted that many supply-side bidders, wanting to reduce the level of uncertainty of buyers, also offer them so-called reference visits to their premises or branches.

Criteria for the initial evaluation of suppliers

Building relationships with suppliers is a process in which the requirements set for them play a significant role. These requirements are verified by initial and periodic evaluation. A literature analysis shows that the evaluation criteria are usually focused on ensuring the required level of technical quality (supported by product certificates), efficiency and supplier's potential (flexibility of timeliness and supply, production capacity, the range of offered products, implementation of product innovations), price competitiveness, provision of pre-sales maintenance services (solution design, technical consulting), after-sales maintenance services (delivery, installation, technical service, and maintenance) and information service (training and consulting). Meeting these requirements is a prerequisite for achieving the status of a qualified supplier and building partner relationships based on mutual trust [Yan, Yang, Dooley 2017]. Technical quality is of particular importance as a criterion of the periodical evaluation of suppliers, which is usually measured by the level of defective deliveries (the percentage of the defective delivered pieces of products compared to the total number of delivered volume). In the case of mass products, it is measured by the Defective Parts Per Million index. In the case of certain sectors (e.g. automotive), the permissible value of this indicator is set, if it is exceeded, may lead to the elimination of the supplier from further cooperation. The technical quality assessment may also concern (especially in the case of unit purchases, such as technical infrastructure elements) the assessment of the product's ability to perform utility functions, reliability,

innovation of solutions, safety, exploitation, universality of applications and ergonomics. It is carried out during the operation of the product, and its result determines further orders of infrastructure elements (such as devices or transport vehicles). Pricing conditions are often assessed not only in terms of the costs of the purchase itself, but also for other additional costs incurred by the buyer during the transaction (e.g. delivery, insurance), costs related to operation, as well as costs related to non-compliance e.g. complaints and losses related to taking advantage of the purchased goods [Visani, Barbieri, Di Lascio, Raffoni, Vigo 2016]. Availing of this criterion for periodic evaluation of the supplier, customers may have a better comparison of prices in relation to the competition. It can also be noted that many companies are sometimes willing to accept higher prices provided they are justified by the supplier (e.g. a sharp increase in the prices of raw materials, energy, currencies, taxes, duties, or other fees regulated by the state). Timeliness of deliveries is a particularly important criterion for the initial evaluation of suppliers in the case of enterprises operating in the Just in Time concept. Buyers' expectations on the B2B market in the initial evaluation of suppliers focus not only on ensuring product safety but also on ensuring the operational processes operational safety, such as communication with the customer, design, purchasing, production and delivery of material, products and services. For this reason, organizations that are buyers in supply chains very often require their suppliers to implement Quality Management System (QMS) requirements contained in the ISO 9001 standard. The latest amendment to this document, carried out in 2015, was based on the risk management concept, which, if included in the implementation of systemic quality management, should effectively ensure the safety of material products and services, as well as related processes (operational processes). It should be noted that in some sectors the requirements placed on suppliers in the field of quality management do not only concern compliance with the guidelines contained in the ISO 9001 standard. They are also extended by additional requirements contained in relevant documents (specifications, standards) such as the automotive sector (ISO/TS, IATF 16949, VDA series 6), the aviation sector (AS/EN /JISQ 9100), the rail industry sector (IRIS), the medical devices sector (ISO 13485), the direct packaging materials sector of medicinal products (ISO 15378), the cosmetics production sector (ISO 22716), the packaging industry for food products (EN 15593) and the sector of fusion welding of metallic materials (ISO 3834). The wide-spread implementation of the concept of sustainable and sustainable development by large international industrial concerns means that an increasing group of these enterprises requires suppliers to implement systemic environmental management [Motevali Haghighi, Torabi, Ghasemi 2016; Banaeian, Mobli, Fahimnia, Nielsen, Omid 2018]. These international concerns, focus their suppliers' minds on the scope of limiting the negative impact on the environment of their processes and products, often based on the guidelines contained in the ISO series 14000 standards. Particular emphasis on the

implementation by suppliers of requirements related to environmental management is related to compliance with legal provisions, in particular directives and EU regulations, such as:

- RoHS (Restriction of Hazardous Substances) Directive EU 2003/95/EC,
- WEEE (Waste Electrical and Electronic Equipment) Directive 2001/96/EC,
- EuP (Eco-design for Energy using Products) Directive 2009/125/EC,
- Battery and Accumulator Directive 2006/66/EC,
- Packaging Directives 94/62/EC, 2004/12/EC, COM Decision 97/129/EC,
- REACH (Registration Evaluation Authorization and Restriction of Chemicals) Regulation 1907/2006/EC.

The requirements in these guidelines often also concern those companies that are customers from outside the European Union, especially large international automotive concerns (such as Ford, Toyota, Mazda, Nissan, Hyundai, Kia) and companies that produce high-end products (such as Dell, HP, IBM, Motorola, Fujitsu, NEC, Panasonic, Sony, or Toshiba). Analysing global trends, it can be noticed that more and more international manufacturing companies declare that their strategy is based on the concept of sustainable development, which therefore often requires their suppliers (during initial evaluation) to implement an environmental management system (EMS) based on the requirements of the ISO 14001 standard [Ferrón-Vílchez 2016; Winter, Lasch 2016; Luthra, Govindan, Kannan, Mangla, Garg 2017].

The results of empirical research

Activities undertaken by enterprises in the initial qualification of suppliers were the subject of empirical research carried out between October and November 2017, through the use of the Computer Assisted Telephone Interview (CATI) technique. The research covered 300 producers that were suppliers for enterprises from the automotive, metal and chemical sectors. The selection criteria have been assigned a score on a scale from 5 (the most important criterion) to 1 (least significant). The study was commissioned to a specialized research agency, which then made a targeted selection of companies registered in the Kompass database, a search platform of business directories.

The results of the conducted research show that when making the initial supplier selection, enterprises are guided mainly by such criteria as: delivery times, favorable pricing conditions, the technical quality of the product (meeting the required specifications), as well as the scope of warranty obligations. The supplier's production capacity, implementation of the quality management system (QMS), the scope of after-sales services (product installation, technical consulting), the financial state of the supplier as

well as the modernity of product solutions are also important criteria for the selection of business entities that are the source of supply. Whereas, the least important were: references / recommendations, the range of offered products and implementation of an environmental management system. Detailed results of the research are presented in the tables below:

Table 1. The importance of the suppliers' initial evaluation criteria (general results and a comparison between the segments depending on the capital, rank correlations)

Criteria	General N=300	Capital	
		Polish N=120	Foreign N=180
Delivery times	4.006667	4.216667	3.866667
Favorable price conditions	3.906667	4.025000	3.827778
Technical quality of the product	3.633333	3.875000	3.472222
Scope of guarantee obligations	3.546667	3.608333	3.505556
Supplier's production capacity	3.486667	3.550000	3.444444
Implementation of the QMS	3.463333	3.641667	3.344444
Range of after-sales services	3.453333	3.558333	3.383333
Financial condition of the supplier	3.263333	3.283333	3.250000
Modern product solutions	3.256667	3.350000	3.194444
Possessed references / recommendations	3.106667	3.175000	3.061111
Implementation of the EMS	3.000000	2.916667	3.055556

Source: results of empirical study, 2017.

Table 2. The importance of the suppliers' initial evaluation criteria (comparison between the segments depending on the number of employees, rank correlations)

Criteria	Number of employees	
	-250 N=223	251- N=77
Delivery times	3.982063	4.077922
Favorable price conditions	3.937220	3.818182
Technical quality of the product	3.609865	3.701299
Scope of guarantee obligations	3.529148	3.597403
Supplier's production capacity	3.439462	3.623377
Implementation of the QMS	3.426009	3.571429
Range of after-sales services	3.452915	3.454545
Financial condition of the supplier	3.233184	3.350649

Modern product solutions	3.206278	3.402597
Possessed references / recommendations	3.107623	3.103896
Implementation of the EMS	2.941704	3.168831

Source: Results of empirical study, 2017.

Analyzing the detailed research results and differences between the individual segments, it can be noticed that the declared timeliness of deliveries is of particular importance for enterprises with Polish capital and large producers from the metal and chemical sectors. In turn, favorable price conditions are particularly important for small and medium-sized business entities with domestic capital as well as for producers of metal and chemical products. The technical quality of the product is particularly important for large enterprises with Polish capital and for companies from the automotive and chemical sectors. For the same segments of companies, the scope of warranty obligations, production capacity and the implementation of the quality management system are also important. The implementation of the environmental management system is of great importance for business entities with foreign capital operating in the automotive sector.

Table 3. The importance of the suppliers' initial evaluation criteria (comparison between the segments depending on the sector, rank correlations)

Criteria	Sectors		
	Automotive N=99	Metal N=104	Chemical N=97
Delivery times	3.878788	4.057692	4.082474
Favorable price conditions	3.787879	3.903846	4.030928
Technical quality of the product	3.636364	3.346154	3.938144
Scope of guarantee obligations	3.585859	3.346154	3.721649
Supplier's production capacity	3.545455	3.298077	3.628866
Implementation of the QMS	3.494949	3.288462	3.618557
Range of after-sales services	3.515152	3.500000	3.340206
Financial condition of the supplier	3.282828	3.201923	3.309278
Modern product solutions	3.424242	3.192308	3.154639
Possessed references / recommendations	2.969697	2.942308	3.422680
Implementation of the EMS	3.323232	2.913462	2.762887

Source: Results of empirical study, 2017.

The results of the conducted research indicate that the most important activities related to the evaluation of the supplier pre-purchase are: testing the product batch, analysis of offers (including product, timeliness and price terms), supplier audits and product certificates held. However, opinions concerning the product on the internet, system certificates, due diligence assessment, as well as reference visits (at current supplier's customers) are less important. Detailed results of the research are presented in the tables below:

Table 4. The importance of activities related to the evaluation of the supplier before buying (general results and a comparison between the segments depending on capital, rank correlations)

Criteria	General N=300	Capital	
		Polish N=120	Foreign N=180
Testing the product batch	4.006667	4.125000	3.927778
Offer analysis	3.643333	3.750000	3.572222
Audit of supplier	3.510000	3.500000	3.516667
Product certificates	3.436667	3.491667	3.400000
Reviews from the internet about the product	3.300000	3.500000	3.166667
System certificates	3.173333	3.341667	3.061111
Due diligence	3.143333	3.058333	3.200000
Reference visits	2.886667	2.758333	2.972222

Source: Results of empirical study, 2017

Table 5. The importance of activities related to the evaluation of the supplier before buying (comparison between the segments depending on the number of employees, rank correlations)

Criteria	Number of employees	
	-250 N=223	251- N=77
Testing the product batch	3.955157	4.155844
Offer analysis	3.582960	3.818182
Audit of supplier	3.439462	3.714286
Product certificates	3.390135	3.571429
Reviews from the internet about the product	3.300448	3.298701
System certificates	3.147982	3.246753
Due diligence	3.112108	3.233766
Reference visits	2.852018	2.987013

 Source: Results of empirical study, 2017.

Table 6. The importance of activities related to the evaluation of the supplier before buying (comparison between the segments depending on the sector, rank correlations)

Criteria	Sectors		
	Automotive N=99	Metal N=104	Chemical N=97
Testing the product batch	3.898990	3.942308	4.185567
Offer analysis	3.646465	3.442308	3.855670
Audit of supplier	3.636364	3.288462	3.618557
Product certificates	3.393939	3.269231	3.659794
Reviews from the internet about the product	3.333333	3.134615	3.443299
System certificates	3.343434	2.971154	3.216495
Due diligence	3.333333	2.971154	3.134021
Reference visits	2.989899	2.932692	2.731959

Source: Results of empirical study, 2017.

Analyzing the detailed research results and the differences between particular analyzed segments, it can be noticed that testing the batch and analysis of bids are very important for large enterprises with Polish capital and producers of chemical products. In turn, carrying out audits and the holding of product certificates by suppliers is of particular importance for large manufacturers from the automotive and chemical sectors. Assessment of the economic and legal situation and reference visits are important for large enterprises with foreign capital, as well as for the automotive and chemical sectors.

Forms of support for suppliers

For many companies, relationships with suppliers are not limited to rigorous requirements [Glock, Grosse, Ries 2017]. Increasingly, they are recognizing that building their competitive advantage also requires building partnerships with suppliers that are manifested in joint projects in the field of both product innovation (improvement of current technical parameters and implementation of completely new products) and organizational ones contributing to efficiency growth (reducing the risk of lack of timeliness, delivery defects), as well as the increase in the efficiency of processes (reducing costs by increasing employee / infrastructure performance, improving safety, or limiting the negative impact on the environment). When undertaking activities aimed at improving processes and products, many entities also include their suppliers in this activity (the implementation of process and product improvement tools) by offering them special sup-

port programs based on win-win principles [Omurca 2013]. These programs are implemented through joint projects aimed at introducing new or improving existing products [Chavhan, Mahajan, Sarang 2012]. They may also focus on activities aimed at ensuring and improving the quality of products or on ensuring and improving the quality of processes [Li, Chow, Choi, Chan 2016]. These programs may also be focused on providing basic or specialist support in the area of product improvement and operational processes. Effective implementation of these programs allows both suppliers and recipients to improve the quality of products (reduce the level of non-compliance, introduce product innovations, increase the level of reliability and safety), shorten the cycles of processes and reduce their costs [Fu, Zhu, Sarkis 2012]. To ensure the effectiveness of the supplier development program, it is necessary to create a climate of cooperation based on mutual commitment, trust and open information exchange, especially in the area of quality results (ability to meet the requirement level for ensuring and improving products and processes) and cost results.

Conclusions

Recapitulating the theoretical considerations presented in the article as well as the results of empirical research, it can be noticed that effectively-conducted preliminary assessment of suppliers is a decisive element for enterprises when initiating partner relations. It often gives the opportunity to thoroughly verify the readiness of the future contractor to meet expectations which are often very tight, not only to guarantee the technical quality of purchased products, but also organizational standards (based on international standards in quality management, environment and safety), and the opportunity to improve operational processes which can guarantee a high level of timeliness and flexibility of deliveries as part of future cooperation.

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Open Sources of Innovation and its Influence on Firms Innovativeness[1]

Abstract: Innovation is one of the key sources of achieving competitiveness. This paper discusses open innovation sources and their influence on innovativeness of SMEs. The main aim of an article is to determine the relationship between open sources of innovation and innovativeness in SMEs. The specific objectives of the article relate to examine what kind of channels of open sources of innovation are popular in the activity of surveyed SMEs and if the innovation activity brings them new technology solutions and access to new knowledge. The article also empirically examines how the channels of open innovation sources relate positively with innovativeness of firms and which of the channels do not play any role in the performance in gaining a new technology and knowledge solutions. The study is based on a survey on industrial firms located in Poland. The survey has determined the positive relationship between open sources of innovation and innovativeness of research sample. A strong direct effect on innovativeness of surveyed firms have channels like: feedback from suppliers of equipment, materials, components or software and firms' clients, information from the articles, standards, metrology. These findings suggest that measurement of open sources of innovation and its channels should be developed further in order to make them a more relevant concept for empirical studies of SMEs innovativeness.

Key words: open innovation, innovation model, innovativeness, open sources of innovation, small and medium firms

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Introduction

Changing operating conditions forces firms to seek for sources of innovation, new knowledge and technology. The evolution of innovation models over the years has shown its development and adaptation to changing market conditions. Firms innovation activities can include a number of actions in the nature of scientific research, development, marketing or organization leading to development and implementation of new or improved products and processes. According to Porter [1990] and Drew [1997] the only way for a company to gain a sustainable competitive advantage is invariably upgrade its processes and activities through innovation.

Practitioners consider innovation as a tool to improve the avenues of growth available to their firms and use branding to survive the competition they face in the market [Gupta, Malhotra 2013]. Innovations in this area are the result of many, often very complex interactions. Analysis of innovative models indicate that early linear models where the primary source of innovation is the research activity do not correspond to modern needs of small and medium-sized enterprises. In addition, early innovation models are characterized by insufficient use of opportunities of the enterprise environment and the possibilities of cooperation in introducing innovation. Openness to the environment of customers, suppliers, other companies, research institutes or universities within the organization, makes it possible to improve in this field. According to de Jong and Marsili [2006], openness has positive impact on small firms' performance. In contrast to large companies, SMEs are rather lacking in their experience and resources to properly innovate and commercialize their solutions [Lee et al. 2010]. Rahman and Ramos [2010] noticed that SMEs, accordingly to lack of managerial and technical skills, have difficulties in reaching their effectiveness. Only the firms strong enough to have sufficient research and development activity, as well as financial sources, are able to innovate in line through these models. Therefore, these ways of acquiring innovativeness are usually beyond the reach of SMEs. Often this type of companies has little financial resources and poor human capital. On the other hand, internal research and development (R&D) activity is usually risky and out of rich of SMEs. In that situation, companies can lean towards the purchase of finished material and already checked technology.

Therefore, to create innovativeness modern enterprises are obliged to use opportunities offered by the complex and iterative network under open innovation models.

Theoretical background

The evolution of innovation models from linear, in which the basic element outputs were studies towards interactive models showed that innovation is not a one-way process caused only by the development of scientific environment, but it is interactive process with a strong element of feedback. According to Rothwell [1994] and his five generations of innovation models it can be observed that innovation models change dynamically from the first simple technology – push and need-pull models. Dynamic models of interactive innovation process including numerous interactions and feedback during the creation and diffusion of innovation become common among innovation activity of firms. They represent innovation, both as a result of the feedback between the possibilities generated by science and technology and the needs generated by the market or manufacture, as well as a rich set of interactions between science, technology and implementing action activities within the company.

In modern innovation processes knowledge becomes more important, both, flowing from outside as well as inside the company. In the mid-90s of the 20th century there has been significant development of knowledge and knowledge management concept. Nonaka and Takeuchi [1995] presented the concept of knowledge management. They have distinguished quiet and formal knowledge, otherwise known as tacit knowledge, which is the basis and often stems from lived experience and is known for its owner. Tacit knowledge is difficult to codify. The second type of knowledge is formal knowledge otherwise known as explicit, which in turn takes the form of documents, instructions, commands, procedures, diagrams, symbols. It is the knowledge which can be written and accessible to a wide audience of stakeholders in both the enterprise and beyond. This knowledge is the amount of information spoken by the people and is easy to pass the environment [Nonaka, Takeushi 1995]. The development of innovation theory points to the further evolution of the innovation process towards more complex models corresponding to reality. The end of the twentieth century was dominated by traditional, closed approach to innovation management (closed innovation model) according to which companies create, develop and commercialize only their ideas, and it is important that an undertaking's competitors are not able to use the ideas and knowledge that have been formed.

Open innovation model has its origin in the practice of innovative international companies, mainly focused in the industry of high technology *(high-tech).* Open innovation model moved also to SMEs. Although the open models use increases among firms, mostly small and medium sized companies are still carrying out innovation activity under closed models [Lichtenthaler 2008]. On the other hand, according to Idrissia et al. [2012] SMEs in general are involved with open innovation models. Opening in the framework of the innovation process can enable SMEs to overcome the problems of small firms and

external commercialization of technology can give basis for their development. Open innovation models give the option of being innovative at a relatively low investment for limited by the size and lack of resources SMEs [Gassmann at el. 2010]. Open innovation models allow encouraging and exploring a wide range of internal and external sources for innovation opportunities [Cohen, Levinthal 1990].

The concept of open innovation highlights aspects of the broader enterprise collaboration with external partners in order to generate and effective implement innovations. Open models are characterized by maximizing the value that comes from a variety of ideas occurring both within the company as well as those coming from outside like from the company's environment [Chesbrough et al. 2006]. The major advantages of the open innovation model is the possibility of reducing the risks associated with the work of R&D and innovation activities uncertain [Chesbrough 2010]. Collaboration of firms ensures distribution of risk on individual entities, as well as enables them to participate in projects and activities which in isolation would not be possible to take.

According to Cohendet and Joly [2001], high costs of innovation activity, the increasing need for interdisciplinary scientific and technical and increasing emphasis on matching research to the needs brought about changes in the relationship also between the area of science and industry. The boundary dividing the area of research laboratories and businesses fades. In the model of open innovation also organizational boundaries between the company and its surroundings are blurred. Technical knowledge in this process is seen as an economic good that is exchanged between the cooperation partners [Chesbrough, Garman 2009]. As part of the open innovation, the companies are looking for ideas, inspiration and technology in the external environment of the organization, make cooperation with external scientific institutions and research centers.

Small and medium-sized enterprises, within the framework of these models, may work with others, so they have an impact on the shape and scope of solutions they want to win for the efficient and competitive operation in an increasingly demanding market. In addition, an important source of innovation in enterprises is knowledge flowing from and within the company (employees, managers) and knowledge acquired from outside customers, suppliers, subcontractors, subcontractors or open source knowledge. The opportunity to be innovative in the modern economy is not only the domain of large companies with their own R&D facilities, but also small and medium-sized enterprises. Innovation can be built on the basis of its own R&D and domestic potential of enterprises, but also it can be generated by using the ready-made or created in cooperation solutions available in outside environment of the firm.

Innovation models make possible transfer of ready-made solutions, R&D, both from research institutes through vertical transfer, as well as with other companies – horizontal transfer [Mansfield 1975, p. 372]. The simplest form of the flow of innovation occurs when

the owner of the technology – donor, transfers it to the business partner – recipient [Ramanathan et al. 2011]. Innovation can also appear in the open innovation model as a result of knowledge transfer through *know-why*, *know-how* to adapt materials or products to meet the specific requirements and needs [Hayami, Ruttan 1985]. Enterprises cope with capturing value from external ideas as they are located outside the organizational boundary [Priem et al. 2012]. Open innovation allows firms to overcome their challenges and boundaries in being innovative [Gassmann at el., 2010]. Open innovation models might entail great benefits for SMEs to compensate their disadvantages connected to their size and often weak financial sources [Petersen et al. 2002]. Open innovation models are as important to SMEs as for large companies in increasing their innovativeness [Spithoven et al. 2013]. To become more innovative, firms need to exposure technology and innovations from external sources under open model of innovations. In line with this the following hypothesis was formulated:

Hypothesis: Open sources of information relate positively to innovativeness of SMEs.

Open innovation models stress the importance of using the broad range of knowledge sources like customers, rivals, academics for enterprise's innovativeness and invention activities [West at el. 2006]. Not all enterprises rely on external sources of innovations. Not for all of them partners are important in gaining the innovativeness. There are substantial variations in the degree to which firms adopt open innovation [Laursen, Salter 2004]. SMEs have to choose between different forms of open innovation concerning its influence on innovativeness and firm performance [Chesbrough, Rosenbloom 2002]. Also, firms can significantly benefit from relationships with their suppliers [Boutellier, Wagner 2002]. Enterprises rarely reach competitive advantage if their activity is based mainly on internal knowledge [Cassiman, Veugelers 2006].

According to Prahalad and Ramaswamy [2000], the cooperation based on dialogue, access, risk reduction, and transparency of information between customers and company influences positively on innovation. According to Glaister and Buckley [1996] External sources and collaboration allow SMEs to gain improved knowledge, give them ability to access new markets and also have positive effect on reducing costs of R&D activity.

Research method

This study examines the impact of open innovation sources on innovativeness of SMEs. To develop a scale for measuring the innovativeness and open sources of innovation through open models including its channels, this study conducted an empirical study using complexity definitions and analysis from Oslo Manual [2005]. The measures identified in the article consisted of items available and missing in the existing literature about open innovation models. After identification the study employed the technique of equation of multiple regression stepwise and formally tested these through hypothesis testing using data collected from 100 industrial enterprises – respondents.

As a measure of innovativeness of SMEs or dependent, variable adopted including standardized values of individual dimensions of innovation companies in terms of implementation of new or significantly improved product, process, marketing and organization methods. Open sources of innovation were defined due to the divisions of its channels: technological knowledge acquired through participation in industry associations and societies, technological knowledge acquired through participation in industry conferences, technological knowledge gained from trade journals, technological knowledge obtained from published information in articles, standards, metrology, technological knowledge acquired through trade fairs and exhibitions, technological knowledge obtained in the framework of feedback from customers, technological knowledge obtained in the framework of feedback from suppliers, technological knowledge obtained in the framework of feedback from employees. A sample consisted of 100 SMEs participating in the study over a six -month period. The data were collected in Poland. The survey adopted a variant of partial studies. The study included stratification of the population before the draw test. This ensured that the special features included in the group of SMEs are represented in the sample and reflect the actual proportions of individuals with the same characteristics in the population. The units of study were managers of the highest level of randomly selected firms. The study lasted in 2015-2016 and was carried out by direct interviews in the territory of Poland.

Data analysis and results

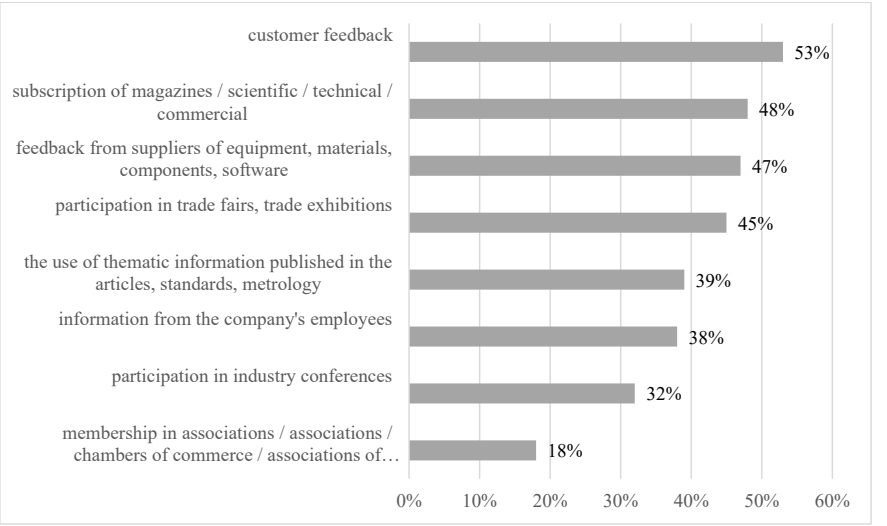
In this survey open sources of innovation are identified as: membership in associations or industry associations, participation in industry conferences, subscription of magazines, scientific, technical, articles, standards, metrology in the field of business,

participation in fairs and exhibitions industry. Open sources of innovations under open model are also: feedback from clients, suppliers of equipment, materials, components or software and as well feedback from employees. Under research questionnaire surveyed SMEs declared if they have used any of defined open sources of information channels and if by activity in declared area there has been a real transfer of new technology or knowledge.

In most parts surveyed companies declared their participation and use of most of the open source innovation channels. As part of the open source of innovations and the existence of a real transfer of new technology or knowledge it was important only to obtain data on actual technological knowledge within the individual channels of open sources of innovation.

For most of the surveyed firms for innovation the feedback from customers was highly important in obtaining information. About 53% of firms declared that feedback from customers was significant for the introduction of new technological knowledge or obtaining knowledge about new developments in the field of production technology. Almost half of the companies (48%) declared access to new technical knowledge or knowledge about new solutions in the field of production technology through the subscription of scientific and technical magazines. In the acquisition of new technological knowledge or knowledge about new solutions, feedback from suppliers of equipment, materials, components and software (for 47% of surveyed firms) and participating in trade fairs and exhibitions (45%) were also important. Every third company declared the use of thematic information, standards and metrology published in the articles. The share of companies that have obtained important information technology amounted to 38% in the case of obtaining it from employees, 32% of companies obtained them through participation in industry conferences, and 18% of enterprises through participation in associations and professional societies (figure 1).

Figure 1. Percentage of channel of open source of innovation (%) important from the point of view of acquiring new knowledge technology

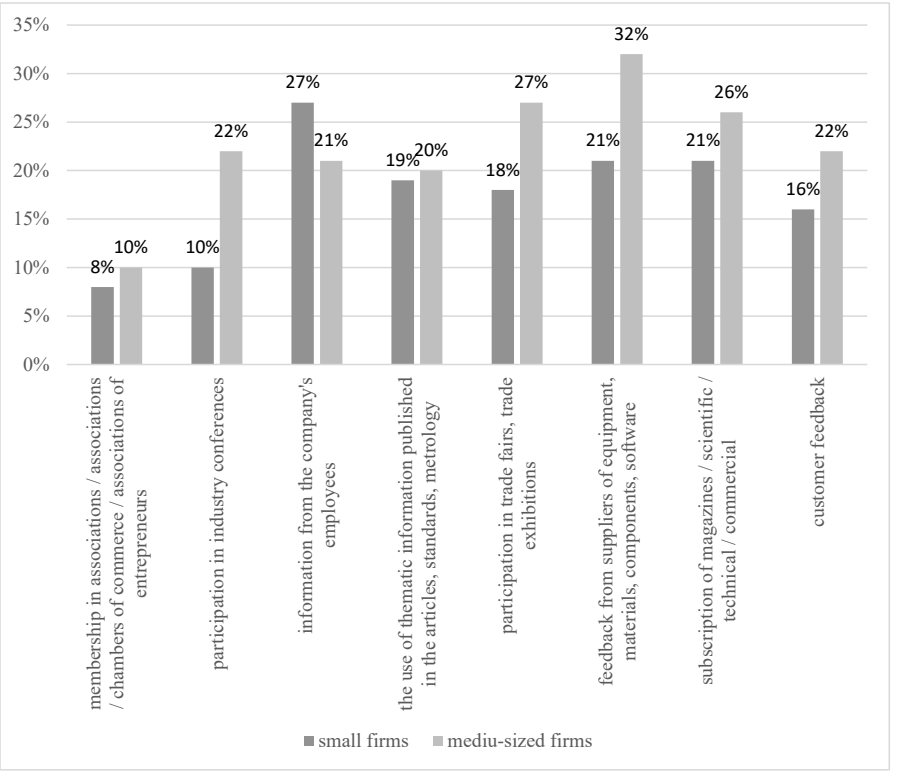


Source: own calculations based on the survey among 100 industrial enterprises from Poland.

Classification of surveyed companies in view of their size indicated that the medium-sized companies were more active in acquiring technology from open sources of innovation than small companies. Only in respect of the acquisition of technological knowledge as a result of subscriptions to magazines were the small companies ahead of average. The share of small companies declaring the acquisition of new technological knowledge within this source amounted to 27% and for medium sized 21%.

Medium-sized enterprises, which have received new technological knowledge with feedback from customers accounted for 32% of all surveyed medium-sized companies, with feedback from suppliers benefited 26% and from the employees 22% of the companies. Medium-sized companies are twice as likely to declare the acquisition of new technological knowledge through participation in industry conferences. The share of companies participating in trade fairs, trade exhibitions and receiving in this way a new technological expertise accounted for small enterprises: 18% and medium-sized enterprises: 27% (figure 2).

Figure 2. Percentage of open innovation sources (%) within the framework important from the point of view of acquiring new knowledge in technological enterprises by size class



Source: own calculations based on the survey among 100 industrial enterprises from Poland.

Further object under the survey was the verification of defined hypothesis and determining whether open source of innovation affects innovativeness of SMEs. In the context of regression analysis factor equation between the amount of innovativeness index and statistically significant explanatory variable (at the significance level of $p < 0.05$) and the coefficient of determination (R^2) in Polish industrial companies were defined. The revised model is statistically significant (table 1). The model is characterized by a strong statistical dependence between variables. Variable tested explanatory-open source of innovation ($p = 0.00$) significantly ($p < 0.05$) determines the innovativeness of surveyed SMEs.

Table 1. The regression coefficient of the dependent variable - innovation and statistically significant independent variable - open source innovation in the group surveyed SMEs

Variable	b	The standard Beta error	t	p
Open source innovation	1,08	0,20	5,37	0,00

R^2 =0,79; F(3,96)=122,41

Source: own calculations based on the survey among 100 industrial enterprises from Poland.

Model results indicate a significant correlation and the positive impact of open source innovation for innovation studied a group of small and medium-sized enterprises.

In determining the relationship between innovativeness and open sources of innovation it was important to determine not only the existence of a relationship and the positive impact of open source of innovation on innovativeness of SMEs, but also which specific variable of open source of innovation have positive impact on innovativeness, which of them are statistically significant, and which have no meaning in terms of innovativeness of surveyed SMEs.

Table 2 shows the ratio between the size of regression equations of innovativeness index and statistically significant explanatory variables (at the significance level of $p < 0.05$) and the coefficient of determination (R^2) in the sector of surveyed SMEs.

The revised model is statistically significant (table 2) and is characterized by a strong dependence between statistical variables innovativeness of SMEs and feedback from suppliers of equipment, materials, components or software ($p = 0.00$), the information published in the articles, standards, metrology in the field of business of surveyed enterprises ($p = 0.01$), feedback from customers of companies ($p = 0.01$). Statistically significant predictors ($p < 0.05$), determine the innovativeness of SMEs. Other variables included in the explanatory variables of open sources of innovations are not statistically significant ($p > 0.05$) and therefore do not determine the innovativeness of SMEs (table 2).

Research model for the coefficient of determination R^2 indicated its validity. The coefficient of determination R^2 for the estimated model is 0.35, so it explains 35% of variation of dependent variable – innovativeness of SMEs. This means that 35% of the variability of innovativeness of SMEs can be explained by the level of variables specific open source innovations that are statistically significant within the model (table 2).

Table 2. The regression coefficient of the dependent variable – innovativeness and statistically significant independent variables – the channels of open sources of innovation in the group of SMEs

Variable	b	The standard Beta error	t	p
Free term	3,73	0,75	4,96	0,00
Feedback from suppliers of equipment, materials, components or software	3,13	1,04	3,02	0,00
Information from the published information in articles, standards, metrology	2,89	1,03	2,79	0,01
Feedback from customers	2,81	1,05	2,68	0,01

R^2=0,35; F(3,95)=16,69

Source: own calculations based on the survey among 100 industrial enterprises from Poland.

In order to compare the impact of particular variables of specific open source innovation Beta coefficients (b) were compered. Analysis of the coefficient b in the case of channels of open innovation sources indicated that the strength of association with all the specific explanatory variables was similar. The strongest innovativeness interacted feedback from suppliers (b = 3.13). There has been a positive relationship, which means that in case of growth predictor of any of the specific variables explaining the open sources of innovation is accompanied by an increase in the value of the innovativeness variable.

Conclusions

The research findings identified the influence of open innovation sources on innovativeness of SMEs. The survey showed which kind of channels of open sources of innovation are popular in the activity of surveyed SMEs and which of them have the positive influence on innovativeness of SMEs.

The surveyed companies declared the activity in the field of most channels of open sources of innovation. More than a half of them felt that customer feedback was essential for the introduction of new technological knowledge or obtaining knowledge about new developments in the field of production technology. Almost half of firms declared access to new technical knowledge or new knowledge about new developments in the field of production technology through the subscription of magazines, both scientific and technical. Equally important, due to the acquisition of new technological knowledge or the knowledge of new developments, were the feedback from suppliers of

equipment, materials, components and software, and participation in trade fairs and exhibitions. Every third company declared the use of thematic information published in the articles, standards and metrology, and gain significant technological expertise of employees. Every third company acquired new technological expertise through participation in industry conferences. In the case of open source innovation once again medium-sized companies showed greater activity than small companies.

In the range of recommendations for innovativeness performance and using the open innovation sources according to empiric analysis SMEs should increase the involvement in obtaining feedback in the form of new technological knowledge of its customers and suppliers of equipment, materials, components, software keys to increase innovativeness, especially in the product innovativeness. The second recommendation is to reduce the involvement of SMEs in the acquisition of new technological knowledge through participation in fairs and exhibitions and conferences industry as they do not bring innovativeness performance. SMEs should increase the involvement in the acquisition of new technological knowledge with articles, standards, metrology, and obtain it from the customers.

The surveyed companies declared that they frequently acquire new technological knowledge with feedback from the customers through subscriptions to trade journals, scientific and technical feedback from suppliers of equipment, materials, components and software. Equally often companies declared gaining new technological knowledge through participation in trade fairs and exhibitions. The surveyed companies declared the use of thematic information published in the articles, standards and metrology and obtaining a significant technological expertise of its staff as well as relevant in this regard indicated participation in industry conferences and associations and industry associations.

As the analysis in the study showed, not all of declared by surveyed companies channels of open innovation sources influence and play positive role in the innovativeness performance of surveyed SMEs. Statistical analysis indicated a positive impact on innovativeness of surveyed enterprises, in the case of those companies that have pledged to achieve new technological expertise of its suppliers of equipment, materials, components or software, and customers, as well as those companies which benefited from the published information in articles, standards, metrology in the field of activity of the surveyed enterprises. Detailed analysis of statistical models indicated that in terms of product innovativeness only feedback from suppliers of equipment, materials, components or software is relevant. In turn, on innovativeness in marketing area it is knowledge of new technologies derived from the articles, as well as standards, metrology and the company's clients that have positive impact.

As the survey has shown, SMEs within the framework of open models of innovation may cooperate with other entities, so they are able to have a positive impact on the shape and scope of solutions they want to win for the efficient and competitive operation in increasingly demanding market.

In addition, an important source of innovation in SME is knowledge flowing from the company (employees, managers) as well as knowledge acquired from outside customers, suppliers, subcontractors, subcontractors – channels of open sources innovation. The opportunity to be innovative in the modern economy is not only the domain of large companies with their own R&D facilities, but also SMEs enterprises as innovativeness can be built on this basis by using the ready-made or created in solutions available outside the firm.

Obviously, there is a need for future research. The most important points to future analysis are detailed cooperation aspects of open models of innovation and its influence on innovativeness of SMEs, as well as channels of open sources of innovation and its influence on innovativeness of research sample constructed of service SMEs and the influence of open sources of innovation on competitive advantage of SMEs.

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Entrepreneurship and Innovation – the Modern Concept of Regional Development

Abstract: Experiences from innovative regions demonstrate that a proven model for regional development is a development model associated with a leading university (universities), focused upon technologically advanced innovations, revealing another innovative technology, innovative product, innovative service which will exert influence upon the markets and transform the entire branches of industry. This model has a chance to prove itself in large regional centres (metropolises) that ought to possess a number of essential advantages. Regional centres ought to bring together a significant population, be characterised by the high level of Gross Domestic Product, the high level of Gross Domestic Product *per capita*, and need to concentrate the leading enterprises of innovative industries, enterprises fulfilling the requirements of large customers, business centres, as well as health and public sector institutions.
Key words: entrepreneurship, innovation, region, competition, location barriers

Introduction

"From the point of view of economy, space is not neutral" [Ponsard 1992], and that means that economic processes connected with it are carried out in this space. Individual entities of the regional space are a value for investors, customers, residents and self-government authorities, who are all stakeholders building relationships defined as network connections. The developing connections between an investor and a commune, between businesses and residents, between a city and a region, and between an entrepreneur – manager and a region, and so on, and so forth, are all the expressions of ne-

twork connections. The value of space entities, interpreted as a regional resource, finds its expression in the form of benefits which, to a greater or lesser extent, fulfil the expectations of the entities. The exchange of values between regional entities is the offer of unit benefits which can be acquired by, for instance, an investor searching for attractive locations for a planned business venture and, on the other hand, benefits which a particular partner of the exchange receives (for instance, the unit of local government), in the form of direct and indirect developmental factors (for instance, financial resources, jobs, taxes, and the diffusion of innovation), dynamising the development of the entire region, and of its socio-economic structures.

Entrepreneurship and innovation, and regional development

The most modern innovation centres were created near major and leading technical universities, such as Stanford, UC Berkeley and MIT, near Boston. The university model based upon collaboration between science and business results in the high level of transfer of research results into the economy, whereas collaboration between universities has developed horizontal links, which, nowadays, result in the large communities of technologists and entrepreneurs sharing ideas with each and every one. The transfer of ideas, employees, managers, the members of management board, and investors, takes place from one company to another, from a university to a company and back. It was possible to achieve the network effect. The network effect is of particular importance for the implementation of modern innovations because it gives the advantage of a scale which is almost not possible to be received in a different configuration.

Experiences from innovative regions demonstrate that a proven model for regional development is a development model associated with a leading university (universities), focused upon technologically advanced innovations, revealing another innovative technology, innovative product and innovative service, which will exert influence upon the markets and transform the entire branches of industry. This model has a chance to prove itself in large regional centres (metropolises), which ought to possess a number of essential advantages. Regional centres ought to bring together a significant population, be characterised by high Gross Domestic Product, high Gross Domestic Product *per capita*, and concentrate the leading enterprises of innovative industries, enterprises fulfilling the requirements of large customers, business centres, health and public sector institutions.

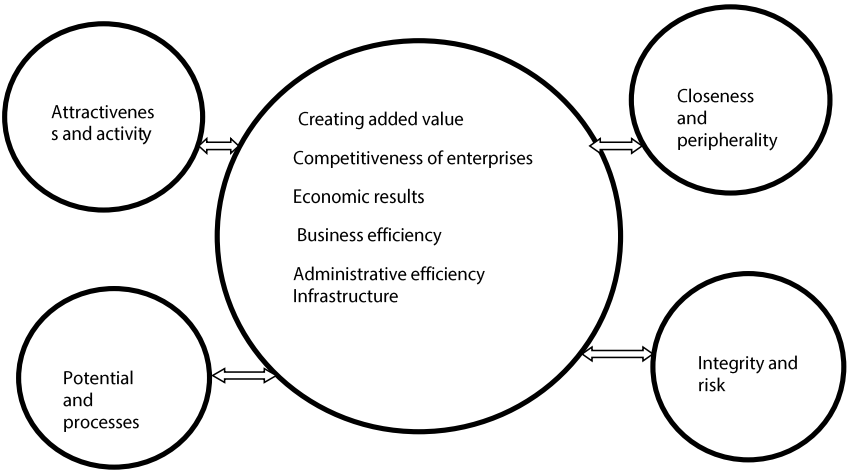
The objective of this article is to identify the factors and sources of regional competitiveness, and also to indicate the regional location-related barriers, which exert influence of various strength upon the development of particular regions.

In this dissertation, the following thesis was formulated: in a developed market economy, regions compete between one another for acquiring these factors of development which contribute to acquiring a permanent competitive advantage. The entrepreneurship and innovativeness of stakeholders are the significant factors of regional development.

Factors and sources of regional competitiveness

Regional competitiveness is a concept defined by the Organisation for Economic Co-operation and Development [Gorynia, Łaźniewska 2012] as the capability of regional entities and regions to compete in the global space, and to provide a comparatively high rate of return on the used production factors, a comparatively high level of employment [Grodzka 2017], with the real growth income of the population over an extensive period of time [Markowski 2016].

Figure 1. Determinants of regional competitiveness



Source: own research, based upon IMD World Competitiveness Yearbook 2003. IMD International (Institute), Lausanne, Switzerland, IMD, 2003.

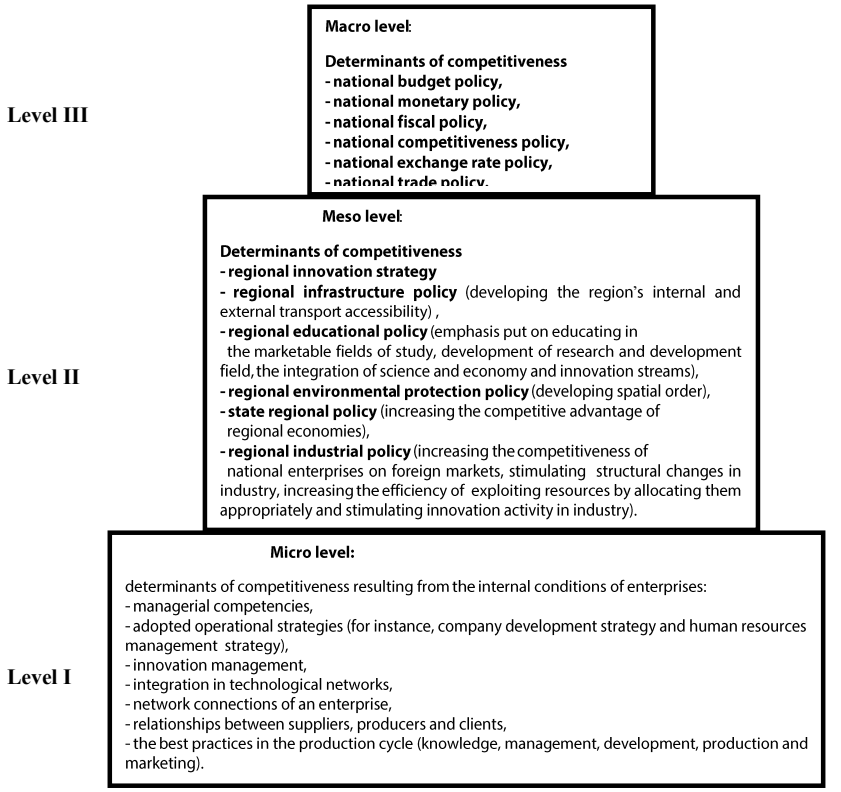
Therefore, it can be presumed that regional competitiveness is determined by four essential factors, and that means the following ones: economic results, administrative efficiency, business efficiency and infrastructure. The so-called regional competitiveness profile is exerted influence upon by a set of four overlapping streams of influence. They are: attractiveness and activity, closeness and peripheral character, integrity and risk (fig. 1).

Regional competitiveness is the capability of the regional economy to stimulate the region's internal resources for the purpose of competing and functioning upon a perma-

nent basis on domestic and global markets, and as the capability to adapt to changes on these markets. It ought to be observed that the competitiveness of the regional economy is not a simple sum of the competitiveness of entities operating in the region in question. The level of competitiveness of the regional economy is under the influence exerted upon by the networks of internal links between regional entities and the environment. This phenomenon can be considered at the three levels of competitiveness (fig. 2).

The term "micro level" is used in the reference to the potential of regional enterprises. It means that, at this level, the most important elements exerting influence upon the competitiveness of regional economy is price, the quality of offered products, the advancement of marketing (access to information, advertising, sales conditions, corporate brand, payment method, product assortment, and influence exerted by the product upon the natural environment [Markowski, Kudłacz 2017].

Figure 2. Levels of the competitiveness of regional economy



Source: own work.

At the first level, the determinants of competitiveness are, first and foremost, factors being the consequences of the internal conditions of enterprises, and, second of all, factors dependent upon the environment. These are managerial competences, operational strategies (for instance, company development strategy and human resources management strategy), innovation management, integration in technological networks, the network connections of an enterprise, relationships between suppliers, producers and customers, and the best practices in the production cycle (knowledge, management, development, production, marketing). The factors dependent upon the environment at the micro level include socio-cultural factors (for instance, quality of human capital and social capital), the behaviour patterns of entities and institutions in the environment, the capability of strategic and political actions undertaken by local governmental institutions.

The term "meso level" is used in the reference to the activity of regional economy entities, and to competitiveness in the aspect of becoming the leader in the industry and gaining permanent competitive advantage on the regional market. When assessing competitiveness at this level, it is indispensable to indicate the share of export production in the total value of production, expenditure on innovation and research and development activities and investments. At the second level, the determinants of competitiveness are regional policies implemented by the central and local government authorities.

The term "macro level" is the reference to the regional economy with the high level of growth, the high dynamics of production and service potential, which is a highly competitive economy, with the increasing level of employment and productivity.

The development of regional economy in our country is spatially diversified, and the economy in individual regions is at the significantly different stages of development. In accordance with the theses of Porter, it can be concluded that the regional economy, facing competitive challenges at the national and international level or global competition, undergoes a number of developmental stages which result from adjustment processes. Analysing the behaviour of the regional economy in the economic conditions of our country, which has had characteristics of the market economy for few years, it ought to be recognised that some regions are at the stage of competitiveness based upon production factors, a characteristic stage for the least developed countries, some regions are at the stage of competitiveness based upon investments, mostly imported investments (a characteristic stage for the so-called "catching-up" countries), and few regions are characterised by the economy based upon innovation, which stage is attributed to developed countries [Borowiecki, Siuta- Tokarska 2012].

Regional competitiveness sources specific to Knowledge-based Economy (KBE)

In accordance with the new paradigm, a developing region is a place where knowledge and innovation are created. The essential factors for the competitiveness of such a region are elements indicated as the components of intellectual capital, human capital, social capital, and the institutional environment as well as development capital and structural capital.

Human capital is one of the essential sources of competitiveness, and it plays a significant role in the regional economy. It is determined by its characteristics, namely by reduced mobility compared with financial capital and a long investment cycle connected with the improvement of its quality.

The essential characteristics of human capital which distinguish it from physical capital include the fact that it does not become a regional property, investments in this capital, and, therefore, investments in knowledge, usually require an extensive period of time and an appropriate social context [Butkiewicz-Schodowska 2015]. Human capital co-creates the intellectual capital of the region [Dziemianowicz, Szlachta 2016], which, together with social and organizational capital, represents the so-called hidden values, which ought to be defined as the intellectual infrastructure of the region. Well-educated individuals are not exclusively a means of implementing innovation in the region, but they are also innovative potential.

Social capital. For an extensive period of time, no deeper considerations were made on this term, until the publication of the works of P. Bourdieu and J. Coleman [Chądzyński, Nowakowska, Przygodzki 2007] in the mid-1980s.

P. Bourdieu defines social capital as a „set of real and potential resources associated with possessing a permanent network of more or less institutionalised relationships supported by mutual knowledge and recognition, or, in other words, membership in a group which provides each and every of its members with support in the form of the capital held by the collective, and credibility which gives them access to credit in the broadest meaning of this word".

Human capital and social capital as sources of regions' competitiveness are increasingly a determinant of regional innovation, and the acquisition of innovative capabilities has become one of the foundations of the concept of the learning region [Zaucha, Szlachta 2015]. The concept of "learning" regions is based upon the conviction which the capability to create specific and strategic resources is essential to the competitiveness of the region [Jewtuchowicz 2005]. Skills and knowledge are considered primarily as such resources. Emphasis is placed upon the fact that developing these resources is a process, because knowledge is valuable exclusively, when it is updated. In such conditions, the rapidity of learning is also important. The region which acquires information quickly, acquires a better competitive position.

Regional innovation, on the other hand, means the capability of the region to mobilise its potential, to become similar to regions commonly recognised as innovative. Taking over patterns of innovative solutions in the various areas of socio-economic life and the adaptation of modern development mechanisms. The region's innovation depends upon the multi-directional activities of entities oriented towards innovation strategies. In the innovation strategy, the principal "actors" are self-government authorities, managers, cities, universities, organizations, and as the most important participants in the innovation process, exert influence upon the generation, circulation and absorption of knowledge, and upon innovation in the region.

The principal sources of innovation, also referred to the development capital of the region, are the research and development activities of enterprises and scientific institutions, the import of the existing knowledge in the form of patents and licenses, and the purchasing of machinery, and of equipment. Measures used to determine the level of innovation of the region include: the level of expenditures on research and development in private and public sectors and their share in Gross Domestic Product, structure of financing research and development, number of patents submitted by regional universities and research and development institutes, number of patent implementations, employment in the research and development sector (private and public] [Węziak-Białowolska 2010], the share of innovative products in the region's total sales and exports.

The factors exerting influence upon the level of competitiveness of regions include the developed institutional framework of the economy. The institutional environment is defined as the "institutional structure", which in interpreted as "rules of the game in a given society or conditions determined by man, shaping interactions between people" [Pietrzyk 2000]. This structure includes historical conditions, traditions, practices, customs, behavioural norms, and legal, educational and fiscal systems. The institutional environment is also the subject-matter of reference in the documents of the European Commission and Organisation for Economic Co-operation and Development. The institutional environment creates opportunities for using its intellectual and social capital in the region.

Regional location barriers

The location barriers exert a different influence upon the development of regions, and the power of this influence is, to a large extent, dependent upon intra-regional and external factors. The self-government authority and the activity of regional structures exert a significant influence upon the duration and the scope of the barriers. The appropriate solution is to prepare and implement the regional strategy of reducing and eliminating the effects of location barriers. This strategy ought to be focused upon investors and ma-

nagers, for the purpose of restricting the influence exerted by location barriers upon the decisions taken by them, and to fulfill their needs and expectations, their personal and business objectives, for the purpose of being an appropriate reference point for shaping future offers, proposals and investment projects which maximise benefits (Table 1).

Table 1. Types of location barriers in regions

Barriers of the natural environment and economic space potential	Insufficient quantity and quality of resources in the form of: mineral resources, water, clean air, soil quality, soil buoyancy, geological structure, the shape and insufficient size of construction sites, quantity and quality of labour (lack of qualified labour force), the lack of housing, undeveloped settlement network,
Instrumental barriers – interventionism policy	1. Legal barriers, legal actions at the level of government and at that of the local government – at the level of government: laws, regulations, at the level of local government – spatial development plans and local management plans. 2. Administrative barriers – are connected with the activities of self-government administration in the field of, for instance, issuing building permits, supervision over investments, permits for the use of facilities, business permits, registration of companies. 3. Economic barriers – the policy of economic incentives: concessions, location preferences, exemptions or tax rebates, various fees (for instance, deposit, parking and notarial fees).
Generic criterion	
Natural environment barriers	They result from the exhaustibility of resources of the natural environment, insufficient resources, the unavailability of resources, the poor quality of resources, spatial allocation, the irrationality of use.
Demographic barriers	We consider them from the point of view of the resources of the labour force and their characteristics; Quantitative characteristics – insufficient labour force, the lack of manpower, the emigration of young and enterprising people, and low birth rate; Quality traits – the inappropriate structure of labour force education, inadequate structure of labour force qualifications, the inadequate age structure of the labour force, the rapid ageing process of the population.
Infrastructural barriers	Lack or underdevelopment of technical, economic and social infrastructure, the shortage of quantitative and qualitative infrastructure, technical and technological old age, low technical efficiency, high failure rate, insufficient service potential, especially on peak demand, restricted structure by type.
Social barriers	Intolerance of the local community, xenophobic behaviour, the negative attitude of the local community to technical progress, innovations and economic changes, the claims of trade unions and fears of changes, the lack of the involvement of local communities in the region's management process, the restricted entrepreneurship of the local community, high unemployment, the low level of education, the lack of activity in creating social capital structures, the low level of the personal income of the population, the lack of readiness to undertake civilization challenges, distrust and reluctance towards neighbours.
Political-administrative barriers	Low level of education and the activity of self-government authorities, the sluggish and corrupt behaviour of local government authorities, populism and non-market economic views, the negative attitude of local and regional authorities to investors, the restricted rapidity and flexibility of local authorities' response to changes taking place in the regional environment.

Source: own work.

Entrepreneurship as a factor of regional development covers a wide range of activities and behaviours of entities shaping the regional structure. The recognition of entrepreneurship as the driving force of economic development on a local, regional and national scale requires an in-depth analysis of entrepreneurship mechanisms, its connections with regional and local policy, defining the role of residents, managers, enterprises, local governments, universities and social organizations in this process, with the rapidity of regional growth, exerts influence upon the innovativeness of economic processes, innovation in the management of the units of local government, and consequently exerts influence upon the quality of life in the region and its competitive position. Entrepreneurship in organizational and economic structures is a part of the development value in the region, which contributes to the creation of a new quality of economy capable of using local and regional opportunities. It is through the prism of the markets that economic progress in the region is assessed, the satisfaction of the society with the standard of living, the resilience of regional management and sustainable development associating economic, ecological and social issues into a harmonised entirety.

Regional recommendations

1. Formation of an innovative culture

An innovative challenge faced by the regional strategies of innovations is raising the awareness of the importance of innovation for the development of regional economies. A low level of the awareness of the significance of innovation is observed in the case of the majority of regional stakeholders, including the lion's share of local communities as well as a large group of the players participating in economic processes, and that means entrepreneurs, self-governmental administration, and also scientific units.

Entrepreneurs, in particular, the leaders of small and medium enterprises, concentrate upon overcoming limitations in business activity, and they are not interested in collaboration with the science sector, which results from the weakness of human capital, and also from the low managerial qualifications of executive personnel.

Self-governmental authorities concentrate upon solving current problems, and are also interested in investments in infrastructure, financed with the use of the means provided by the European Union, the results of which will be visible in a few years. In turn, universities and scientists concentrate upon their essential tasks, and that means upon teaching and personal development; this is the criteria of assessment in their case. They are not interested in the transfer of the results of research into economy because they would benefit very little from that. Their getting promoted as scientists is dependent upon the number of publications rather than upon the number of patents implemented in practice.

2. Investments in human capital

Dynamic changes occurring in the markets, and, to a significant degree, their unpredictability, make entrepreneurs look for new competitive advantages and sources of permanent growth. For this, one ought to turn towards such values as corporate social responsibility, and also human capital, as the significant assets of an organization and the sources of advantages. Therefore, it is qualified employees and their most innovative qualifications, their creativity that ought to become the most innovative values in the eyes of leaders.

Investment in employees frequently does not require substantial outlays. Sometimes, it is enough to have a good idea and to implement it skilfully. External investments are more costly. In this field, human factor is worth relying upon as well. An interesting solution, ever more popular in USA and the West of Europe, is "investments in talent". This is a form of contemporary patronage, under which regions support young and talented individuals, and assist them in commencing their carrier.

3. Strengthening the potential and competences of small and medium enterprises

The basic cause for the weak innovativeness of small and medium enterprises is the low level of involvement in research and development work, which is caused by the lack of financial capital and by the weakness of the human capital of these enterprises. It is necessary to improve the availability of financial capital by means of supporting various funds which are interested in such collaboration.

4. Strengthening the research potential of universities by means of:

Adjusting curricula to the needs of the labour market and knowledge-based economy, increasing the participation of universities in continuing education, collaboration between universities with employers within the scope of strengthening the practical elements of teaching, the participation of employers in the process of educating students, supporting the entities of the entrepreneurship of universities (among others, academic business incubators, spin off and spin out companies, technology parks and academic clusters), strengthening new models/methods of managing a university, and increasing the financial participation of scientific personnel in the transfer of the results of research into economy.

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Towards Platform Defined Business – Complementarity at the Spotlight

Abstract: As markets become increasingly more competitive firms systematically move away from hierarchical integrated supply chains toward fragmented networks of strategic partnerships with external partners. Business practice indicate a growing number of businesses relying on the platform organizational structures. For such constructs superior product quality and customer appeal maintain necessary but it is the breadth of the ecosystem of related product and services that has become a prerequisite for success. It implies the focus on third parties, complementors, who develop and deliver diverse content to platforms as well as enhance platform's generativity. Although complementary relations should be the main reference while considering the network dynamics from different angles, the attention in the extant research gravitates toward inter-platform competition with platform owners as the central object. Thus, with the objective to contribute to the emerging literature on industry platforms, this conceptual article discusses main challenges concerned with orchestrating arm's length relationships with complementors, by departing from platform-owner-centered approach and focusing on behavior of interdepended contributors.
Key words: digital platform, value capture, value creation, complements, boundary resources

JEL classification: M15, O32

Introduction

Structural transformation induced by a pervasive information and communication technology intertwined with global dispersion of supply chains has been labeled as a third globalization, a globalization reconfigured by digital platforms and the cloud [Kenney, Zysman 2016]. Algorithmically driven reorganization enables efficient conversion of broad human efforts and consumer assets into monetized goods. Observable rise of digitally defined businesses is gaining considerable scholarly attention across diverse fields of technology management, innovation management, strategic management, industrial economics [e.g. de Reuver, Sorensen, Basole 2017; Wareham, Fox, Cano Giner 2014; McIntyre, Srinivasan 2017]. On-going discussions gravitate toward technologically framed business choices that shape the competitive landscape, define the influence of variety of autonomous agents on value creation, delivery, and determine the range of control over the compensation for work performed by networks of value co-creators [Jacobides, Cennamo, Gawer 2015; Venkatraman et al. 2014]. It is argued that in the current competitive context superior product quality and customer appeal maintain necessary but it is the breadth of the ecosystem of related product and services that has become a prerequisite for success [McIntyre, Srinivasan 2017]. Hence, complementary relations are being brought up front while considering the interplay between value creation and value capture within the interfirm network [Schreieck, Wiesche, Krcmar 2017; Cennamo, Santalo 2013]. There is a growing body of literature on strategies for exploiting network effects, however rarely addresses the dynamic tension between inter- and intra-platform competition. Thus, with the objective to contribute to the emerging literature on industry platforms, this conceptual article discusses main challenges concerned with orchestrating arm's length relationships with complementors, by departing from platform-owner-centered approach and focusing on behavior of interdepended contributors.

Strategic management perspective on complementary relations

From the strategic management perspective organizations can create value in an "exclusive" manner by combining own internally developed resources and capabilities or "collectively" with the use of external resources and capabilities accessed through inter-organizational relationships [Lavie 2007; Najda-Janoszka 2016]. Extant research and observed business practice indicate however that firms are rarely able, or want, to perform all their activities in-house [Lavie 2007; Niemczyk, Stańczyk-Hugiet, Jasiński 2012; Czakon 2012]. Hence, firms engage in various inter-organizational constellations driven by

expectations of additional opportunities for value creation and capture that derive from the access to extended set of resources and capabilities owned/controlled by partners. Complementary resources provided by cooperating partners may directly contribute to firm performance through enrichment, strategic bundling, and/or absorption by internalization [Lavie 2007]. Moreover, participating in collaborative endeavor can generate synergies not only at the level of the resource base but also across activity systems [Ford et al. 2011]. However, potential additional benefits come with potential additional costs [negotiation, adaptation, maintenance, etc.) for parties involved. Evaluation becomes challenging as it involves a broader context of other business relationships of a given firm [Hakansson, Snehota 2005].

Other studies turned the attention to the importance of the access to complementary assets for successful implementation of innovations by discriminating between generic and specialized ones [Teece 2001]. It is argued that while acquiring generic assets usually does not cause major problems, gaining access to specialized complementary assets is more challenging and time consuming. Specialization of assets implies special purpose, irreversible investments that raise the risks for the engaged party. Thus, it is assumed that the control over complementary assets gains in importance with a greater degree of asset specialization. Further, the problem of in-sourcing innovative activity was addressed with an open innovation paradigm, according to which firms make a greater strategic use of external knowledge (outside-in approach) and simultaneously decide to externalize certain components of their intellectual property [Chesbrough 2003]. By opening up an innovation process to complementors [customers, suppliers, universities, competitors], a formerly protected know how becomes a means for knowledge exchange, which is expected to ultimately lead to additional monetary and strategic benefits [Dahlander, Gann 2010; Chesbrough 2003]. However, given that open innovation model does not imply externalization of all possessed knowledge assets, the main challenge concerns ability to simultaneously protect and share proprietary components of know-how [Dahlander, Gann 2010]. An appealing approach discussed in the literature implies aligning product architecture with intellectual property according to a modular design [Henkel, Baldwin, Shih 2013]. Extending modularization from physical production process to intellectual property allows for managing a right balance between systemic and autonomous innovations triggering product development. Although partners may innovate on modules, a focal firm maintains proprietary those areas of knowledge that are sensitive and necessary for innovating at the product architecture level [Henkel et al. 2013]. Hence, modularity is commonly recognized as one of the fundamental drivers of the rise of platform businesses [Hidding, Williams, Sviokla 2011].

Platform defined business activity

Based on the logic of a relatively stable core coupled with variable peripherals [Baldwin & Woodard 2009], platform can be seen as a vehicle for combining scale and scope economics together with product differentiation at the same time. Although platform logic is not new in the management field and business practice [Rochet, Tirole 2006; Jacobides et al. 2015], the astounding advances in digitalization enhanced potential and accelerated omnipresence of platforms in the current environment. Hence, the concept evolved from a vehicle for developing product portfolios serving different market needs [platforms bounded inside firms], to markets enabling direct transactions across different customer groups [two-sided, multi-sided platforms], and to industry level structures generating innovation through derivative applications, developed by external complementors (industry platforms) (Table 1).

Table. 1. Platform types

Category	Definition	Distinctive focus	author
Internal platforms	Internal system of production enabling recombination of components within the firm boundaries	Product family	Piezunka [2011]
Multi-sided platforms	Markets enabling direct transactions across different customer groups characterized by network effects between these groups.	transactions	Jacobides et al. [2015, p. 18]
Industry platforms	Building blocks [they can be products, services or technologies] that act as a foundation upon which other firms develop complementary innovations	innovations	Gawer [2009, p. 45]

Source: author's own work.

Observed fast diffusion of platforms across industries [e.g. telecommunication finance, transport, healthcare, tourism) refers to those last types allowing for capitalizing on network effects [Gawer 2014; Eisenmann, Parker, Van Alstyne 2011]. Given that multi-sided platforms and industry platforms bring together many user groups [end-customers, suppliers, third-parties – complementors) the value of those platforms increases with the number of users in the same user group (direct network externalities) as well as with the size of a different user group (indirect network externalities) [Katz, Shapiro 1994]. Such network dynamics leads to a basic premise that platforms expected to be popular end up more popular [Katz, Shapiro 1994], and to a generally predicted outcome labeled as "winner-take-all", meaning that platform owners (holding property rights over platform) capture most of the value being created in the by participating parties [Cennamo, Santalo 2013].

Orchestrating networks of complementors

Businesses relying on the platform organizational structure have to manage the value creation and capture that occurs outside the company, in a broad network [Parker, Van Alstyne, Jiang 2017]. Thus, the main focus is on third parties, complementors, who develop and deliver diverse content (e.g. apps, plug-ins, extensions etc.), as platform growth is not limited by the necessity for developing proprietary assets [Parker et al. 2016].

Building on self-reinforcing effects of network dynamics there is a common agreed that the main mechanisms driving a platform's value are the increase in the installed user base and the availability of complementary assets [Cennamo, Santalo 2013]. Thus, striving to bring multiple sides on board as quickly as possible [Rochet, Tirole 2006], platforms encounter a key dilemma labeled as "chicken-and-egg-problem" [Caillard, Jullien 2003] as getting interest of one side depends on the number of users at the other side. Platform owners, as property right holders, have the right to determine who can participate in the platform's network, determine the rules of the platform [Eisenmann, Parker, Van Alstyne 2006], but the relationship with complementors is distinct from the one with suppliers – instead of a principal-agent dependency there is an arm's length relation [Tiwana, Konsynsky, Bush 2010]. Hence, the important challenge for platform owners concerns an effective way for encouraging complementors users in the absence of formal roles and hierarchical control structures. Extant research highlight the need to empower complementors through orchestration that aims at defining core architecture and transfer design capability to complementors [von Hippel, Katz 2002]. Such transfer occurs through boundary resources defined as "software tools, regulations that serve as the interface for the arm's length relationship between the platform owner and the application developer" [Ghazawneh, Hendfridsson 2013, p. 174]. Hence, boundary resources are often referred to as central strategic tools for managing cooperation and competition in platform ecosystems. Recognizing the importance of boundary resources for understanding platform dynamics, some scholars argue that the point of attention should be shifted from the core of the platform to boundary resources [Hendfridsson, Bygstad 2013]. Nevertheless, transforming organizational resources into platform boundary resources requires time and effort, as well as it triggers competing concerns whether to keep a resource proprietary as a source of competitive advantage in a given market [Svahn, Mathiassen, Lindgren 2017]. Further, even though a platform successfully transformed resources into boundary ones, complementors may not necessarily use them in expected mode and scale. Depending on the complexity of the developed solution it may take time to utilize boundary resources in an efficient manner. According to Kapoor and Agarwal [2017], it is the platform specific experience gathered by complementors through the process of learning by doing (trial and error experimentation, accumulation

of new capabilities) that has a direct influence on their ability to sustain superior performance. Moreover, experienced contributors may use various strategies for exploiting boundary resources beyond the initially designed field, which may negatively affect the performance of the platform owner [Karhu, Gustafsson 2015]. Thus, a well thought-out cooperation in the process of developing boundary resources appears critical as well as a deep understanding the design and usage of boundary resources by both sides – platform owners and complementors.

An emerging literature on platforms have discussed various strategies enabling rapid growth of installed base of participants. Most of those propositions refer to variation in pricing [e,g, Hagiu 2005], subsidizing one side of the platform [e.g. Eisenman et. al 2006], exclusive contracting [e.g. Armstrong, Wright 2007]. Existing studies provided interesting insights, however fragmented, since all those strategies have been investigated separately driven by the assumption that platforms introduce one dominant growth strategy at a time [Cennamo, Santalo 2013]. Addressing the gap, Cennamo, Santalo [2013] examined platforms implementing simultaneously two growth strategies aimed at managing complementary goods, one focused on improving content by stimulating competition among complementors, and the second focused on outcompeting rivals by securing exclusive platform applications. Obtained findings confirmed that combining different strategies for a rapid growth of networks generates strategic tradeoffs, which represent hidden constraints to "winner-take-all" approach. In result a narrow, intense focus on the network growth may instead undermine the very performance of a platform. Hence, there is a need for a more nuanced view on the intra-platform competition between complementors – as there is so many of them with often similar value propositions – and between the platform and complementors over the value created. There is a growing literature addressing the issue of inter-platform competition [e.g. Boudreau 2010; Eisenmann et al. 2011; Rochet, Tirole 2006], while the intra-platform competition remains relatively underexplored [Kapoor, Agarwal 2017; Tiwana 2015]. A recent study addressing this gap has examined interaction between value capture mechanisms used by platform owners and complementors' incentives to co-create value in the platform network [Schreieck et al. 2017]. Authors identified three broad mechanisms used for capturing value:

- Absorption – platform owner extends the core with functionalities or whole applications formerly offered by complementors (acquisition, imitation, extension),
- Co-selling – platform owner support complementors in selling their products (bundling, branding, certification, customer enablement),
- Verticalization – platform owner develops and implements vertical use cases together with complementors (customization to specific industries).

The findings indicated both reinforcing (co-selling) and alleviating (absorption and verticalization) effects on value creation. Such insights inform the general debate on the degree of platform openness, defined through technological features as well as through the perception of current and potential complementors [Boudreau 2010]. Despite an open provision of boundary resources (module interfaces) the intra-platform competitive dynamics may restrict the perceived freedom for complementors [Schreieck et al. 2017]. The role of perception in the decision making by complementors is to a large extent unexplored research area. Further, the business practice has confirmed that openness comes with a price. Although a very high degree of openness encourage complementors and enhances platform's generativity, it intensifies intra-platform competition between contributors and also makes difficult to control all activities and outcomes in the network [Benlian et al. 2015; Casadesus-Masanell, Halaburda 2014].

Conclusions

A review of extant research provides an interesting picture for designing further studies on platform defined businesses. Available findings as well as arguments presented in several recent studies suggest a privileged position of platform owners in business structures as well as in the scientific inquiry. Complementors, although defined as critical to the value creation within the platform ecosystem, have received significantly less attention. Scholars tend to focus on strategies used by platform firms to attract complementors and to compete against other rival platforms. There are scarce studies that provide insights into the performance of complementors, used competitive strategies, their interrelations within the platform as well as with the other market agents. Lacking understanding of how complementors create and capture value may not be without significance for effective orchestration of platform activities. Moreover, as platform design businesses become more and more complex and highly digitized, they exhibit various innovation dynamics on different levels of their technical architecture. Each level may contain different components, hence different networks of complementors, although it is also possible that some complementors may bridge across those levels. Considering such complexity it becomes even more evident that complementors should receive more scholarly attention that embraces not only technical issues but also perception that underlies further decision process. Further, shifting from a platform ownership-centric perspective it could be also promising to focus more on the actual linkage between platform and complementors, and conceptualize platform dynamics in terms of distributed actors that collectively tune boundary resources. Such a shift can enrich the picture by providing opportunity to observe and analyze strategizing on both sides – platform owners and complementors.

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Sustainable Enterprise and Organization: Systematic Literature Review

Abstract: The aim of the paper is to identify key topics and trends in research on a sustainable enterprise and a sustainable organization in order to contribute to mapping the research field. The analysis is based on systematic literature review of the core references indexed in the Business, Management and Accounting subject area of the Scopus database. The recognized key research topics in the field include: long-term competitiveness and success, enterprise/organization transformation for sustainability, responsible approach towards employees as internal stakeholders, searching for resource efficiency in the sustainability context and establishing sustainable relationships with external stakeholders in accordance with the triple bottom line philosophy.
Key words: sustainable enterprise, sustainable organization, systematic literature review

Introduction

The concepts of a sustainable enterprise and a sustainable organization may be identified among the emerging ideas in management studies. The earliest work on a sustainable enterprise indexed in Scopus database was published in 1989 (for a sustainable organization respectively in 1993). However, until 2010 the scientific productivity in the field was very limited. Showing a high level of novelty and growth rate, the research field encompassing both the aforementioned concepts has not been mapped thoroughly, yet. A search for the conjunction of phrases "sustainable enterprise/organization" and "systematic literature review" provides the only one item [Anthony Jr, Majid, Romli 2017] which, in fact, focuses on the issue of a collaborative enterprise. The aim of the paper is to fulfill this knowledge gap and identify key topics and trends in research on a sustainable enterprise and a sustainable organization in order to contribute to mapping the research field. Moreover, the contribution of the paper is getting several perspectives and approaches to understand and interpret the concepts of a sustainable enterprise and a sustainable organization.

The methodology of systematic literature review [Czakon 2011] was applied to achieve the aforementioned aim. Scopus was as a source of data for the sampling process. The research sample consists of the publications indexed in the area of Business, Management and Accounting category including phrases "sustainable enterprise" (N=40) and "sustainable organization" (N=35) in their titles. The technique of truncation (searching for "sustainable organization") was employed in order to cover both (i.e. British and American) spelling standards of English. In both cases the analysis was limited to top 10 highly cited works per category.

The paper consists of three main parts. First of all, the concept of a sustainable enterprise is analyzed. Secondly, the issues related to the idea of a sustainable organization are studied. Thirdly, the findings from the systematic literature review are synthesized in order to identify key research topics and trends. The work by Lis [2017b] was used a benchmark while designing the study and the paper structure.

Sustainable enterprise

As a result of the aforementioned research sampling process, the core references related to the concept of a sustainable enterprise are identified and listed in Table 1.

Table 1. Core references in research on a sustainable enterprise

No.	Author(s)	Publication year	Citations number
1	Teece	2007	2367
2	Keijzers	2002	52
3	Zollo, Cennamo & Neumann	2013	30
4	Dhinesh Babu, Gunasekaran & Venkata Krishna	2014	29
5	Parrish	2007	28
6	Chofreh, Goni, Shaharoun, Ismail & Klemeš	2014	26
7	Edgeman & Eskilden	2014	24
8	Sweet, Roome & Sweet	2003	23
9	Sekerka & Stimel	2011	19
10	Shrivastava, Ivanaj & Persson	2013	16
11	Potocan & Mulej	2007	16

Source: own study based on data retrieved from Scopus database [access: 20.12.2017].

The analysis of the contents of core references enables the authors to identify some tendencies and make an attempt to categorize the research output. The first category includes the papers focusing their attention on developing superior performance of companies and their competitive advantage in the long run term. It seems to be associated with assumptions of strategic management, and in particular the Resource Based View. The publications included in the second stream emphasize the issue of sustainability considered as a balance between the economy, the environment and the society or concentrate on one of these components.

Teece [2007] highlights the nature and importance of microfoundations of dynamic capabilities necessary to sustain superior enterprise performance in an open economy. He points out that the microfoundations of dynamic capabilities which are distinct skills, processes, procedures, organizational structures, decision rules, and disciplines are difficult to develop and deploy. Thus, the companies with strong dynamic capabilities remain competitive and successful in long run. Also Zollo, Cennamo and Neumann [2013] discuss a conceptual framework to study the evolutionary processes related to the efforts that firms are making to become sustainable enterprises. They claim that despite many research on sustainable enterprise, most authors pay attention rather to the question "what is a sustainable enterprise?" than try to find the way how to manage the process through which enterprises navigate the changes necessary to realize more

sustainable models of the enterprise. The main issue pointed out by the authors regards sustainability change initiatives in different elements of the company. In a similar vein, Shrivastava, Ivanaj and Persson [2013] explore holistic ways of understanding and creating sustainable enterprises. The authors highlight the necessity for transdisciplinarity while analyzing the issues of a sustainable enterprise. They argue that enterprise sustainability requires trans-functional, trans-disciplinary, trans-stakeholder, trans-aesthetic and trans-human knowledge that is possible through transdisciplinarity. Moreover, Sweet, Roome, and Sweet [2003] emphasize multidimensional character and complexity of an enterprise sustainability. They claim that sustainability requires from managers changing the way of thinking in order to integrate different facets of environment and business problems.

Sustainability has been a cornerstone in the strategic management research associated with competitive advantage. Thus, one of literature streams in the field focuses on resource planning and usage. Chofreh, Goni, Shaharoun, Ismail and Klemeš [2014] argue that firms need information systems enabling to facilitate their sustainability initiatives. They focus on the idea of the Sustainable Enterprise Resource Planning (S-ERP) system as a holistic solution to support sustainability initiatives. Also, Dhinesh Babu, Gunasekaran and Venkata Krishna [2014] draw their attention to the issue of making good use of an enterprise resources. In their work the considerable attention has been placed on using the resources optimally to ensure enterprise sustainability of cloud service providers as well as better quality of service provided by these companies.

While considering the issue of a sustainable enterprise, some authors highlight the aspects regarding triple bottom line, referring to the balance between the economy, the environment and the society [Parrish 2007; Potocan, Mulej 2007; Edgeman, Eskilden 2014]. According to this idea, a sustainable enterprise seeks to keep the balance among economic, ecological and social dimensions of the economic activity, achieving economic objectives which are ecologically accepted and socially expected.

Parrish [2007] argues that enterprises embodying specific organizing principles can contribute to the sustainable development of the social-ecological system. According to him, the value created by a firm is expressed through interactions with other elements of the social-ecological system which it exists within. So, a sustainable enterprise faces the problem of resolving a conflict between stakeholder values, enterprise values and social-ecological values. Regarding the triple bottom line idea, Edgeman and Eskilden [2014] point out the necessity to emphasize on enterprise excellence of social and environmental performance. The authors provide the framework for a sustainable enterprise excellence model. The model enables companies to drive an equity, ecology and economy triple top line strategy to produce triple bottom line people, planet and profit performance with innovation and organizational design playing pivotal roles in both the

model and its assessment. Sustainable enterprise values and ethics are highlighted also by Potocan and Mulej [2007]. According to these authors, the development of proper "sustainable" values requires the changes in culture and behavior of all enterprise participants. Thus, while discussing the idea of a sustainable enterprise they highlight the necessity for a holistic approach based on ethics of interdependence of enterprise components.

Given the fact that a sustainable enterprise takes care about the environment, some authors particularly focus on this issue. Keijzers [2002] underlies that new environmental preservation demands come forward so the new initiatives need to be employed to ensure adequate and sustainable social, technological, and infrastructural conditions for production. Moreover, he argues that evolving ethical values of intergenerational equity requires a timely transition to new business practices. Also, Sekerka, and Stimel [2011] highlight the issue of eco-sustainability. They provide a framework to help managers examine their strategic perspectives based on their firms' identity. The authors explore how the leaders should manage the change within their organizations to achieve eco -sustainability.

Summing up, the analysis of core references in research on a sustainable enterprise indicates a dyadic perspective to understand and interpret the idea of a sustainable enterprise. One literature stream argues that enterprise sustainability refers mainly to its superior performance and long-run success in today's competitive economy. This approach is highly associated with the issue of firm's competitive advantage emphasized in strategic management. Another relevant literature stream focuses on the concept of triple bottom line. According to this, enterprise sustainability means taking an attitude characterized by the anticipation of future consequences resulting from company decisions and activities.

Sustainable organization

Similarly, to the research output on a sustainable enterprise, the core references related to the concept of a sustainable organization, the second category analyzed in the paper, are identified and enumerated in Table 2.

Table 2. Core references in research on a sustainable organization

No.	Author(s)	Publication year	Citations number
1	Pfeffer	2010	198
2	Jabbour & Santos	2008	76
3	Lozano	2008	66
4	Bradbury & Clair	1999	37
5	Osborn	1998	35
6	Tregidga, Milne & Kearins	2014	35
7	Rios	2012	22
8	Ryland	2000	20
9	Aggerholm, Anderen & Thomsen	2011	16
10	Gibb & Adhikary	2010	15

Source: own study based on data retrieved from Scopus database [access: 20.12. 2017].

Among core references in research on a sustainable organization presented in Table 2, some leading authors focus mainly on the aspects related to the workers as an important group of organization stakeholders and thus to human resource management issues. Pfeffer [2010] provides the reader with the literature review concerning the direct and indirect effects of organizations and their decisions about people on human health and mortality. He highlights that the issues of social sustainability has received relatively short shrift in management literature. Moreover, he proposes a research agenda aimed at investigating the links between social sustainability and organizational effectiveness. The social side of a sustainable organization is also a concern of Jabbour and Santos [2008]. The aforesaid researchers present the main contributions of human resource management to develop sustainable organizations. In their paper, they study the relationship between human resources and organizational sustainability through providing the model based on a strategic and central posture of human resource management within an organization. Similarly, Aggerholm, Anderen, and Thomsen [2011] concentrate on the issues related to employees. Particularly, the authors focus on the topic of employer branding. They propose a framework for re-conceptualizing employer branding as a co-created processes aimed at sustainable employer-employee relationships. They argue that focusing on organization's sustainable development implies the changes in the approach to build the relationships with organization's stakeholders, including the employee-employer relationship. The approach suggested by Aggerholm et al. [2011] re-conceptualizes employer branding as an integrated part of a CSR strategy, thus offe-

ring a new way of approaching employer branding as supporting sustainable organizational development and long-term employer-employee relationships.

Another literature stream concentrates on the issues of organization's transformation towards sustainability. That is associated with organizations' competitive advantage and growth. It is worth noting that such a discussion began at the end of the 20th century and is still alive. Osborn [1998] proposes a new perspective on strategy formulation, management control and information systems design that support improving organization's sustainability. The author highlights the paradox regarding the fact that in the time of rapidly changing, global markets, organizations need to be flexible but yet remain stable. In his paper, Osborn proposes some systems and tools that encourage a productive balance between organization's flexibility and stability. Moreover, Bradbury, and Clair [1999] highlight that for the organizations oriented to sustainable development the way to achieve it may involve radical transformation not only of organizational practices, but also of the ways of thinking that led to those practices in the first place. In the similar vein, Rios [2012] addresses the problems regarding the fact that contemporary organizations face the tremendous complexity of the environment and they need to change the way to perceive an enterprise as a system. Rios argues that the crucial issue here is paying attention not to particular elements of an enterprise as such but to the interactions among these elements and the environment in which an enterprise exists.

Among pertinent topics regarding a sustainable organization, Lozano [2008] points out an issue of building more sustainability-oriented organizations through collaboration with other companies (even competitors), customers, governments, and other actors existing in organization's environment. Lozano provides a reader with a Multi-dimensional Sustainability Influence Change (MuSIC) framework treating it as a means of promoting integrated progress towards organization's sustainability. Also, Tregidga, Milne, and Kearins [2014] underlie the necessity for change in an organization that aspires to be regarded as sustainable. They mainly focus on a changing organizational identity over time. In their study, Tregidga et al. [2014] distinguish three categories of firms according to the character of the changes undergone within organizations: environmentally responsible and compliant organizations; leaders in sustainability; and strategically 'good' organizations.

On the other hand, Ryland [2000] underlies an organization's concern for the environment. However, he argues that this concern has not yet created enough pro-environmental behavior to ensure general sustainability. The paper discusses the gap between concern for the environment and action undertaken by organizations through presenting a Jungian perspective on environmental consciousness.

The literature includes also the articles focusing on the sustainability of non-governmental organizations (NGOs). Gibb and Adhikary [2010] turn their attention on the pro-

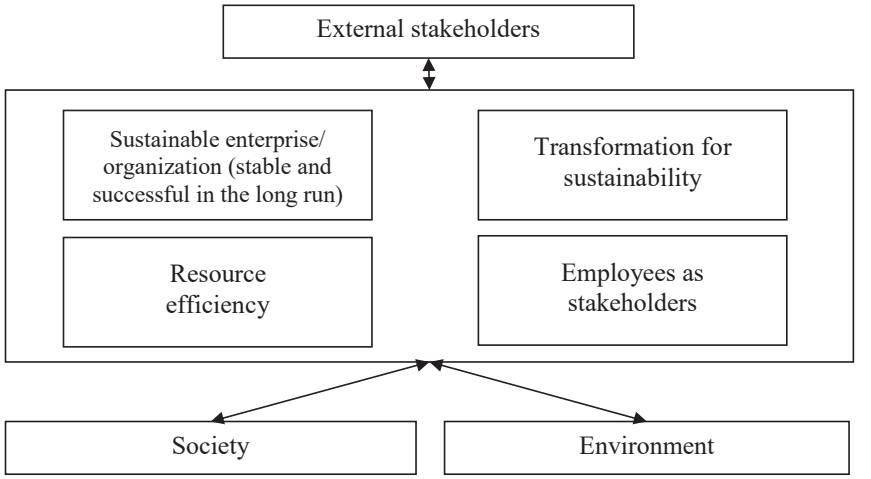
blem of how to combine sustainable outcomes from NGOs. The authors perceive NGOs as entrepreneurial organizations. Entrepreneurship aspects in NGOs refer to the fact that they conduct an activity of economic character and thus create value for the market. This attribute requires from NGOs being innovative and effective, because without innovativeness and effectiveness we cannot speak of entrepreneurship. Gibb and Adhikary argue that such entrepreneurial organizations, while focusing upon dynamic stakeholder network development, entrepreneurial management, strategic business development and strategic alliance building, are able to achieve the sustainable outcomes.

Summing up, the analysis indicates some trends in core reference publications related to the concept of a sustainable organization. First of all, a very strong emphasis on human resource management and building relationships with employees is observed. Secondly, the processes of transformation towards a sustainable organization are explored. The third stream of publications deals with the company relationships with other stakeholders and components of the triple bottom line i.e. the actors in their business environment, society and the natural environment.

Key research topics

The aforesaid analysis of core references and their contributions in the fields of a sustainable enterprise and a sustainable organization allows to identify various research perspectives. Thus, the paper contributes to mapping the research field. First of all, several authors concentrate on the issues related to entities competitiveness and success in the long-run. This stream is evident in both samples regarding a sustainable enterprise and a sustainable organization. Secondly, many researchers focus on the necessity to transform an enterprise/organization towards sustainability. Such transformation regards several processes, culture as well as employees attitudes. Employees, their values, health and well-being constitute the third perspective towards an enterprise/organization sustainability. Systematic dialogue with employees perceived as internal stakeholders of an enterprise/organization facilitates recognizing the variety of their needs in different periods of their careers. This is a prerequisite to develop a sustainable approach to work i.e. creating workplace conditions supporting employee engagement and maintaining them in an organization through the whole period of professional activity. The fourth approach appearing while analyzing core references presented in the paper, refers to resource efficiency as a significant aspect constituting an enterprise/organization as sustainable. The issue of depleting and thus limited resources goes hand in hand with the fifth perspective that focuses mainly on an enterprise/organization relations with its environment including the stakeholders in the business environment, society and the natural environment. The identified key research topics and streams are summarized in Figure 1.

Figure 1. Key topics in research on the concepts of a sustainable enterprise and a sustainable organization



Source: own study.

Identification of various perspectives regarding the interpreting what is the essence (the heart) of a sustainable enterprise/organization plays a pivotal role in sorting out different approaches in the studied research field. The aforementioned key research topics indicate the dualism in understanding the idea of a sustainable enterprise and organization. On the one hand, the adjective 'sustainable' refers to the ability of an enterprise/organization to survive, maintain its competitiveness, develop and be successful over the long period of time. Such an approach is typical of strategic management, and the Resource Based View in particular. On the other hand, the adjective "sustainable", derived from the noun "sustainability", means mitigating the negative impact of an enterprise/organization on its stakeholders, which is embedded in the assumptions of the concept of corporate social responsibility and the model of the triple bottom line. At the first sight, such dualism may seem to be a paradox. Nevertheless, when considered thoroughly, these two approaches seem to be complementary rather than conflicting each other. Following the ideas of sustainability and corporate social responsibility in relations to the organization stakeholders contributes to the company sustainable competitive advantage and its long-term survival and growth. Simultaneously, there is a need for integrating sustainability principles into the firm strategy to enhance the enterprise engagement into the triple bottom line philosophy and shift from "responsive CSR" to "strategic CSR" [cf. Porter, Kramer 2006] in order to contribute to economic, social and environmental benefits.

Conclusions

The concepts of a sustainable enterprise and a sustainable organization have been studied in the research output indexed in the Scopus database published since the late 1980s and beginning of the 1990s. The growing intensity of research productivity has been observed since 2010. As a result of the systematic literature review of the core references, some key research topics can be identified among the studies related to a sustainable enterprise and a sustainable organization. They include: long-term competitiveness and success, enterprise/organization transformation for sustainability, responsible approach towards employees as internal stakeholders, searching for resource efficiency in the sustainability context and establishing sustainable relationships with external stakeholders in accordance with the triple bottom line philosophy. The aforementioned research topics identified within the field are embedded in two paradoxically disjunctive, but in the matter of the fact conjunctive, streams referring to a sustainable enterprise (or an organization) which is long-lasting and successful over the long-term and follows the triple bottom line philosophy. Such dualism of a sustainable enterprise (organization) seems to be its inherent feature combining in one concept the assumptions of strategic management and corporate social responsibility.

Concluding, the limitations of the study process should be mentioned. First of all, making explicit the limitations related to the sampling process, Scopus database is considered as a source of high quality publications but using it for research sampling results in a natural bias towards publications written in English. Secondly, due to the limitations of the length of the paper, the number of publications selected for the review was restricted to ten items per each sample (i.e. a sustainable enterprise and a sustainable organization). Thirdly, selecting the most cited papers as core references to be analyzed established a natural preference for the earliest works while making the latest publications under-represented. Finally, acknowledging value of the systematic literature review as a method used for mapping the study field, the lack of triangulation of research methods should be considered as a weakness of this paper.

Taking into account the aforementioned limitations of the study, the following recommendations can be provided for further research. In regard to the sampling process, it is recommended to replicate the study based on the systematic literature survey methodology while using different databases and extending the number of analyzed publications. As regards the triangulation of research methods, it is recommended to apply bibliometric methods such as research profiling [Porter, Kongthon, Lu 2002; cf. Martinez, Jaime, Camacho 2012; Lis 2017a; Lis, Cegliński 2017] and citation analysis [Boyack, Klavans 2010] in order to increase the objectivity of mapping the research field related to the concepts of a sustainable enterprise and a sustainable organization.

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Evaluation of Rewards Programs as an Element of Sustainable Employee Rewards – Research Results

Abstract: Theoretical concepts such as *Human Capital Management* (HCM) and *Corporate Social Responsibility* (CSR) set a new direction in the development of employee rewards by focusing on shaping sustainability in rewards systems. One important aspect of sustainable rewards is the evaluation of the effectiveness of employee rewards systems. This paper explores the understanding of sustainable rewards and underlines the importance of rewards evaluation as an element of sustainable rewards. Employing a quantitative approach, the author examines whether or not organizations provide evaluation of rewards effectiveness and also provides some practical implications regarding such evaluation. The results of the study show that, currently, only 13% of studied organizations provide an evaluation of their rewards, with most of these using hard indicators, however more and more employers are paying attention to employee expectations and satisfaction from the rewards systems.
Key words: sustainable rewards, evaluation of rewards effectiveness, rewards, corporate social responsibility

Introduction

New ideas and theories have a strong impact on changing and developing organizational procedures and practices. Theoretical concepts, such as *Human Capital Management* (HCM) and *Corporate Social Responsibility* (CSR), set a new direction in Human Resources Management. This new direction is called Sustainable Human Resource Management – SHRM [Ehnert 2008; Pocztowski 2016]. Within this approach Sustainable Employee Rewards seems particularly important [Beck-Krala, Klimkiewicz 2017]. SHRM quantifies the

return on investment in Human Capital and, at the same time, addresses the needs and well-being of the organization's key stakeholders – its employees. Although both these theoretical concepts (CSR and HCM) have been discussed in the literature for a few years, the literature exploring employee rewards in the context of sustainability, particularly in Poland, is rather scarce. Therefore, this paper is an attempt to fill the existing gap in the literature through its discussion of sustainable rewards. Drawing from the literature review, it can be seen that the evaluation of the effectiveness of rewards programs is one important aspect of sustainable rewards [Sahakiants, Festing, Steger 2015; Scott, Beck -Krala 2018, in press]. Thus, the purpose of this paper is to draw the attention of theorists and practitioners to the importance of sustainable employee rewards and the evaluation process of the effectiveness of rewards systems. Moreover, it will contribute to the scarce literature on the effectiveness of evaluating rewards systems. The author raises several research questions that are discussed in the paper:

1. What do sustainable rewards mean and how are they defined in the literature?
2. How can the effectiveness of rewards in the context of sustainability be understood?
3. Do employers provide evaluation of rewards effectiveness in organizations in Poland?
4. If evaluation is provided, what measures are used?
5. Do employers focus on their main stakeholders by examining the expectations and satisfaction of their employees?

Finding answers to these research questions determines the layout of the paper. In the first part of the paper, the literature review concentrates on the concept of sustainable rewards and on the evaluation of the effectiveness of rewards systems as important aspects of sustainable rewards. In the second part of the paper, through an examination of quantitative studies, the author determines if organizations in Poland provide evaluation of the effectiveness of rewards systems.

Sustainable employee rewards in the light of the literature review – theoretical background

Human Capital Management and Corporate Social Responsibility have strongly influenced Human Resources Management in two important areas. The first area stresses the importance of developing human capital and improving organizational performance in a wide sense via economic, environmental, and societal outputs. The second area focuses on prevention of possible negative societal impacts of business operations and practices – according to the rule "do not harm" [*European Commission* 2011; Pocztowski 2016]. This

approach is called Sustainable Human Resources Management. Although the concept of SHRM had been present in the international literature for almost a decade publications embracing this approach are still quite rare [Ehnert 2008; Pocztowski 2016]. Sustainable HRM refers to human resources programs, procedures, and practices that lead to harmonious development. This takes into account not only organizational growth but also the overall development of employees within the organization [Beck-Krala; Klimkiewicz 2017], and other main stakeholders of the organization (e.g., shareholders, customers, local community) as well. In practice, SHRM focuses on achieving organizational goals while improving employee well-being through:

- reducing stress at work and implementing a policy of equal treatment,
- developing a supportive work environment and work-life balance,
- building a culture of trust,
- increasing the employability level and possibility of professional development,
- offering competitive total rewards packages and an attractive level of remuneration,
- transparent communication [Borkowska 2006; Docherty, Forslin, Shani 2002; Ehnert 2008; Beck-Krala, Klimkiewicz 2017].

Particularly important within this approach is employee rewards, as this has a strong influence on employee behavior as well as on employee well-being. The idea of rewards systems in relation to the sustainable development and social responsibility of organizations has recently surfaced in the literature [Moxey 2016; Sahakiants, Festing, Steger 2015]. However, few publications shed light on an understanding of what sustainable rewards entails. According to the literature, sustainable rewards means shaping and evaluating rewards systems within an organization to foster the integration of key stakeholder goals, creating mutual understanding and dialogue, in addition to analyzing the long-term effects of such action [Beck-Krala, Klimkiewicz 2017]. This approach stresses the role of human subjectivity in the creation of favorable conditions for further sustainable development of the organization and its employees. Thus, well-designed rewards simultaneously meet the goals of the organization and the expectations of the main stakeholders – employees, managers, and shareholders through motivating employees to desirable behaviors and outstanding performance. However, when poorly designed, rewards programs, particularly incentives, may also result in employee counterproductive work behavior, such as aggressive risk-taking, mis-selling, fraud, destruction and misuse of organizational property [Werbel, Balkin 2010]. These negative results can also have detrimental consequences for other stakeholders and the organization itself [Spector, Fox, Domagalski 2006], such as demonstrated by Enron and Wells Fargo, large companies that lost their reputations or became bankrupt because of the unethical behavior of their employees who were motivated by improper or abusive rewards programs.

This is why the literature underlines the importance of designing sustainable and responsible rewards programs [Klimkiewicz, Beck-Krala 2017] and their systematic evaluation and monitoring [Armstrong, Brown, Reilly 2011; Scott, McMullen 2014].

Evaluation of rewards programs

Sustainable rewards systems assume that regular monitoring and evaluation of their effectiveness to achieve organizational goals and support employee well-being will occur [Scott, Beck-Krala 2018, in press]. A systematic and comprehensive assessment of the rewards systems can be a source of many benefits for both the organization and its employees. The most important components of this assessment include:

- determining whether the rewards programs are well established and promote important values and an equal treatment policy,
- verifying whether the programs meet their planned objectives and support both core human capital objectives and the objectives of the company,
- verifying if the programs motivate employees to high performance and create employee engagement
- verifying if employees are satisfied with the programs,
- diagnosing early potential problems with the programs and looking for further developments,
- determining if the costs of the programs are optimized and affordable [Scott, McMullen 2014; Armstrong et al. 2011; Corby, White, Stanforth 2005].

Monitoring the effectiveness of rewards programs is even more important today when many organizations face extensive competition for talent while working to optimize their costs. According to some researchers, intuition and best practices are no longer enough, as rewards programs must be evaluated based on hard facts and quantitative measures [Gross, Friedman 2004]. Incorporating the CSR approach requires a more comprehensive methodology that includes both shareholder and stakeholder views [Klimkiewicz, Beck-Krala 2015]. Therefore, effective sustainable rewards systems will focus on both economic efficiency (profit-oriented) and effectiveness (goal-oriented), and also be responsible to their main stakeholders [Beck-Krala 2017]. The responsibility dimension is part of the sustainable rewards, which means that the ethical aspects of rewards effectiveness (such as social justice and long-term impact of the system according to the rule "do not harm") are extremely important and should be considered. In the case of employees, responsible rewards, according to the rule, *does not harm*, means avoiding *over-exploitation* of employees [Enhert 2008] causing in a long term work-related stress, work-family conflicts and even health problems and employee burnout. Thus, shaping

sustainable rewards systems, apart from the economic efficiency and effectiveness, will focus on creating a policy of equal opportunities, offering fair remuneration, healthy and safe work environment which might be extended to work-life programs.

As employees are the first and the most important stakeholders of the organization, their point of view may be taken into account when evaluating rewards system. Therefore, widening the meaning and scope of rewards systems effectiveness will include both quantitative as well as qualitative measures, such as the employees' opinion on the rewards system. An analysis of the main approaches towards rewards evaluation reveals common components of such evaluation [Armstrong et al. 2011; Beck-Krala, Klimkiewicz 2016; Greene 2010; Scott, McMullen 2014]:

- economic efficiency (productivity, operational costs);
- integrity with the business strategy;
- compliance with the law, regulations, and moral standards;
- external attractiveness of rewards that allows for the achievement of systemic and organizational goals (recruiting, engaging, and retaining talent);
- employee understanding of and satisfaction with the rewards.

Some researchers indicate that the perspective of other stakeholders, such as customers and the local community, may be also important [Borkowska 2006; Beck-Krala 2017], and that there is a need to evaluate the whole system, "according to the social and environmental impact that the organization exerts toward its stakeholders" [Klimkiewicz 2017, p. 14].

Despite the need to assess the effectiveness of rewards programs, few organizations evaluate them on a regular basis [Scott, McMullen 2014; Armstrong et al. 2011]. Most often, the failure to evaluate rewards systems is due to a lack of knowledge and experience of the HRM professionals and the lack of good practices and reliable and universal instruments for evaluating the rewards programs [Armstrong et al. 2011; Scott, McMullen 2014].

Research methodology

Exploring the issues pertinent to this paper and answering research questions 1 and 2, as identified in the introduction, required a review of the literature followed by empirical research.

The quantitative research was conducted using a standardized questionnaire-survey distributed among 264 organizations in Poland. The quota sampling was applied, where the main assumption in selecting respondents was the access to HRM specialists and managers involved in shaping HRM policy in organizations, who understand modern trends in management. Therefore, the research was carried out among participants of

post-graduate studies in management profiled in terms of modern management concepts. The main objective of this research was to examine whether employers in Poland evaluate the effectiveness of the applied rewards systems and, if so, what measures they use for this purpose (research questions 3 and 4, as noted in the introduction). We were interested in discovering whether the employers focused on the important hard measures when analyzing the economic effectiveness of the system or, instead, incorporated qualitative measures that are important for sustainable rewards, as, for example, measuring employee expectations of the rewards system and their satisfaction with the system. The questionnaire was directed to specialists and HR managers tasked with administering employee rewards programs (in the case of large companies); in the case of small companies, the respondents were the owners or managing directors. The survey took place in 2013 and 2014. The tool uses a four-level Likert scale with the possibility of answering: "yes", "sometimes", "seldom", and "never".

Research Results

Basic statistics were employed in analyzing the results to identify statistically significant correlations among variables. For the Pearson chi-square independence test, the independent variables were the number of employees in the companies, profitability, and the capital structure of the company.

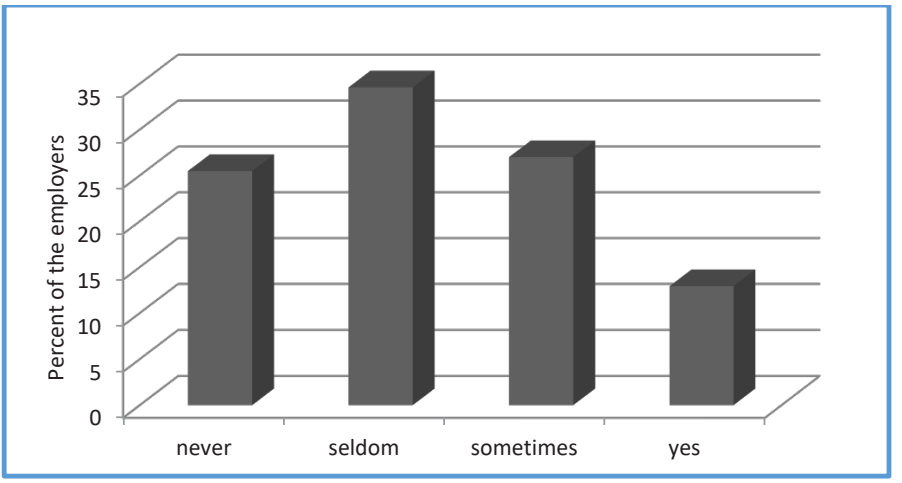
When looking at the research sample, over 41% were large enterprises (employing over 250 employees), fewer than 19% were medium-sized companies (50–250 employees) and 40% were small companies (25–50 employees). The survey was dominated by enterprises with domestic capital (53.79%), followed by mixed-capital enterprises at 32.57%, and the fewest were enterprises with only foreign capital (13.64%). The examined enterprises represented various sectors and industries such as: mining, machinery, automotive, chemical and pharmaceutical, food, financial and IT. Among the sample 58% were service companies, 25% trade and 16% production companies. A significant majority of the surveyed companies 83.27% recorded a profit in the previous year, and an even greater number (over 87%) had a good or very good financial condition, in the opinion of the respondents.

The questionnaire included questions on the effectiveness of the analysis of the HRM system, as the majority of companies that actually evaluate their rewards also assess the effectiveness of the entire HRM, which is important for sustainability. According to the results in 17% of companies, managers and specialists answered that such research is carried out, which may indicate that such analyses are regularly conducted. The remaining 23% of employers "sometimes" evaluate the effectiveness of the HRM, which may

suggest that these analyses are not regularly performed. For the remaining companies, such studies are "never" or "seldom" conducted.

An examination of the research results shows that only 13% (12.98%) of the analyzed companies declare conducting such analyses on a regular basis (34 companies). In these companies, HR specialists and managers clearly indicated the evaluation was conducted and actually performed systematically by answering "yes". It can be assumed that the answer "sometimes" – 27.1% of employers – implies a sporadic study and not necessarily a purposeful approach to such a study. Then, 34.60% of companies seldom carry out such evaluations and 25.48% certainly do not carry it out (Figure 1). We can assume that almost 60% of the surveyed companies do not evaluate their rewards systems.

Figure 1. Evaluation of rewards systems among the employers studied



Source: own study.

The research showed that evaluation of the rewards systems is carried out significantly more often by companies operating with foreign capital. Interestingly, almost twice as often, the analysis is carried out by trading companies (20.9% of such companies) in relation to service and production companies. Moreover, among companies that investigate the effectiveness of their rewards systems, most had earned a profit the previous year. Significant statistical correlations were also noticed relative to the number of employees and the evaluation process as large companies provide such assessment more often than medium or small ones (Table 1). This may indicate both the functioning of these companies in a competitive environment (industry), as well as the knowledge and high competencies of managers and specialists working there.

Table 1. Evaluation of rewards systems in companies according to the number of employees

Reward evaluation		Number of employees in the company						Total	
		Less then 50		Between 50–250		Over 250		N - Number of companies	[%] Percentage of companies
		N	%	N	%	N	%		
Do you evaluate the effectiveness of rewards ?	Never	43	40.2	11	22.9	13	12.0	67	25.4
	Seldom	36	33.6	17	35.4	39	35.2	92	34.6
	Sometimes	19	17.7	15	31.2	37	34.3	71	27.0
	Yes	9	8.4	5	10.4	20	18.5	34	12.9
Total		107	100	48	100	109	100	264	100,00

$chi^2 = 27.26$; $p < .001$

Source: own study.

Research question 4 concerned the measures used when assessing the rewards systems: What measures do employers use if they evaluate the effectiveness of rewards systems?

Research question 5 asked if employers focused on their main stakeholders by examining the expectations and satisfaction of their employees.

According to the research, most companies rely on the so-called "hard" measures – more than 52% of surveyed companies that evaluate rewards systems use performance measures based on labor efficiency for this purpose. The most common of these consist of: labor productivity measures (42%) and quality of work (32%), further measures of material consumption savings (18%) or shortening of task implementation time (16% of companies). When using these indicators, it was noticed that a significantly greater percentage of large companies used such measures than did medium-sized or small companies. Less frequently, companies use such indicators as employee cost reimbursement rates (7.2% of companies), service costs (7.9%) and labor profitability ratios (7.2%).

Research also showed that employers are much less likely to supplement this assessment with qualitative measures, such as the opinion of managers or employees (Table 2), even though employee satisfaction with the rewards system is a key indicator of the evaluation [Juchnowicz 2011].

Table. 2. Conducting the rewards satisfaction survey among companies

Conducting of the satisfaction survey		Number of employees in the company a						Total	
		Less then 50		Between 50–250		Over 250		N - Number of companies	[%] Percentage of companies
		N	%	N	%	N	%		
Does the company conduct satisfaction survey from their rewards system	Never	81	75.7	36	75.0	59	54.1	176	66.6
	Seldom	1	0.9	0	0.0	0	0.0	1	0.4
	Sometimes	1	0.9	0	0. 0	0	0.0	1	0.4
	Yes	24	22.4	12	25.0	50	45.9	86	32.6
Total		107	100.0	48	100.0	109	100.0	264	100,00

$chi^2(6) = 17.46$; $p = .008$

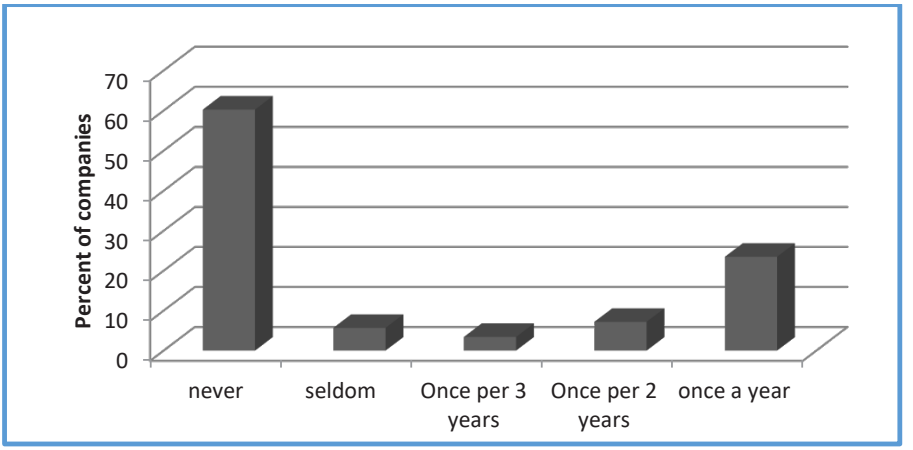
Source: own study.

Employee satisfaction with rewards is a key component of sustainable rewards and significantly affects the implementation of the objectives set for the system. Unfortunately, among the respondents, only 33% of companies ask employees about their satisfaction with the rewards system. Among these, over 45% of large companies carry out such a study compared with 25% of medium-sized companies and 22% of small companies (Table 2).

When asked about the use of indicators such as HC ROI (Human Capital Return on Investment), 25.8% of the surveyed employers who indicated conducting the rewards evaluation study used this measure. Among this number there is a comparable number of small and large companies. In this case, measurement of such quantities can often be a part of a larger study; for example, the general impact of HR policy on the company's performance rather than the rewards system itself.

An important aspect of a sustainable rewards system is the creation of employee well-being; hence, the important question was whether an employer examines the needs and expectations of employees in terms of rewards. The percentage of companies that build rewards systems based on the real needs and expectations of their own stakeholders – employees- is relatively low. Fewer than 40% of companies indicated that they examine the needs and expectations of employees in the scope of the rewards system, while over 60% of companies do not carry out such analyses. The largest number of companies provide such analysis once a year (23.48%), once every two years (7.20%), and once every three years (3.41%); the remaining 5.68% of companies carry out such research even less often.

Figure 2. Examines the frequency of such surveys conducted on employee needs and expectations regarding rewards



Source: own study.

The research also indicated a significant correlation between the number of employees and the examination of employee needs and expectations when designing rewards. Among large companies, 47.71% examine employee expectations in this regard, 37.5% of medium-sized companies, and 31.7% of small companies also examine these expectations.

Conclusions

Drawing from actual trends in management, we can see that more attention is being put towards sustainability and value creation through employees, indicating a new direction in HRM – sustainable rewards. One of the core elements of sustainable rewards is the systematic monitoring and evaluation of rewards systems that will allow the company and its main stakeholders to achieve further development and enhance well-being. Such evaluation seems extremely important in the face of emerging information concerning abuses within companies. Reported cases of abuse related to unethical management practices (e.g., employee exploitation, wage discrimination) or counterproductive employee behavior seem to confirm that the present discourse of management science related to the need for a comprehensive evaluation of the effectiveness of employee rewards is headed in the right direction. Evaluation of rewards systems needs to be comprehensive and capture all of the most important aspects of sustainability. Addressing only econo-

mic efficiency and performance evaluation is definitely insufficient in today's reality with its pressure on sustainable development. Despite the necessity of such evaluation and monitoring of the effectiveness of rewards systems, the results of the research presented in this study showed that only 13% of the employers surveyed are aware of and carry out such analyses on a regular basis. This is a smaller number of companies compared with those that indicate they conduct an evaluation of overall human resources management practices, which was indicated by about 40% of the surveyed entities. It is comparable with other EU countries [Armstrong et al. 2011], however, the number is much smaller than in the US [Beck-Krala and Scott 2013]. It is no wonder that most companies that declare that they evaluate their rewards systems are large, international organizations with good financial standing, operating in such industries as IT, financial, pharmaceutical and automotive. When looking at the measures most commonly used by employers in this study to assess this effectiveness, we find that quantitative indicators related to job performance evaluation, e.g., improvement of productivity and quality of work are most often cited, as declared by more than half of the respondents. Furthermore, their focus continues to be mainly on quantitative measures, which is most often characteristic of employers who consider rewards mainly in the context of the costs they generate, not the potential investment in employees and the benefits that the system can bring to the organization [Scott, Morajda, McMullen 2006]. Qualitative measurements, important when creating sustainable rewards, such as employee satisfaction surveys or manager interviews, are rarely used. Again, these measures are mainly used by companies with foreign capital and, more frequently, in commercial and service companies. Moreover, the type of business significantly influences the use of measures, for example, performance-based quantitative measures are mainly used by production companies, while quality metrics can be found more frequently in both production and trade companies. Employers are just beginning to incorporate qualitative measures which are important in the analysis of stakeholders and particularly in regards to employee well-being. However, it would be advisable to use more balanced approach to rewards evaluation, which incorporates both hard and soft measures.

This study is not free of the limitation, as it focuses only on one, most important group of stakeholders – employees. It would be desirable to verify if employers focus on others stakeholders' groups, such as customers when designing sustainable rewards systems and evaluating them.

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Managerial Aspects of Employing People with Asperger Syndrome in Poland

Abstract: The article presents managerial and organizational aspects of employing people with Asperger Syndrome in enterprises in Poland. In the research process, the author conducted theoretical studies in the field of law, management and psychology (applicable legal acts, subject literature, specialist articles, reports and studies), case studies and direct interviews. On this basis, the author presented recommendations in the field of choosing a profession for people with Asperger Syndrome (AS), as well as requirements for recruitment, selection and organization of work. In particular, the author formulated recommendations for employers intending to employ individuals with AS.
Key words: Asperger Syndrome, human capital management, employment

Introduction

In 2001, the Wired magazine published an article that stated that companies located in Silicon Valley employ a lot of people with Asperger Syndrome. At the same time, it was suggested that in addition to many undeniable advantages, it is also a threat, because the population of people with AS may be too large and have a growing tendency [Silberman 2001]. On the other hand, the author also presented other reasons for this situation, that is: better diagnostic methods, more detailed statistics on the occurrence of this disease in the US, or separation of AS from autism, etc. However, the author also quoted the following words by Rollens (former secretary of the California Senate and cofounder of the MIND Institute): "Anyone who says this epidemic is due to better diagnostics, has his head in the sand" [Silberman 2001]. Ten years later, Robertson compared an association between Asperger's and the "geek culture" common in companies of Sili-

con Valley. The author noticed that although there are many similarities between these behaviours, there are scientific grounds for undermining the thesis formulated in the Silberman's article. Robertson listed that: 1) education, not the type of profession is the variable key – regions with higher concentrations of autism are ones where the parents are more educated; 2) mothers in high tech jobs were slightly more likely (6.7% vs. 4.0%) to have children with autism than mothers with similar educations working in different industries; 3) no evidence was found that fathers in high tech fields had a greater likelihood of having children with autism; 4) parents who have children later in life are at a higher risk of having children with developmental delays [Robertson 2011]. However, the author did not present strong arguments for falsifying Silberman's thesis.

The upward trends and high dynamics of the occurrence of an increasing number of people with AS have also been noticed in Poland. Therefore, it was decided to investigate the problem of functioning of people with AS on the Polish labour market, especially in the context of forecasts regarding changes in the so-called "Future professions". For several years now, not only on the Polish labour market, the most sought-after specialists are programmers, IT specialists (especially in the field of systems security) as well as process, quality and R & D (research and development) engineers [Szewczak 2016; Nowak 2017].

The aim of the paper is therefore to draw attention to the existence of people with AS in the Polish society as an attractive group of employees, but still not fully utilized. Therefore, the article presents special requirements for effective management of people with AS. The issue of the article is important especially for two reasons. First of all, the number of people with AS increases and may soon be a noticeable group in society, and therefore the awareness and knowledge on this subject must increase, especially among HR managers, coaches and other HR specialists. Secondly, there is no systemic solutions in Poland regarding the development of competences and the promotion of employment of people with AS. Therefore, it is necessary to start a social debate, scientific work and implementation of practical solutions in the above-mentioned range.

The article consists of three parts. In the first one, a short description of AS was presented as a disease and the situation of people with AS on the Polish labour market was described. In the second part, the scope of research was characterized. In the third part, based on the conducted research, selected guidelines for managers, HR specialists and other people cooperating with the AS or intending to start cooperation with them were presented, as well as the prospects of employing people with AS in the context of modern forms of employment.

The content of the article is to draw the attention of theoreticians and practitioners of management to the problem of AS functioning on the Polish labour market and to encourage various associations to take initiatives in this area.

Theoretical background

The name of the syndrome comes from Johann "Hans" Friedrich Karl Asperger, Austrian paediatrician and medical theorist who as a first noticed a psychological disorder which he termed "autistic psychopathy". In 1944, he described a pattern of children behaviour that included "a lack of empathy, little ability to form friendships, one-sided conversation, intense absorption in a special interest, and clumsy movements" [Asperger 1944]. Moreover, the scientist called his patients as "little professors," because of their ability to talk about their favourite subject in great detail. He was convinced that AS children can increase their unusual skills or interests and became successful employees. Unfortunately, Asperger's work was not developed until beginning of the 1980s, but later, due to his earlier work was named after him.

For the first time, Asperger syndrome was included as a formal diagnosis in 1990 at International Classification of Diseases [ICD-10] published by WHO. According to current edition of ICD-10, AS is defined as "A disorder of uncertain nosological validity, characterized by the same type of qualitative abnormalities of reciprocal social interaction that typify autism, together with a restricted, stereotyped, repetitive repertoire of interests and activities. It differs from autism primarily in the fact that there is no general delay or retardation in language or in cognitive development. This disorder is often associated with marked clumsiness. There is a strong tendency for the abnormalities to persist into adolescence and adult life. Psychotic episodes occasionally occur in early adult life" [ICD-10, 2016]. Moreover, ICD specified following, detailed diagnostic criteria for AS:

"A. A lack of any clinically significant general delay in spoken or receptive language or cognitive development. Diagnosis requires that single words should have developed by two years of age or earlier and that communicative phrases be used by three years of age or earlier. Self-help skills, adaptive behaviour and curiosity about the environment during the first three years should be at a level consistent with normal intellectual development. However, motor milestones may be somewhat delayed and motor clumsiness is usual (although not a necessary diagnostic feature). Isolated special skills, often related to abnormal preoccupations, are common, but are not required for diagnosis.

a) Qualitative abnormalities in reciprocal social interaction.

b) An unusually intense circumscribed interest or restricted, repetitive, and stereotyped patterns of behaviour, interests and activities (criteria as for autism; however, it would be less usual for these to include either motor mannerisms or preoccupations with part- objects or non-functional elements of play materials)" [ICD 1993, pp. 186–187].

Research methodology

The research described in the article was conducted from June 2017 to January 2018. In order to present the issue in a reliable manner, a number of actions were taken. First of all, the author has got acquainted with literature, studies and specialist reports as well as with legal acts concerning people with disabilities in force in Poland. An important supplement to the literature was getting to know the life stories of people with AS available in films, popular science fiction and fiction literature, whose authors have AS or whose subject matter concerns people with AS. Moreover, it was useful to familiarize with the entries on thematic internet forums and websites of foundations and associations of people with AS (in particular: Autism – Europe, Synapsis Foundation, Polish Society of Asperger Syndrome and the Prodeste Foundation). This allowed in particular to discovered the real problems of people with AS in Poland. Very important information was obtained as a result of a direct interview which was conducted in January 2018 with Izabela Broczkowska (an employee of the Synapsis Foundation). Looking for statistical data on the number of people with AS in Poland, the data provided by Central Statistical Office, The Ministry of Family, Labour and Social Policy, The Office of the Government Plenipotentiary for Disabled People, The State Fund for Rehabilitation of Disabled People and reports of non-governmental organizations were reviewed. Unfortunately, no reliable data was obtained.

Results

AS people in Poland

An important feature of both autism and AS is the fact that people affected by these diseases are characterized by different levels of dysfunction. Therefore, high, medium and low-functioning individuals are distinguished. Apart from therapeutic issues, this situation causes that people with AS (especially high-functioning): 1) are not aware that they are disable, sometimes they notice their dissimilarity, but due to the lack of common knowledge about AS, they explain it as a personality trait, temperament, the consequences of life experience or do not explain at all; 2) do not want to identify with people affected by autism; 3) may consciously avoid receiving professional diagnosis and pronouncement; 4) will not admit that they have this disease.

Due to the above, it is very difficult to reliably determine the number of people with AS, both in Poland and in the world. Of course, various governmental and non-profit organizations run their databases. Unfortunately, as mentioned above, some people with

AS do not report to above mentioned organization, because they do not want to reveal themselves, or do not know that they are disable. Another situation occurs among middle and low-functioning people, as they usually undertake professional therapy.

Based on the example of Poland, other barriers can be indicated that prevent full registration of people with AS. These include: therapeutic, legal and social barriers. Therapeutic barrier is associated with the process of taking a treatment by an AS patient. Therefore, we assume that a person with AS decides to take treatment, or does so as a result of the suggestion of someone around him. The first problem that may occur is that the doctor makes a wrong diagnosis. Analysing the statements of people with AS and their families, it was pointed out that AS is confused with depression, ADHD, neurosis, hyperactivity, and even a "youthful period of rebellion". However, if a doctor makes a correct diagnosis, it is not tantamount to putting this person in the "central / national records", because at this stage such a record does not exist. A person with AS has a diagnosis and it is up to her/him whether she or he will apply for a disability pronouncement and thus be formally registered in a centralized national database. Additional barriers to estimating the number of people with AS are associated with the disability pronouncement procedure. As in the case of diagnosis of the disease, a common problem is the low knowledge of AS among the doctors of the predicate, which in consequence may lead to the rejection of the application of the person to declare her/his disability. Another problem is related to the symbols defining the cause of disability. In Poland, this issue is regulated by *The Ordinance of the Minister of Economy, Labour and Social Policy* of July 15, 2003 on pronouncement about disability. Until 2010 the following symbols were inserted on the disability pronouncement due to AS: 01-U (mental retardation) and/or 02-P (mental illness). For this reason, many people with AS, avoiding social stigmatization and ridiculing, avoided applying for a disability pronouncement. Thanks to the initiatives of non-governmental organizations, on 1 January 2010 *The Ordinance of the Minister of Labour and Social Policy of 23 December 2009 amending the regulation on disability and disability status regulation* came into force, in which the 12-C disability symbol was added (overall developmental disorders), used in the diagnosis of AS (but not only). This did not completely solve the problem, but it softened the reception of disability. Another group of barriers concerns the social sphere, in particular the labour market. The problem underlying these barriers can be described as one: "lack of knowledge about AS". The gap concerns not only the disease itself, but its occurrence in general. This causes a number of other problems mentioned above.

As specialists note, the growing number of adolescents and adults with autism will be a challenge for social policy in the coming years [Dorociak et al. 2010]. The problems of persons with AS in Poland may be demonstrated by numerous initiatives undertaken by non-profit organizations, including the Polish Society of the Asperger Syndrome [Ca-

łek, Kwapińska 2014] or the Synapsis Foundation [*Report* 2017]. This can also be indirectly demonstrated by data of state institutions, such as the report of the Human Rights Defender in 2012, which indicates that 5947 children and youth with autism are taught in Polish schools, including AS [*Równe szanse* 2012]. Of course, the statistics do not include adults and undiagnosed people.

Suggested jobs for AS people

People with AS like any other group of people differ in many respects. In addition to differences resulting from the specificity of this type of disease, people with AS differ in knowledge, experience, interests, level of intelligence and commitment. Therefore, not all of them should be considered as geniuses, the so-called savants who are exceptions. However, it was noticed that due to the well-developed skill of logical thinking, the interest of people with AS often focuses on mathematical and natural sciences [Preißmann 2012]. In addition, people with AS often have the following skills: credibility, motivation to work, high level of technical skills, accuracy and attention to detail, good concentration during routine activities and procedures, memory for facts and numbers, logical approach to tasks, manual efficiency [*Zatrudnianie* 2008]. The most widespread set of professions suggested for people of AS was developed in 1999 by Grandin, and include i.e. computer programming, advertising and magazine layout, Web page design or accounting [Grandin 1999]. She also specified professions that they should not perform, i.e. cashier, waitress, receptionist or telephone operator [Grandin 1999]. Some people with AS who have appropriate professional qualifications and the necessary organizational and planning skills can set up their own company. It requires them (just like people without AS) to self-discipline and perseverance, assimilate the principles of social co-existence and cooperation with customers. Self-employment can be fostered by new forms of work, whose development is planned in the near future, such as: an expert for rent for the duration of the project, mobile work using ICT, voucher work (work package purchased from an intermediary organization), portfolio work (self-employed perform work for many customers), crowdworking through the platform (tasks are divided between different employees) [Włoch 2017]. The indicated types of work, especially when performed without contact with other people, arouse reservations of psychologists dealing with AS. They emphasize the threat concerning the social rehabilitation of a person and AS. Namely, a person with AS who will work at home, without having to stay in and contact with other people, will not practice social skills, and thus will deepen their deficit in this area.

Recommendations on the recruitment and selection of people with AS

In accordance with the provisions of *The Act on the Protection of Personal Data* and anti-discrimination regulations contained, inter alia, in the Labour Code, an applicant is not required to disclose information about his or her disability. It can be both an advantage and a system fault. A high-functioning person with AS without informing about the disease has the opportunity to avoid unnecessary questions and stigmatization or rejection. However, advisers and therapists of people with AS, recommend informing about their disability after all, because it gives the employer who knows the problem, the opportunity to provide adequate support [*Zatrudnianie* 2008]. Recruiting people with AS it is not necessary to use particularly sophisticated methods or techniques. If organization consciously and intentionally recruit people with AS, it should pay attention to the following matters: 1) whether the recruiter, and especially the interviewer, knows the issue of AS and related problems; 2) are managers of a company sure that learn how to manage such people to avoid conflicts and misunderstandings. In addition, it is worth taking into account the recommendations formulated by psychologists and vocational counsellors cooperating with people with AS (table 1).

Table 1. Recommendations on the recruitment and selection of people with AS

Method, technique, tool	Recommendations
Recruitment advertisement	It should not contain jargon or requirements for unnecessary qualifications
Questionnaire	It should encourage people with AS to voluntarily declare their disability
Interview	Avoid telephone calls Ask detailed questions instead of general ones Ask questions about the real experience of the candidate Avoid hypothetical and abstract questions Give the candidate more time to answer Give clear signal that the candidate is talking too long Take into account that the person with AS can take words very literally Keep in mind that a person with AS has difficulty in maintaining eye contact In the case of middle and low-functioning persons, an interview may require the presence of an accompanying person
Competency tests	Very recommended, especially the aptitude test
Psychometric tests	Useless for AS people

Source: based on [*Zatrudnianie* 2008, pp. 40–49 and Borys-Kierszniewska et al. 2012, pp. 14–17].

Special rules referring workplace

In the available literature on the subject, you can find statements from people with AS emphasizing the need for order and solid rules, rituals. They are looking for an orderly environment with transparent structures [Preißmann 2012]. It is important that in addition to personal discomfort, people with AS may respond to changes very rapidly, which may surprise unprepared colleagues. As emphasized by experts on the subject, with age, the readiness to accept small changes in everyday life increases with people with AS, especially if these experiences are positive [Preißmann 2012]. So, at the employee with AS, the features listed may be poorly noticeable. The solutions supporting good functioning of an AS person in an enterprise include: 1) defining clear rules in the scope of work organization (e.g. beginning and end of working time, rules of taking breaks at work, division of decision-making competences, dress code, place and time of eating meals, holidays, duties, etc.); 2) the existence in the organization of a person who is an "assistant, mentor, trainer" of a person with AS; this person should, of course, have knowledge and experience in the field of AS; the support used should be withdrawn over time; 3) place of tranquillity and relaxation; 4) conducting a specialized process of professional adaptation and employee observation during the trial period; 5) care for ergonomic and occupational hygiene conditions that do not distract attention (acoustics, lighting, etc.); 6) spatial visualization of rooms (clear and legible marking).

Recommendations for managers and co-workers

Social interactions require different skills that a healthy person possesses and uses without having to learn them consciously. It is different in the case of people with AS who, willing to function effectively in the environment must undergo special training in social skills. Coming with other people is for people with AS the most stressful situation they can imagine. As a consequence, many of them retreat from active life and avoid social contacts, concentrating all their attention on their interests to relax [Preißmann 2012]. The basic problem of people with AS is therefore both verbal and non-verbal communication. These people often literally understand idiomatic phrases, proverbs and jokes, speak in a steady tone or too loudly, eye contact with them is restricted. These people seem to be devoid of emotions, which also creates barriers to communication. It is also important to be aware that the symptoms of overloading situations in people with AS can be very diverse and take such forms as headache or dull pressure in the head, dizziness, nausea (with or without vomiting), lack of strength in the members, anxiety, hesitation mood, depression and, moreover, the often repeated feeling that it is impossible to

endure in a given situation, sometimes even the fear of such a state and the impression of an unspecified threat [Preißmann 2012].

Table 2. Selected principles improving management and cooperation with people with AS

Category	Suggestion
Communication	Deprived of assumptions, direct, precise, simple, avoiding figuratively, detailed, expressing respect
Forms of communications	Preferred written and graphical Verbal reinforced with a written message
Setting tasks	Explain the purpose of the task, Explain all stages of the task, Specify the expected result or final product Inform about the expected quality Specify the task execution time interval Check if the command has been understood Feedback after completing the task
Changes	Any change in the organization of work should be preceded by an explanation and proper preparation

Source: based on [Zatrudnianie 2008].

Discussion

The growing trend of the number of people with AS in the world also occurs in Poland. Therefore, it is necessary to activate initiatives in Poland aimed at implementing solutions and good practices from countries that have been supporting people with AS for a long time, such as the United Kingdom, where over 250 000 people with AS live [*Zatrudnianie* 2008, p. 11]. The guidelines of organizations such as The National Autistic Society or Autism – Europe should also be used. In addition, in cooperation with Polish organizations associated under the Autism – Poland Agreement, knowledge about AS should be propagated, especially among professionals in the field of career counselling and human resource management (employment agencies, employees of HR departments in enterprises, etc.). From the point of view of the organization, adjusting the workplace does not require radical and costly changes. Most modern enterprises are already designing their offices taking care of the ergonomic principles of the work environment, including quiet and team work zones, conferences as well as entertainment and rest areas. Also, the requirements for communicating with an AS person, presented above, do not seem to differ from those commonly required of managers. However, various studies show that internal communication is still one of the least appreciated and developed competences in enterprises, which causes a number of conflicts, misunderstandings and sometimes

organizational pathologies. In the case of people with AS, bad communication makes their work impossible or very difficult.

Ethical aspects of employing people with AS are also necessary to consider, including the protection of information about disease (disclose or not disclose), stigmatization and discrimination. The person interviewed for the purpose of this study, among other things, pointed to the following business problem: some US and Spanish companies in which it is fashionable and beneficial to present the company as a CSR promoter, employ disabled people (including people with AS) and they boast of it as a manifestation of their "openness, tolerance and commitment to CSR". People with disabilities, especially those whose disability is concealed, do not want to be treated as the "object of the business image campaign". On the other hand, enterprises reported that although there are legal and financial solutions creating a favourable atmosphere for employing people with disabilities, they are afraid that if a disabled person does not perform the tasks entrusted to her/him properly, it will be difficult to dismiss this person, not for legal reasons, but just image-related (it's easy to accuse a company of discrimination). This is not an unfounded fear. As the specialists dealing with disabled people also state, they often show a claiming attitude. It should be remembered that the majority of people with disabilities, however, want to work and develop.

Conclusion

The conducted research allowed to note the growing problem of the necessity of professional activation of people with AS and adaptation of enterprises to cooperate with such persons. The basic organizational solutions that should be implemented in order to effectively cooperate with people with AS are indicated. The sources of knowledge on good practices, that should be used to undertake further research and work related to the issue of AS in Poland, were provided. The research described in the article was of a pilot nature and concerned the preliminary diagnosis of the occurrence of the phenomenon. The necessity of conducting in-depth tests in enterprises and organizations dealing with HR has been demonstrated. Above all, however, attention is drawn to the need for public debate and activities involving the dissemination of knowledge about AS.

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Pillars of Creating Sustainable Personnel in an Organization

Abstract: Sustainable personnel, and that means the one that knows, understands and, above all, applies the principles of sustainable development in their work, is to be sensitive to economic, ecological and social problems appearing in the global economy. In order to meet these needs, it seems to be indispensable to search for the ways to provide organizations with human resources (employees) that meet the sustainability criteria. The objective of this article is to present the development of the sustainability concept and to indicate a role of the sustainable human resources management in creating sustainable enterprises. The study has explained the essence of the sustainable human resources management, which shapes the area of the knowledge. This area could significantly accelerate the transformation of the consumer societies (employees) into the socially (employees) sustainable. In this context, the important element has become the search for an answer to the question on how to create personnel in the organization, corresponding to the requirements by sustainable development. The article has based on the systematic text review method of text sources and their synthesis [Czakon 2013]. This allowed to indicate the relevance of the topic and the need to take it.
Key words: sustainable development, sustainable management, sustainable human resources management, sustainable personnel

Introduction

The ongoing globalization of the economy, demographic growth and the high level of economic activity, are some of the principal reasons of ecological problems, which occur more and more frequently in the world. In order to satisfy the ever-growing needs, a man transforms the natural environment, uses more and more of natural food, water

and energy, while simultaneously contributing to the release of harmful gases and chemicals, which, in the light of the ever-increasing population of the world, and, therefore, of consumption, is a feature of a development which is not permanent. Taking under consideration the organizational context, the influence exerted by enterprises upon the natural environment results from the selection of raw materials, suppliers, land use, production processes (the production of waste and pollution), selected organizational structures, management systems, employment and information use. For that very reason, the creation of sustainable development has to entail, first and foremost, changes in enterprises, including changes in human resource management. It is human resources management in the organization which affects individuals and groups, as well as all organizational entities in order to showcase balanced attitudes and behaviours [Jackson et al. 2011]. In order to face these problems, it is important to firstly make the societies (employees) aware of the threats which result from such resource management, and secondly, to implement measures to prevent wastage; to put it in a nutshell, the creation of sustainable enterprises through the implementation of sustainable management based upon sustainable personnel activities. On the other hand, taking under consideration the changes taking place in traditional thinking about human resources management, as well as in connection with the necessity of strategic human resources management expansion, sustainable human resources management may constitute an alternative to organizational success.

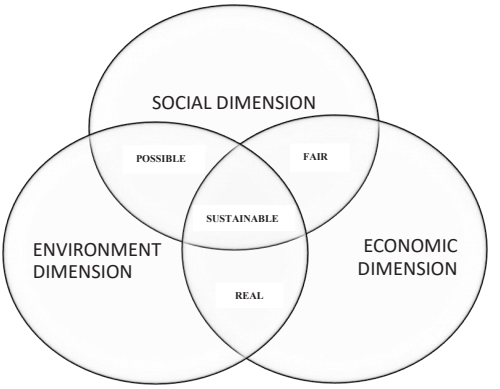
Foundations of sustainable development

Environmental problems were the foundations for defining the conception of sustainable development by the UN World Environment and Development Commission in 1987. In accordance with the findings of this body, sustainable development is "a process the objective of which is to satisfy the developmental aspirations of the present generation, in a manner enabling the same aspirations to be pursued by the future generations" [World Commission on Environment and Development 1987, p. 37]. Taking under consideration long-term ecological strategies, the objective was to introduce such a philosophy of sustainable development which would integrate economic and ecological objectives with social objectives in the context of fair opportunities for sharing resources for the present and future generations.

Therefore, propagated sustainable development operates under a three-dimensional aegis (fig. 1). The first of them is the social dimension, where sustainable development contributes to the improvement of living conditions (health) and the development of individual achievements and personal fulfilment, reduction of social inequalities, as

well as to the use of cultural and historical specific character of various social groups. In the case of the second dimension, namely the environmental one, sustainable development determines the preservation of natural resources, the quality of the environment, and of biodiversity. In accordance with the last, economic, dimension, the task of sustainable development is to ensure long-term economic growth based upon technology, real estate or funds, etc. [Vidrascu 2015]. The introduction of sustainable development has to be based upon ethical foundations consistent with the principles of intergenerational equality, justice, risk minimization, harmony with the environment, and, simultaneously, it has to be possible and real [Kośmicki 2010].

Figure 1. Dimensions of sustainable development



Source: based on [Vidrascu 2015].

Since the UN Commission's findings, the conception of sustainable development has been discussed in the course of the First Earth Summit in Rio de Janeiro in 1992, followed by those in Kyoto (in 1997) and in The Hague (in 2000). The topic is also current today, principally in connection with the European Union strategy "Europe 2020. A strategy for smart, sustainable and inclusive growth" (fig. 2)[1]. In addition to the environmental protection priorities mentioned in the document, the principal objective of the activity is the social factor, also referred to as human resources, including increasing the employment rate of people at the age between 20 and 64, reducing the number of early

[1] The Strategy constitutes a long-term programme of social and economic development of the European Union, the implementation of which is anticipated to take place between 2010 and 2020, which was approved of by the Council of Europe on 17th June, 2010.

school-leavers, increasing the proportion of people at the age between 30 and 34 with tertiary education and limiting the number of people living in Europe below the poverty line [European Commission Communication 2010].

Figure 2. Priorities of the strategy „Europe 2020"

Source: own work.

It follows from the above that the implementation of actions towards the sustainable development of personnel is required both by the governments (taking under consideration the human resource understood as the citizens of the country) and enterprises (and that means their employees).

As noted in her report, I. Ehnert [2016], in response to the growing public awareness about the importance of organizational contribution to sustainable development, corporations have an increased incentive to report their sustainability efforts. The main influence on the reporting of such practices is the origin of the country, the headquarters of the organization.

From sustainable development to sustainable human resource management

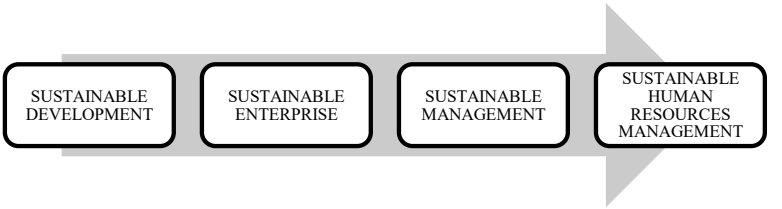
The introduction of the conception of sustainable development and meeting the expectations it faces at the global level requires the application of the principles of sustainable development at the national, regional, local and business level.

Organizations which can be referred to as sustainable enterprises are these which respect the principles of sustainable development in their activities, with the proviso that the implementation of the adopted objectives of sustainable development is possible, principally, thanks to the employees of the organization. This is the level where most of the issues connected with the use of resources, ecological and social activities are resolved. As you know, enterprises acting upon the basis of management functions (planning, organizing, motivating, controlling and developing) define the objectives of their operations. Moreover, in connection with sustainable development, these functions are the essential elements of the organization, hence we are talking about the need of the implementation of sustainable management [Pabian 2011]. From this point of view, the appropriate management strategy ought to include all three dimensions: social, economic and environmental, while taking under consideration that the processes connected with the introduction and the maintenance of balance are interrelated, and, therefore, the balance of one of them does not guarantee balance in other areas. In accordance with the opinion of W. Przychodzeń, in a sustainable enterprise, the activity in the social area is based upon the conception of Corporate Social Responsibility, in the environmental area it involves minimizing ecological burdens, and from the economic perspective it ought to lead to stabilization in the area of financial and operational policy [Przychodzeń 2013]. When transferring the objectives of sustainable development to the organizational area, attention ought to be paid to the need of treating all three of its dimensions equally when making decisions affecting its success. At the corporate level, the conception of sustainable development can be considered in the following aspects [Grudzewski, Hejduk 2011]:

1. as the ability to act in a hyperdynamic environment,
2. as the ability to renew and use the environmental conditions,
3. as the capability of constant learning, development, renewal and transformation, in order to maintain the position on the market while balancing the needs of stakeholders.

We ought to bear in mind that in order to achieve sustainable development at the corporate level, all existing systems in the organization ought to be concentrated on sustainable development. This allows an attempt to discuss the relationship between sustainable development and various systems which exist in an enterprise, including the human resource management system. Considering the historical evolution of human resources connected with the changes constantly occurring in the environment, a new paradigm, that of sustainable development, was bound to appear in this area as well (fig. 3).

Figure 3. From sustainable development to sustainable human resources management



Source: own work.

The dialogue on sustainable development in human resources management was commenced with the discussion on "sustainable work systems" (SWS), which dealt with the issue of sustainable development at the level of individual workplaces [Docherty et al. 2002]. In accordance with the opinion of M.R. Vickers [2005], human resources management is an organizational function which presents the greatest potential in the inclusion of thinking based upon sustainable development at the organizational level. He arrives at the conclusion, that in this way, the continuity of human resources management evolution can be proposed (fig. 4). 'Sustainable development', treated as a new step in the evolution of human resource management, possesses this continuity. The mere adaptation of strategic human resources management to the economic results of the organization is no longer enough, and the need for sustainable human resources management results from the need of supporting more sustainable enterprises, their good results in economic, social and environmental activities [Cesar et al. 2011]. According to I. Ehnert and W. Harry [2012, p. 236], human resources management has could play an important role in the implementing the "way of thinking about sustainable development" in the business organizations.

In order to understand the idea and directions of sustainable human resources management better, a review of the scientific literature in the aspect of the definition of the issue has been made. Selected definitions are presented in Table 1.

Table 1. Definitions of sustainable human resources management

AUTHOR	YEAR	DEFINITION
Zaugg *et al*.	2001	long-term recruitment, socially and economically effective, as well as the development of employees
Thom & Zaugg	2004	long-term, action-based activities the objective of which is the conscientious and profitable recruitment and selection, development and operation, allocation, but also dismissal of employees
Ulrich&Brockbank,	2005	activities the objective of which is to create value for stakeholders

AUTHOR	YEAR	DEFINITION
Ehnert	2009	a model of planned or emerging human resources strategies and practices which are to enable organizational objectives to be achieved, while recreating the human resources base for a long period of time controlling the induced feedback effects of human resources systems based upon human resources
Weissenrieder & Kosel	2011	orientation of human and personnel work on the company's goals in the long-term perspective, and at the same time not on the optimization of costs, but building in the long-term the human potential of a successful enterprise
Kramar	2014	a model of planned or emerging human resources strategies and practices the objective of which is to make it possible to achieve financial, social and environmental objectives. The objective of that is to minimize the negative influence exerted upon the natural environment, and upon people and communities; recognizes the key executive role of general managers, middle and senior human resources management managers as well as specialists and employees in providing consistent information.
Pocztowski	2016	the need of searching for and implement sustainable innovative solutions, taking under consideration the social, ecological and efficiency dimensions with an emphasis on the subjective treatment of employees, Corporate Social Responsibility activities, strengthening confidence in work processes and developing effective work systems
Kennedy	2017	management and leadership philosophy concerning the possibilities of contributing to the organization's success by minimizing the negative influence of its activities exerted by them upon environmental and social factors while improving financial factors.

Source: own work upon the basis of: [Ehnert 2009; Kramar 2014; Zaugg et al. 2001;Thom, Zaugg 2004; Ulrich, Brockbank 2005; Pocztowski 2016; Kennedy, Lakshmi 2017; Weissenrieder, Kosel 2010].

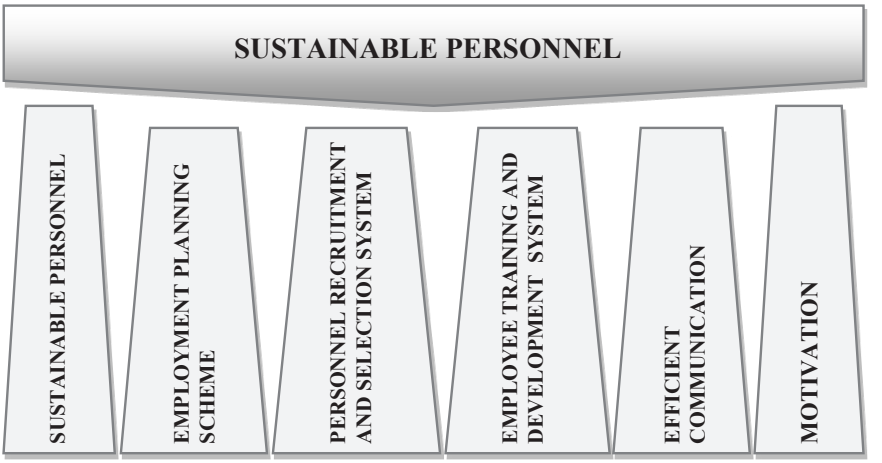
Following the fact that human resources management is both a means and a goal to achieve strategic organizational objectives, S. Taylor, J. Osland and C.P. Egri [2012] present two types of arguments why sustainability is important for human resources management. First of all, human resource management helps to manage employee attitudes and actions to achieve sustainable development objectives (human resource management is treated as means to achieve objectives). Secondly, the principles of sustainable development can be included in human resource management systems, which constitute the long-term physical, social and economic well-being of employees [Stankeviciute, Savaneviciene 2013].

Pillars of sustainable development of personnel

In order to achieve the sustainable development model in all its important components: economic, socio-cultural and environmental, it is required to have adequate human capital and to define its development trends in the medium and long term [Ciobotaru, Angheluta 2014]. The very cycle of developing sustainable personnel in a company, and that

means developing personnel that understand processes and principles connected with sustainable development, is not simple and requires both time and financial outlay. Its creation has to be based upon the following pillars: sustainable employees, the personnel recruitment and selection system, the employee training and development system [Pabian 2011], the employment planning scheme, employee motivation programmes, effective communication (fig. 4).

Figure 4. Pillars of sustainable human resources in an organization



Source: own work.

On similar assumptions, it was based already in the 2001 report by R.J. Zaugg. He has claimed that sustainable human resource management can only be implemented if it is based on the individual responsibility of employees and it is also directed to the future. It has been defined by methodological and instrumental approaches aimed at long-term, socially responsible and economically effective recruitments, trainings, retentions and employment of employees.

If the intention of an organization is to balance human resources partially or completely and to prepare a strategic plan in this regard, the following issues ought to be considered: [Pabian 2017, p. 344]:

1. what features ought sustainable personnel to possess?
2. what areas of activity ought to characterize sustainable personnel in an enterprise?
3. how to acquire personnel with the required characteristics and areas of activity?
4. how to transform employees in a company into sustainable personnel?

The condition of implementation of a management system based upon the sustainable principles in an organization, is them being accepted by all employees that will be the executors of the newly adopted strategy. The implementation of the principles of sustainable development obliges both employees and the organization itself to become involved in this process. For the former, it is associated with an increase in cognitive activity and a change in behavioural patterns, and for the latter it is connected with incurring additional costs, for instance, in the area of training and bearing the risk of failures. This, of course, requires effective communication allowing both the transfer of new ideas and the elimination of the emerging doubts [Kowalczyk 2011]. Other elements conditioning the creation of sustainable personnel in the organization are presented in Table 2.

Table 2. Characteristics of pillars of the creation of sustainable personnel in an organization

PILLAR	JUSTIFICATION	CHARACTERISTICS OF ACTIVITIES
EMPLOYMENT PLANS	In terms of implementing sustainable human resources in an organization, it is indispensable to prepare employee acquisition and training plans, as well as motivational actions. It is also indispensable to optimize plans taking under consideration, for instance, time required for the recruitment, allocation or retraining of personnel.	1) development of a vision for the sustainable development of personnel, 2) preparation of strategic programs in the field of the creation of sustainable personnel, 3) choosing one of the strategies ensuring the right number and type of employees with sustainable orientation: • full transformation, • gradual transformation, 4) securing funds for the development of resources towards sustainable management, 5) the creation of information flow systems, 6) analysis and description of workplaces in terms of compliance with the principles of sustainable development, 7) preparation of appropriate competence profiles
EMPLOYEE RECRUITMENT AND SELECTION	In connection with the progressing changes in the conception of sustainable human resources management, it becomes indispensable in the organizations to shape new competencies and to manage talents and knowledge among employees. This entails indispensable changes in the training and improvement systems towards a team learning process focused on shaping attitudes and involvement in the organization.	1) preparation of an appropriate set of questions to conduct interviews verifying the candidates' attitudes, 2) selecting candidates with pro-ecological and pro-social attitude, 3) accepting employees with high development potential, 4) employing pre-prepared workers (with some experience) to implement sustainable strategies

PILLAR	JUSTIFICATION	CHARACTERISTICS OF ACTIVITIES
EMPLOYEE TRAINING AND DEVELOPMENT	Training forms the basis for the implementation of strategies adopted by the company, including the implementation of sustainable development. They are an alternative way to acquire sustainable personnel, especially in a situation when the rapid exchange of personnel is not possible due to practical and financial reasons.	1) determining training needs, 2) directing employees to post-graduate studies and trainings outside the workplace and at the workplace, 3) assigning trainers or moderators to the employees, who are oriented at sustainable development
MOTIVATION	Effective motivation can lead to the widespread and long-term involvement of employees in social and ecological activities.	1) managers and directors provide the instances of appropriate behaviours, 2) the introduction of a motivational system for employees to disseminate social and environmental initiatives, 3) the preparation of instruments affecting the sustainable behaviour of employees, especially in the following relations: 4) • employee – enterprise, 5) • employee – supervisor, 6) • employee – work station
SUSTAINABLE PERSONNEL	The main benefits of functioning in the organization of sustainable personnel are: • decrease in the company's operating costs, • the reduction of harmful human impact on the environment, • the elimination of the wastage of production factors, • increasing the employee awareness of ecological activities, • increasing work efficiency.	Sustainable personnel is featured by: 1) knowledge about the state of socio-ecological threats and ways to counteract them, 2) sensitivity and reaction to problems in this area, 3) innovation in methods of rational resource management, 4) openness to new technologies and the suggestions of rational production and consumption, 5) activity and reaction to existing environmental and social problems, 6) initiating changes in the equipment and the workplace environment, or the way the work is done.

Source: own work upon the basis of: Oczkowska 2014; Pabian 2011; 2016; [Hilarowicz 2015].

The activities enumerated in Table 2, undertaken at the functional level of the activity of an enterprise, may significantly contribute to developing personnel following the principles of sustainable development. It is significant to take under consideration sustainable issues at each and every stage: both that of planning, and the recruitment or training personnel. Providing an appropriate information and motivational system constitute affective human resources management tools, and they matter a lot in terms of the discussed conception as well. It is worth pointing out that omitting one of the above-mentioned elements may result in a failure while implementing the conception of sustainable.

Conclusion

The conducted analysis of the literature makes it clear that there is on-going evolution of the conception of sustainable development in all the aspects of it, including, as well, that of personnel. Sustainable development is an organizational issue that requires translation into specific short- and long-term activities within not only the state, but institutional and social. These activities have to be permanent changes in the many areas, that the constant need to revitalize the subject. In order to make the implemented changes effective, the good will and involvement of both personnel and an organization are indispensable. It also ought to be remembered that a particular responsibility for implementing the ideas and the principles of sustainable development is that of managers and executives. In order to determine the direction of their activities, it seems, therefore, to be indispensable to define the basis (pillars) first of building sustainable personnel, taking under consideration the benefits and threats, and also the profile of these activities. It is indispensable as well to strive to understand the conception of sustainable development itself better, and also to raise the awareness and responsibility for the environment and the further development of civilization.

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Organisational Culture as Factor Determining the Level of Trust in an Organisation

Abstract: The first purpose of the paper was to present the results of author's own empirical research devoted to assessing the present and expected organisational culture model in Polish SME sector employees' opinion. Another key research objective was to assess occurrence of some statistically significant dependencies between the declared model of the organisational culture and the perception of the present level of respondents' trust in relation to their line managers and colleagues. Two research tools were used in the research process: the Organisational Culture Assessment Instrument (OCAI) by Cameron and Quinn and the author's own questionnaire to assess occurrence and intensity of any dysfunctional phenomena at the work place[1]. Statistical analyses of significant differences between variables were conducted with Pearson's chi square test of independence. As a result of analysing the factual material gathered during the research, it became clear that a model of the organisational culture does not have a statistically significant impact on the level of trust in colleagues while it affects trust towards line managers in all types of analysed enterprises.

Key words: determinant, organizational culture, SME sector, model, trust

[1] This paper presents only a small portion of rich factographic material gathered as a result of running a project entitled: "Organisational Culture Models Versus Workplace Pathologies." The lack of trust has been treated as the one of 29 possible dysfunctions.

Introduction

As claimed by Sprenger [2011, p. 12] trust is an extremely passionate issue since it is related to many aspects of the economy: with facilities and contracts entered into, with the shape given to relationships, with collaboration and management, with the concept of the economy of speed, innovation, credibility and commitment. For this reason, trust is one of the three–next to power and money–powerful factors of enterprise management. Confirmation of the above–quoted opinion can be also found in views of other authors who claim that the ability to shape, develop and rebuild trust in everyone: clients, business partners, investors and colleagues–is the key leadership competence in the conditions of new global economy [Covey, Merrill 2013]. Unfortunately, in spite of the great importance attributed to the role of trust in business dealings, the world struggles with a global crisis of trust: "Once successfully out of the global financial crisis, enterprises and organisations worldwide found themselves in a crisis which is much deeper and more destructive. It is the crisis of trust. The progressing erosion is a major issue in countries whose prosperity depends on the rapid growth and creative spirit, so cherished in capitalism. It is a particularly difficult challenge for companies whose activity is based on a daily exchange of proofs of trust with clients, consumers, stakeholders or shareholders (...). Trust is like air we breathe – if we have it enough no one notices it but we all start to see it when it's lacking" [Covey, Link, Merrill 2013].

Trust is an incredibly inspiring research category displaying many new fields of scientific exploration. The key objective of this paper was to expose the role of the organisational culture as the determinant of the level of trust inside an organisation, with a particular emphasis on the level of trust in colleagues and line managers. To achieve the above–described objective, the author carried out self–designed empirical research to answer a number of leading questions:

- What is the existing model of an organisational culture in the analysed enterprises, considering their size?
- What model of an organisational culture is declared ideal/desirable by employees?
- Are there any convergences or divergences in assessing respondents' preferences as to the existing and their desirable model of organisational culture in enterprises of different sizes?
- Is there any statistical dependence between models or the organisational culture, declared as the currently existing in individual types of enterprises and the level of trust that respondents have in their colleagues?
- Is there any statistical dependence between models or the organisational culture, declared as the currently existing in individual types of enterprises and the level of trust that respondents have in their line managers?

The presented dependencies were referred, separately, to microenterprises, small, medium-sized and large enterprises.

Organisational culture – ambiguity of the notion

Organisational culture is one of the scientific categories which causes a great deal of trouble to researchers. Occasionally, it is called "personality of an organisation", "the philosophy which drives the policy of an organisation", "the core of values which define the philosophy or mission of a company", "customary and traditional ways of thinking and acting", "the organisational climate", "symbols, language, ideologies, rituals, myths", "values, standards, knowledge", "patterns of thought processes" and "speech or jargon" [Zbiegień-Maciąg 1999, p. 17; Srokowski 2011, p. 26; La Montagne 2016, p. 9; Wudarzewski 2013, pp. 59–78]. It is also called "the tool of domination and oppression, hyposthasy and ideology, a pseudoscientific component and fashion or even a mental prison [Sułkowski 2011] as well as "one of the main sources of pathology in social behaviour" [Tarnowska 2011, p. 74].

Ambiguity of definitions, which arise from renewed attempts at defining what the organisational culture does not facilitate understanding of its essence by business practitioners, often resulting in a choice of an attitude manifesting total ignorance of its importance. However, the attitude is a loss of a number of advantages. Many authors claim that the organisational culture does not leave desired performance of people and enterprises unaffected [Neagu, Nicula 2012; Weare, Lichterman, Esparza 2014]. Rules of conduct, standards and values arising from the organisational culture determine both the effectiveness for formulating the company's strategy, effectiveness of change management processes as well as the effectiveness of motivational processes [Altaf 2011; Harrington, Voehl 2015], also the level of trust [Dani, Burns, Bachhouse, Kochnar 2006; Lewicka 2012]. Organisational culture preserves motives of organisational behaviours. An adequately strong culture may well stimulate employees to creativity and innovation, it may also encourage them to take risk [Saad, Asaad 2015]. Employees who share values and behavioural standards as well as conduct and ways of thinking preferred by a culture will be, to a largest extent, identified with enterprises for which they work, more engaged in solving its problems. The organisational culture model existing in an organisation may then substantially support effectiveness of management in the organisation and its employees but it may also effectively disrupt the organisation [Eaton, Kilby 2015; Harrington, Voehl 2015; La Montagne 2016]. It is interesting whether the organisational culture determines also the level of employee trust in their line managers and colleagues in SME sector, what the author perceives as gap research. This has been the subject of the proprietary research whose results are presented in this article.

Trust – complexities of interpretation

Trust is a broad concept encompassing both internal trust (trust between colleagues, trust between employees and managers, trust in IT) and external trust (in vendors, business partners, etc.) [Zhang, Tsui, Song, Li, Jia 2008]. In the literature, other types of trust are also mentioned e.g. vertical, horizontal, system–related, structural, large, small, personal, positional, commercial, emotional and knowledge–related [Bugdol 2010; Tan, Tan 2000; Wziątek–Staśko, Lewicka 2008]. The number of categories is extensive, but it is not the range of categories which is the concern here. The point is to define trust and explain potential consequences of its erosion [Sousa-Lima, Caetano 2013]. Sprenger, a German management guru, observes a rather intriguing rule: "(...) I haven't met a manager who wouldn't consider trust the key element in dealings with employees. I haven't met a single speaker who would not claim that trust is the key to setting value and performance orientation for enterprise policy. What is more, I haven't read a management manual which wouldn't explain all potentially achievable positive financial effects through the prism of trust. But I haven't met a single person who could explain to me what trust really is" [Sprenger 2011, p. 9]. The author emphasises that "the deficit of knowledge about the essence of trust comes from the fact that, so far, they were considered factors explaining the cooperative attitude and not a phenomenon that required to be explained. The above shows that trust was treated as explanans (a factor explaining a described phenomenon) and not as explanandum (a factor or a phenomenon being explained). And both have as much in common as a mole in the chin and a mole digging in the soil". The above–mentioned author, in his effort to understand the essence of trust, asks many intriguing questions: "What is trust then? What is it all about? Is it an impression, a moral attitude, a whim dating back to all good times, a fashionable term from the field of enterprise management, a common stereotype about a problem-solving method, a rhetorical trick which helps to disclose the power ruling technique to camouflaging geniuses, a magic charm preventing getting into some dangerous gear or perhaps a contribution to a motivational blabla assisting the sphere of our professional work as a fly which persistently accompanies a grazing cow?" [Sprenger 2011, pp. 9–11]. Similar views are also expressed by other authors who claim that, in daily practice of enterprises, the notion of "trust" remains a slogan said with conceit, arrogance and in expectation of an applause but, at the same time, aimed at evoking the feeling of guilt in those who have not been yet showing trust in their environment. The word "trust" tends to be thrown when something important in an enterprise does not function as it should [Hawley 2014; Acedo, Gomila 2013; Campellone, Kring 2013; Colledge, Morgan, Tench 2014]. Trust occupies an increasingly prominent position in the area of interest for management sciences. Currently, the notion is mentioned when debating new enterprise management paradigms and

the role of its intangible asset components. Trust gains particular importance in the context of changes occurring in the environment of contemporary organisations, in the era Web 2.0+. Transforming world and potential global scale co-operation with the support of the cloud, e-communication, e-commerce, e-leadership, e-recruitment and selection, e-resources, e-business, continue to trigger immense care about such delicate and subtle phenomenon as trust [Wziątek-Staśko 2016; Żądło 2014; Malthotra, Lumineau 2011]. According to Paliszkiewicz [2013, pp. 162–163], the nature of trust is overwhelming and penetrates all human activities, it is a component of his entire life experience. The importance of trust for organisation's success cannot be undermined. It is necessary when facing immense multitude of meanings, uncertainty, complexity (...). It affects innovative actions and supports innovation. It is an important element of collaboration, it develops and sustains it as it promotes exchange of information, enriches relations, causes growing openness and mutual acceptance, supports conflict-solving. Trust has a huge impact on joy of teams and organisations defined as employee satisfaction and capacity of an enterprise to attract and keep talents [Ji, Zhou, Li, Yan 2015; Sellaro, Hommel, De Kwaadsteniet, Van de Groep, Cozato 2014]. Bugdol [2010, p. 130] claims that "trust is a long-term investments". Unfortunately, many contemporary enterprises are inexhaustible layers of suspicion. Deeply rooted distrust which tries to put on a mask of reason turns top managers into order keepers and managers into policemen patrolling their district (...). Lack of trust is a poison which paralyses everyone [Sprenger 2011, p. 25; Lu, 2014].

Research objective and methods applied

The author's own empirical research was aimed at evaluating the existing and desirable model of the organisational culture in the opinion of Polish employees. It was interesting to verify whether such model is dependent on the size of the enterprise: micro (less than 10 employees), small (10–49), medium (50–249), and also large (250 and more). Another research objective was to assess occurrence of some statistically significant dependencies between the declared model of the organisational structure and the level of employees' trust in relation to their superiors and colleagues. Two research tools were used in the research process:

- the Organisational Culture Assessment Instrument (OCAI) by Cameron and Quinn [Cameron, Quinn 2003];
- the author's own questionnaire to assess occurrence and intensity of any dysfunctional phenomena at the work place, including the present level of trust (29 questions followed by the respondents' characteristics).

Statistical analysis of significant differences between variables were conducted with Pearson's chi square test of independence. A significance level of $\alpha = 0.05$ was assumed for the test.

Anonymous empirical research on a randomly selected sample of respondents from the Silesian Region was run from April 1, 2016 to November 30, 2016, with the paper (hard) copy of both research instruments. In total, 700 copies of questionnaires were handed out to respondents; 664 complete and correctly filled out forms qualified to be analysed eventually. The structure of respondents is presented in table 1.

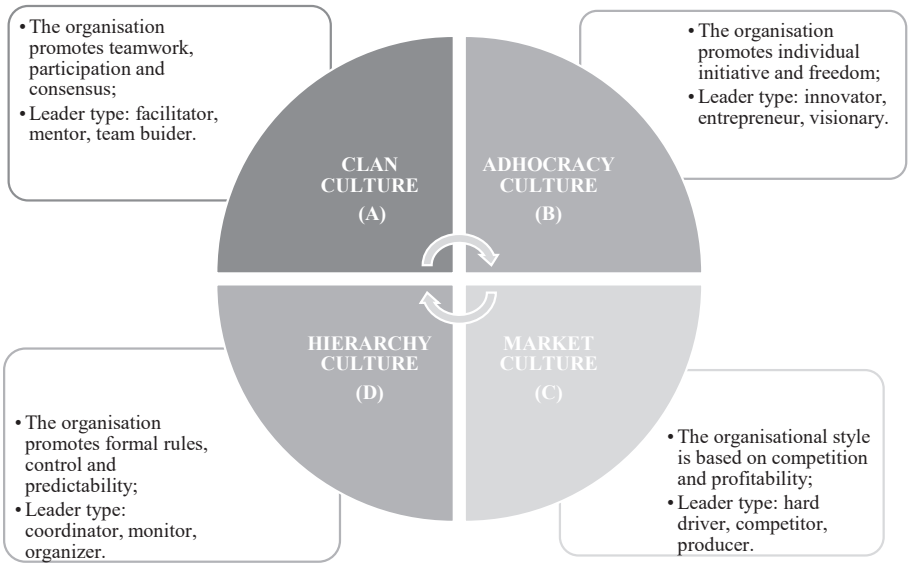
Table 1. The respondents' characteristics

The respondent's characteristic		Respondents in numbers *(N)*	Respondents in percent (%)
Sex:	women	347	52.2
	men	317	47.8
Age:	18-25	337	50.8
	26-35	170	25.6
	36-45	124	18.7
	46-55	30	4.5
	55 and more	3	0.5
Education:	elementary	1	0.15
	vocational	6	0.9
	high	530	79.8
	university	126	19.0
	academic/scientific	1	0.15
Position:	blue collar workers	246	37.0
	non-blue collar workers with no managerial responsibilities	296	44.6
	lower level managers	31	4.7
	medium level managers	71	10.7
	top level managers	20	3.0
Work experience:	less than 5 years	328	49.4
	5-15 years	202	30.4
	more than 15 years	134	20.2
Sector:	private	526	79.2
	state	117	17.6
	third sector	2	3.2
Enterprise size:	micro	99	15.0
	small	127	19.1
	medium	152	22.9
	large	286	43.0

Source: own study.

The model of the organisational culture used for researching for the purpose of this paper is the Competing Values Framework developed by Cameron and Quinn, presented in figure 1.

Figure 1. Competing Values Framework developed by Cameron and Quinn



Source: own study based on: Cameron, Quinn 2003.

Research results presentation

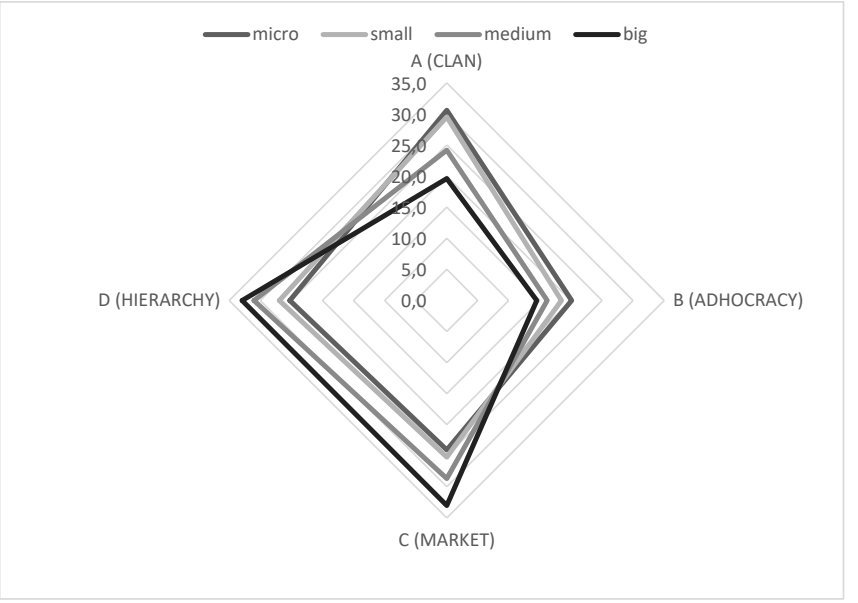
The first goal of the research was to diagnose the type of the organisational culture predominant in the organisations employing respondents. The "current" and "desirable' models of the organisational culture were identified with OCAI Questionnaire developed by Cameron and Quinn. The factographic material for the issue discussed in this part of the paper is presented in figure 2 and figure 3.

According to the data in figure 2, the models of cultures, indicated by respondents as those existing currently, are different depending on the type of enterprise they apply to. In micro– and small enterprises, the clan culture ranked as the dominant model

of culture (30.6% and 29.5%), the hierarchy culture in medium-sized enterprises (31.0%) and the market culture in large enterprises (also covered by the research for the sake of comparison (33.0%). Preferences as to the model of the organisational culture indicated by respondents as their "desirable" model are presented in figure 3.

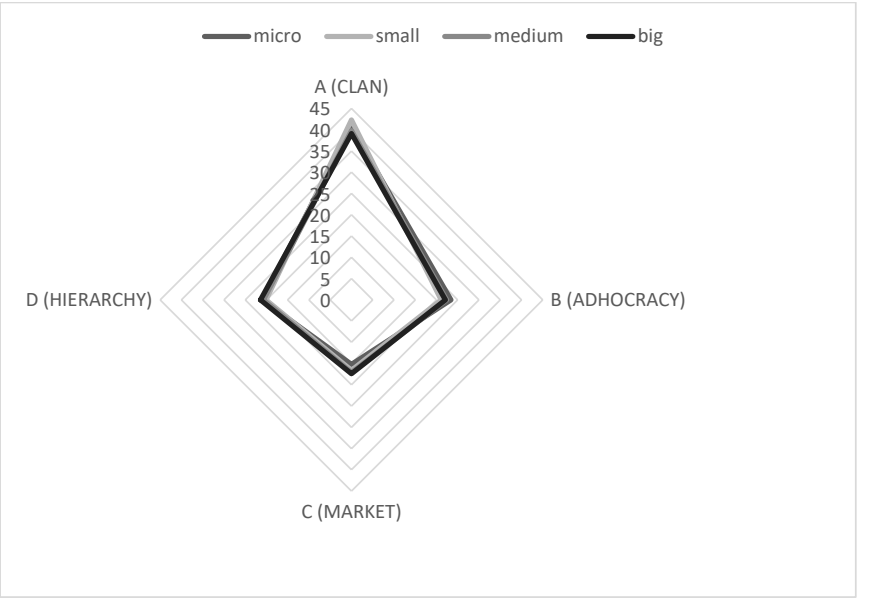
The picture presented on the figure 3 reflects a very interesting condition–according to the majority of respondents, the most desirable model of organisational culture, irrespective of the size of their organisation, turned out to be the clan culture (above 39.0%) and the least desirable was the market culture (at 17%). The discrepancy seems rather significant. Preferences for the other two models of culture ranged between (21.0% –22.0%). In this case, respondents' opinions seem astonishingly consistent.

Figure 2. The existing organisational culture model in micro, small, medium and big enterprises



Source: own analysis.

Figure 3. The expected organisational culture model in micro, small, medium and big enterprises



Source: own analysis.

Therefore, when answering question number two: "Does the size of an enterprise have an impact on differences in evaluation of the current and desirable model of organisational culture by respondents?", note that, when evaluating the "current" model, a difference was noticeable while in case of preferences for the "desirable" model, such differences were practically not identified.

The second research goal was to check whether the model of the organisational culture, declared as the currently existing, affect the level of trust in line managers and colleagues, declared by respondents, considering the size of an organisation. For the purpose of diagnosing the level of trust, respondents used Likert's scale (1 to 5, where 1 indicated their critically low level of their trust, 5– very high level of trust and 2 to 4– average levels). Presented below are the conclusions from the author's analysis of the data collected in the research:

- There is no statistically significant dependency between the following research categories: "the model of the organisational culture currently existing in the organisation" and "the level of trust in colleagues subjectively experienced by respondents". The results are presented in table 2.

Table 2. Level of trust in colleagues and the organisational culture model–the results of Pearson's chi square test of independence

Enterprise size	micro	small	medium	large
	p- value			
the level of respondents' trust in colleagues	0,2768	0,1616	0,0675	0,3976

Source: own analysis.

The above shows that the model of the organisational culture does not affect the level of trust in colleagues declared by respondents.

- There is a statistically significant dependency between the following research categories: "the model of the organisational culture currently existing in the organisation" and "the level of trust in superiors subjectively experienced by respondents" – for all types of enterprises. The results are presented in table 3.

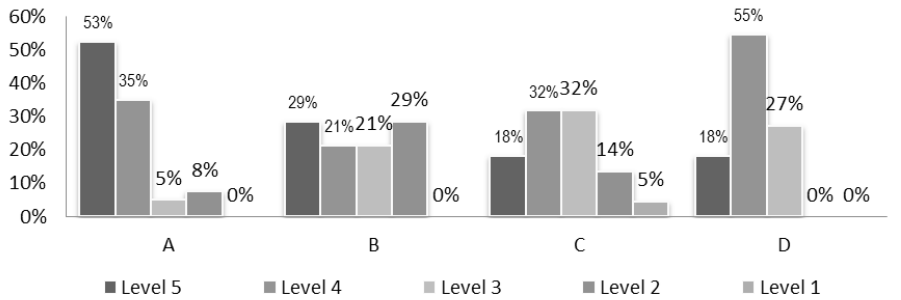
The model of the organisational culture of the enterprise affects the level of trust in line managers declared by respondents. The dependence, discussed here in detail, by categories of enterprises, is presented in figures 4 to 7.

Table 3. Level of trust in superiors and the organisational culture model – the results of Pearson's chi square test of independence

Enterprise size	micro	small	medium	large
	p- value			
the level of respondents' trust in superiors	0,0049**	0,0006***	0,0001***	0,0380*

Source: own analysis.

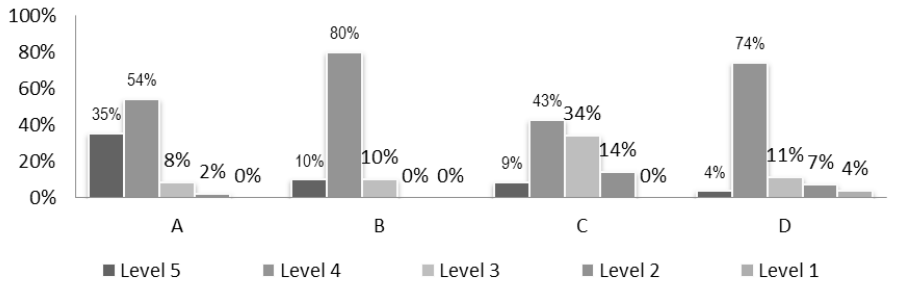
Figure 4. Trust in line managers according to employees in microenterprises



Source: own analysis.

According to the data presented in figure 4, in microenterprises, the highest trust in line managers was declared by employees working in a clan culture type of an organisation – A (53% of score 5, 25% of score 4) and a hierarchy type of culture (55% of score 4 but as only as little as 18% of score 5). Organisations with the adhocration type of culture – type B, and the market type of culture – type C responded differently (with 50% of score 4 and 5 but as much as 29% with the score of 2 and 50% of score 4 and 5 but 14% scored 2 and as much as 5 scored 1, respectively).

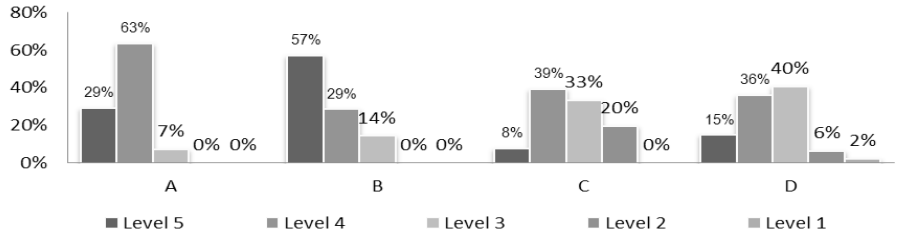
Figure 5. Trust in line managers according to employees in small enterprises



Source: own analysis.

In case of small enterprises, employees working for the clan type of culture organisation – A and the adhocration culture – B have the biggest trust in their line managers (with 35% for the score 5 and 54% at 4, respectively and jointly 90% scoring 4 and 5). A situation similar to the situation in the adhocration type of culture organisation occurred in organisations with hierarchic type of culture (D) (in total, 78% of the top scores but also 11% of scoring 2 and 1). As in the case of microenterprises, the lowest trust in line managers was declared by employees working in market types of culture – C (as little as 9% of score 5 and 14% at 2). In this case, respondents' scoring showed the greatest differentiation.

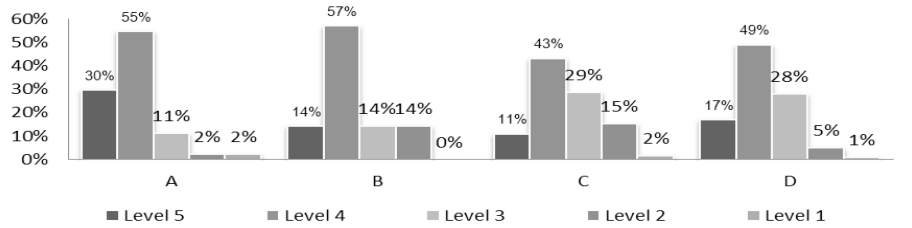
Figure 6. Trust in line managers according to employees in medium-sized enterprises



Source: own analysis.

The factographic material illustrated in figure 6 shows that the organisations with clan type of culture (A) (92% of score 4 and 5) and the adhocration type of culture (86%, respectively) have the highest level of trust in line managers, which is confirmed by the trend showed in the previously discussed types of enterprises. The results are different for organisations with hierarchic type of culture (D) – in this case, there are considerably fewer top scores than in the above-mentioned types of organisations. Market culture-based organisations (C) demonstrated again a large differentiation of scoring, with a particular indication of the highest share of the score of 2.

Figure 7. Trust in line managers according to employees in large enterprises



Source: own analysis.

In the case of large enterprises, the model of the organisational culture which is the most supportive for an increase of trust in line manager was again the clan culture – A (85% of scores at 4 and 5) and the adhocration culture (at 71%, respectively). The lowest scoring at 1 and 2 prevailed (4% for the clan culture, 14% for the adhocration culture, 17% for the market culture and 6% for the hierarchic culture).

Conslusions

The key objective of this paper was to expose the role of the organisational culture as the determinant of the level of trust inside an organisation, with a particular emphasis on the level of trust in colleagues and line managers. My analysis of collected factual material led to an answer to the questions listed at the beginning of the presented article and brought forward the following conclusions:

- The dominant model of the organisational culture, indicated as "the currently existing" model differs depending on the size of an enterprise. In micro- and small enterprises, the clan culture ranked as the dominant model of culture (30.6 and 29.5, respective), while in medium-sized enterprises the dominant culture with the culture of hierarchy (30.1) and the culture of the market in large enterprises (33.0).
- The most "desired" model, according to respondents from all types of enterprises, irrespective of their size, was the clan culture model (40.1) while the market culture model was the least desired one (16.8). Convergence of preferences in this area seems extremely interesting.
- The model of organisational culture which the respondents declared was "the existing one" clearly departs from the "desirable" model. To the largest degree, the above applies largely to large and medium-sized enterprises. However, note that even in the enterprises showing consistency (between the existing and the expected model), the percentage of respondents choosing the clan culture as the model they desired was higher than before.
- The dependence between "the existing" model of the organisational culture and the level of trust in colleagues proved not statistically significant. The trend is shown for all types of enterprises. It signifies that the model of the organisational culture does not affect the level of trust in colleagues. The conclusion is particularly interesting.
- The dependence between "the existing" model of the organisational culture and the level of trust in line manager proved statistically significant. The trend is shown for all types of enterprises. It signifies that the model of the organisational culture affects the level of trust in line managers.
- An analysis of the collected factographic material shows that the biggest trust in line managers is declared by employees in clan type (A) culture organisations, irrespective of the type of enterprise. Similar is the case of organisations demonstrating the adhocration culture (type B). The organisation in which an employee may count on support from his line manager who creates friendly work environment supports the growth of trust in line managers.

- In small enterprises, the narrowest distribution of scoring was reported, with scoring 4 and 5 given most often irrespective of the type of an enterprise.
- The largest number of respondents claiming that their level of trust in line managers was low or critically low – scoring 1 and 2 – was reported for market culture type organisations (C). Unfortunately, the exposure of financial performance at the expense of what is truly important to employees results in a clear decrease of trust in line managers.

Considering the immense importance of trust in the process of improving the quality, effectiveness and efficiency of management, it is worthwhile to make the effort to identify values considered the key values for employees. Work in an environment whose characteristics is considerably different from that important to people will always cause some degree of dissatisfaction, leading to reduced trust and, consequently, lower motivation and commitment. In the context of the above-presented deliberation, it is worth to continue the effort of exploring this topic, going towards the diagnosis of reasons for absence of trust in line managers and analysing manager's trust in their reports and managers' trust in other managers in different types of enterprises.

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Problems of Quality Culture Assessment in Higher Education

Abstract: Quality culture refers to an organisational culture that intends to enhance quality. It should be seen not as a set of procedures, but as a context in which efforts are aimed to achieve broadly understood improvement of the organization. Quality culture contains a cultural/psychological element and a structural/managerial part, which are described in this article.

The purpose of the paper is to create a better understanding of quality culture in higher education, as well as to characterize the procedure of assessing quality culture and its elements. The article presents the concept of quality culture that grows out of the issues of organizational culture and quality management. It contains the definition of quality culture in higher education and the description of selected methods and instruments used for assessment of: organizational culture, quality management systems, and quality culture.

Key words: quality culture, higher education, assessment

Introduction

The concept of quality culture in higher education is closely related to the study of organizational culture and quality management. It is useful and it should be used in the analysis of management processes, however currently, the research on quality culture in higher education, particularly in Poland, is at an early stage [Seliga, Sułkowski, Woźniak 2016]. „There is a lack of a comprehensive, well-established description, model and methodology of research in the area of quality culture in higher education institutions" [Sułkowski 2016, p. 75]. The solutions which combine tangible, structural/managerial ele-

ments (e.g. quality management systems) and intangible, cultural/psychological parts (e.g. commitment, shared values) are needed to create quality culture. Quality culture in higher education institutions (HEIs) is still a challenge for the theory and practice of management, especially since it is an area of interdisciplinary research, which combines problems of cultural anthropology, sociology and pedagogy. These reasons outline the need for research described in this study.

By taking a theoretical approach to examining quality culture, starting with an examination of the concepts of organizational culture and quality management, the aim of this paper is to create a better understanding of quality culture in higher education, as well as to characterize the procedure of assessing quality culture in higher education. The research method, named by Apanowicz method of analysis and criticism of the literature, was used to answer the following research questions:

- How to assess the cultural/psychological element of quality culture?
- How to assess the structural/managerial element of quality culture?
- Are there any methods or instruments for the assessment of quality culture in higher education?

The first part of the article presents the concept of quality culture that grows out of the issues of organizational culture and quality management and might be perceived as an advanced quality management model. Next, quality culture in higher education is defined. Afterwards, selected aspects of the assessment of organizational culture and quality management systems are introduced. Based on the literature review, an assessment model of quality culture was described. The paper ends with discussion and conclusions.

Concept of quality culture

The concept of quality culture originates from the idea of organizational culture and quality management. The culture of the organization usually develops over a long period. As the organization grows, its culture is modified. Griffin [2014] indicates that the managers' role is first to learn and understand culture, and then to decide whether to maintain or change it.

Sułkowski [2008] marks that the most important cognitive problems of the organizational culture in management include among others:

- contradictions of paradigms of understanding organizational culture,
- fuzzy and diverse definitions of organizational culture,
- lack of consent of researchers regarding the model and typology of organizational culture, its dimensions, elements or levels.

The consequence of the lack of one paradigm as well as the absence of the consent of researchers in approaches to organizational culture, is the multitude of definitions of the term organizational culture and resulting from this different approach in identifying its components. The most commonly known authors of the definitions of the organizational culture are Hofstede, Schein, Schenplein and Smircich. The author of the paper, adopts the definition of Schein, according to which "the culture of a group can now be defined as a pattern of shared basic assumptions learned by a group as it solved its problems of external adaptation and internal integration, which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" [Schein 2010, p. 18]. Schein suggests that culture can be analyzed at different levels, depending on the degree to which the culture is visible to the observer. He points the three levels of culture [Schein 2010]:

- Artifacts (visible and feelable structures and processes).
- Espoused beliefs and values (ideals, goals, values, aspirations).
- Basic underlying assumptions (unconscious, taken-for-granted beliefs and values).

Ehlers [2009] compared the definitions of organizational culture proposed by Schein, Hofstede, Ruegg-Sturm and Morgan, and he concluded that these authors' approaches emphasize shared values as a central element for organisational culture.

Undertaking a reflection on the subject of quality culture requires also the approximation of the concept quality management, which is defined as management with regard to quality [PN-EN ISO 9000]. Hamrol [2013] holds the view that quality management is a certain state of consciousness that can be seen as management of resources, processes and other factors directed consciously on the effects associated with quality. Among the concepts of quality management, he specifies: compliance with standards (requirements of ISO standards), Total Quality Management (TQM), Kazein, Six Sigma and Statistical Process Control.

When designing a quality management system (QMS), organizational culture should be taken into account as one of the important factors affecting the efficiency of implementation and functioning of this system. The relationship between the organizational culture and the QMS is particularly visible in the processess: communicating quality policy and objectives, improvement of the QMS and postulating changes in the procedures.

TQM is a management concept particularly closely related to quality culture. It is a management approach of an organization focused on quality, based on the participation of all its members and aiming at long term success through customer satisfaction and benefits to all members of the organisation and society [PN-EN ISO 8402]. Bright and Cooper found that TQM makes a number of assumptions about organizational culture. They point out that the QMS is shaped in the organization at the level of artifacts and behavioral rules, i.e. the most conscious ones. In the enterprises that have extensi-

ve experience in applying the principles of quality management, it is possible to shape standards and values in the long term. At the same time, the authors note that only the most advanced organizations can make effective attempts to influence selected elements of the third, unconscious level [Bright, Cooper 1993].

As the concept of quality culture emerges from the idea of organizational culture and quality management it might be defined as "a system of shared values, beliefs and norms that focuses on delighting customers and continuously improving the quality of products and services" [Malhi 2013, p. 2]. Furthermore Ehlers [2009] declares that quality cultures have tangible and intangible parts (visible and invisible) and therefore can be developed best when tangible, structural elements (e.g. quality management mechanisms) are evolving in parallel with intangible elements (e.g. commitment, values).

Quality culture in higher education

Due to the subject of research in this article, it is worth considering what organizational culture is with reference to the academic institutions. It might be defined as „persistent patterns of norms, values, practices, beliefs, and assumptions that shape the behavior of individuals and groups in a college or university and provide a frame of reference within which to interpret the meaning of events and actions on and off the campus" [Kuh, Whitt 1988, p. 6]. According to Kuh and Whitt, culture is revealed through university artifacts, such as: mission statement, architecture, academic program, language, myths, stories, symbols, rituals, and ceremonials as well as through an examination of espoused and enacted values, beliefs and assumptions shared by the academic community and other constituents.

Dill, one of the first researchers interested in the organizational culture of academic organizations, notes that „academic institutions may best be understood as value-rational organizations grounded in strong cultures described as ideologies and belief systems" [Dill 1982, p. 303]. He argues that HEIs have distinctive cultures which are developed and sustained by identifiable actions of the academic society. Among these actions he indicates two: the presentation of symbolic events (e.g. honoring a distinguished professor), which emphasize the core values of the academic institution and creating structural bonds (e.g. collective appointment of faculty authorities), which help transmit the core values of the organization [Dill 1982].

In the past three decades, the concepts of quality management, intended originally for enterprises, were broadly adopted by HEIs, what was mainly caused by the increased public demand for accountability of the higher education sector. Considering the scope of the quality management concepts, in the case of universities, two concepts may

be applied: compliance with standards – requirements of ISO 9001 and TQM. It is also advisable to develop an individual quality management model, taking into account the most appropriate elements for the university, resulting from its development strategy [Próchnicka, Tutko 2015].

A family of quality standards ISO 9000 provides guidance for all sorts of organizations who seek to ensure that their products consistently meet customer requirements. In recent years, an increasing number of educational organizations have developed a QMSs based on these standards, which was due to the growing awareness of the benefits of this doing so. On the other hand, Dumond and Johnson [2013] argue that this system is too bureaucratic, its implementation and maintenance is associated with high costs and that it is often not accepted by the academic community.

TQM is a management concept, based on the ideas by Deming and Juran. Wawak [2012] remarks, that TQM enables continuous improvement in HEIs and ensures its quick adaptation to the changing environment. On the other hand, as TQM has been applied to different academic institutions, its appropriateness and suitability are sometimes questioned. For instance, Kohn [1993] has rising concerns that TQM might be useful within industrial organizations, but not in the classroom.

The most commonly cited definition of quality culture in higher education, also adopted in this study, is the one formulated by the European University Association (EUA), according to which „quality culture refers to an organisational culture that intends to enhance quality permanently and is characterised by two distinct elements: on the one hand, a cultural/psychological element of shared values, beliefs, expectations and commitment towards quality and, on the other hand, a structural/managerial element with defined processes that enhance quality and aim at coordinating individual efforts" [EUA 2006, p. 10].

Based on the above definition, the two elements of quality culture can be identified: a cultural/psychological component and a structural/managerial part. These elements are to be considered jointly, and must be linked, through communication, discussion and participatory processes at institutional level of HEI. The above-mentioned definition refers to the idea of organizational culture and quality management, in the context of higher education.

Research methodology

The research method used in the study is the method of analysis and criticism of the literature. This method is generally exploited to demonstrate what is known and what is not, what already exists and is included in the literature and what is missing and should be proven by research [Apanowicz 2002]. In this paper the method of analysis and criti-

cism of the literature was firstly used to develop the theoretical background of the study i.e. to define the terms quality culture, and then quality culture in higher education. Secondly it was utilized to explore selected aspects of quality culture assessment in higher education.

Assuming that there are two elements of quality culture, a cultural/psychological component and a structural/managerial part, the following research questions have been posed in this study:

- How to assess the cultural/psychological element of quality culture?
- How to assess the structural/managerial element of quality culture?
- Are there any methods or instruments for the assessment of quality culture in higher education?

Assessment of quality culture

Quality culture contains a cultural/psychological element and a structural/managerial part. This division means that other methods and instruments should be used to examine each of these elements. Methodologies used to investigate the first element refer to the idea of organizational culture, and the second element refers to quality management.

Assessment of organizational culture

Researchers interested in the organizational culture refer to a rich instrumentation of cognitive and pragmatic methods and employ both, quantitative and qualitative methodologies. They might include techniques: participant observation, in-depth interviews, text analysis, focus groups, projection techniques, narrative methods, surveys and others. The results of quantitative research are descriptions of organizational cultures, that reduce the studied phenomenon merely to a few dimensions, often do not allow to fully understand the whole aspect. On the other hand, the effects of anthropological research are frequently, in turn, descriptive, dispersed and unrepresentative case studies that usually do not allow generalization [Sułkowski 2016].

Organizational culture is a complex phenomenon. Further, it is not isolated from other elements of the organization. Many parts of a cultural/psychological element of quality culture are invisible, often even subconscious, and therefore difficult to observe and measure. More complex in terms of research is the question of values that affect the behavior of members of the organization. Kostera writes, that, as a rule, research in this field is carried out using quantitative techniques, such as surveys. In her opinion, the most common way to study culture, including organizational culture, is ethnography –

qualitative research aimed at studying social processes in their natural context [Kostera, Śliwa 2010]. It is worth differentiating the methods taking into account the goal and the subject of research. If the aim is to determine what are the cultures' dimensions, the values in an organization, the characteristic patterns of behavior, quantitative research is indicated. If, however, the goal is to explain the meaning of phenomena, then qualitative research may be more effective.

There are a lot of existing qualitative and quantitative instruments for the exploration of organizational culture. Some of them are indicated in the table 1.

Table 1. Instruments for the assessment of the organizational culture

Name of the instrument	Author/source
Assessing Learning Culture Scale	Botcheva L., White C.R., Huffman L.C. (2002), *Learning culture and outcomes measurement practices in community agencies*, "The American Journal of Evaluation", 23(4), pp. 421–434.
Culture Assessment Framework	Transforming Culture and Conduct, https://www.tcc.group/solutions/protect-your-future/culture-assessment-framework-2/.
Five Windows into Culture Assessment Framework	Levin I.M. (2000), *Five Windows into Culture Assessment Framework: An Assessment Framework and Approach*, "Organization Development Journal", 18(1), pp. 83–94.
Global Leadership and Organizational Behavior Effectiveness	GLOBE, http://globeproject.com/.
Hofstede's Culture Measures	Hofstede G., Neuijen B., Ohayv D.D., Sanders G. (1990), *Measuring Organizational Cultures: A Qualitative and Quantitative Study Across Twenty Cases*, "Administrative Science Quarterly", 35(2), pp. 286–316.
Organizational Culture Profile (OCP)	O'Reilly C.A., Chatman J.A., Caldwell D.F. (1991), *People and organizational culture: A profile comparison approach to person-organization fit*, "Academy of Management Journal", 34(3), 487-516.
Organizational Assessment Survey	U.S. Office of Personnel Management https://www.opm.gov/policy-data-oversight/data-analysis-documentation/employee-surveys/buy-services/organizational-assessment-survey/.
Organizational Commitment Questionnaire	Harold L.A., James L.P. (1981), *An Empirical Assessment of Organizational Commitment and Organizational Effectiveness*, "Administrative Science Quarterly", 26(1), pp. 1–14.
Organizational Culture Assessment Instrument	Cameron K., Quinn R. https://www.ocai-online.com/.
Organizational Culture Inventory	Cooke R.A., Szumal J.L. (1993), *Measuring Normative Beliefs and Shared Behavioral Expectations in Organizations: The Reliability and Validity of the Organizational Culture Inventory*, "Psychological Reports", 72(3), pp. 1299 – 1330.
School Quality Management Culture Survey	Detert J.R., Schroeder R.G, Cudeck R. (2003), *The measurement of quality management culture in schools: Development and validation of the SQMCS*, "Journal of Operations Management", 21(3), pp. 307–328.
The Cultural Audit	Fletcher B.C., Jones F. (1992), *Measuring Organizational Culture: The Cultural Audit*, "Managerial Auditing Journal", 7(6), pp. 30–36.

Source: own elaboration.

There are certainly other instruments and approaches in the exploration of organizational culture. From the instruments presented in Table 1, it may be a good solution for higher education institutions to use School Quality Management Culture Survey (SQMCS) or Organizational Culture Assessment Instrument (OCAI).

The SQMCS is an instrument that allows to study the behavioral norms and the underlying values and beliefs, through providing verified scales for evaluating multiple aspects of a schools' quality culture.

The OCAI is a validated tool for assessing current and preferred organizational culture, developed by Quinn and Cameron. It is used to identify the organizational culture profile based on the core values, interpretations, assumptions and approaches that describe organizations. The authors generated OCAI in addition to their Competing Values Framework, based on four dominant culture types (i.e., clan, adhocracy, market, and hierarchy) [Cameron, Quinn 2015]. As an illustration, OCAI was applied to describe the organizational culture type exhibited by Ohio State University Extension personnel [Berrio 2003].

Assessment of quality management systems

The purpose of the QMS assessment is to identify and eliminate errors and hazards associated with them, and to verify if it is possible to meet the requirements of clients and organizations. Hamrol [2013] points out there are the following basic forms of QMS assessment: quality audits, management reviews, and quality awards contests.

Audit is a "systematic, independent and documented process for obtaining objective evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled" [PN-EN ISO 9000, p. 34]. A system, process and product audit can be distinguished. The system audit allows to acquire information if the implemented QMS is effective. The process audit allows to assess the compliance of the process with the requirements specified in the procedures, etc. Whereas the product audit means an independent assessment of the product's quality.

Review is a "determination of the suitability, adequacy or effectiveness of an object to achieve established objectives" [PN-EN ISO 9000, p. 31]. The management review is realized through periodic, planned and documented meetings of the top management with persons responsible for the implementation of the quality policy objectives, and it is dedicated to the assessment of the effectiveness of QMS.

The third form of QMS assessment occurs when the organization applies for one of the quality prizes: European Quality Award, Malcolm Baldridge National Quality Award, Deming Prize, The Swedish Quality Award or Canadian Framework for Business Excellence. In this case, the assessment process is based on the model, appropriate for the given case.

Assessment of quality culture

The European research projects which explored quality culture problems were "Examining Quality Culture in Higher Education Institutions" conducted by the EUA and "heiQUALITY Cultures Project", designed as a multidisciplinary cooperation project between German HEIs. The first project was aimed at identifying institutional processes and structures that support the development of an internal quality culture, while the goal of the second project was to develop a definition of the term quality culture and to develop quality culture inventory.

In the scheme of the "heiQUALITY Cultures Project" elements of quality culture were identified. These are: communication, leadership, trust, information, commitment, responsibility, and participation [Sattler, Götzen, Sonntag 2013]. Furthermore an assessment model of quality culture was developed. It is based on the basic assumptions of the EUA, regarding the two levels of quality culture: a structural-formal and an organizational-psychological level.

The structural-formal level includes defferent elements of quality assurance, which may be subdivided into normative (e.g. quality goals), strategic (e.g. governance structures) and operative levels (e.g. tools for evaluation). At the same time, collective and individual criteria were distinguished at the organizational-psychological level, such as commitment, responsibility, and engagement (which represent individual attitudes towards quality), and a leadership, communication, participation, and collaboration (relating to collective criteria). The mutual basis for these criteria is trust and shared values [Sattler et al. 2013].

Discusion

Mass education has led to the transition from the elite to egalitarian model of higher education, which took place at the expense of changes in the academic culture. That is why it is worth to develop quality cultures, which could replace traditional academic culture. It does not imply that universities should break with tradition. On the contrary, the quality cultures could be based on the academic tradition [Sułkowski 2016]. At the same time, they could draw on management sciences, especially from the management of the organization culture and quality management. Solutions taken from the business world should not, however, be transferred to the academic institutions without reflection. They should become a part of the created quality culture.

The present study nuances the picture of quality culture in higher education, taking into account that it is characterised by two distinct elements: a cultural/psychological

element and a structural/managerial part. The results are in line with the view, that quality culture is a complex, socially constructed phenomenon, which cannot be analyzed in isolation from the specific context in which it is embedded and cannot be transferred from one organisation to the other [Harvey, Stensaker 2008]. Ehlers [2009] also remarks that understanding of quality culture in higher education has at least two dimensions. The first one is a structural dimension, which results from quality management. The second is the dimension of values of an academic organization.

The "heiQUALITY Cultures Project" assessment model, described in this paper includes many constituents of quality culture in higher education. Ehlers [2009] shows a similar approach, and he argues that it is important to approach quality holistically and combine cultural elements, structural dimensions and competencies into one holistic framework, enabling stakeholders to develop visions and shared values. In the opinion of the author of this study, it it's worth adding some elements to this model. These are customer orientation and continuous improvement.

Conclusions

The concept of quality culture is useful cognitively and should be used in the analysis of management processes in HEIs. It is also of great practical importance. In order to be able to manage quality culture, it first needs to be assessed. And this is what this paper has been devoted to. However, due to the limited size of the article, the issues of quality culture assessment were only outlined: therefore, this article may be treated as an introduction to the proper, future research.

Although in the foreign literature, many scientific publications were created in the field of quality culture in higher education, there are still only a few publications on this subject in Poland. So far, the most in-depth research was conducted by Sułkowski. It seems therefore purposeful to study quality culture with reference to the Polish higher education system.

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The Digitized Voice Is Calling: Re-imagining Organizational Practice And "Consciousness"

Abstract: The numerous dimensions of organizational existence have been extensively examined in management studies; however, the concept of organizational imagination and consciousness has been less explored. The efforts of our research were aimed at discovering how organizational imagination impacts both social and material phenomena and how it contributes to a specific collective way of thinking, perceived as organizational consciousness, which fuels change on multiple levels and impacts the organizational ecosystem. We arrive at the conclusion that organizations that take the risks and embrace organizational imagination give themselves the chance to grow in unexpected ways and as they challenge the comfortable status quo, they are faced with some consequences because the ability to reimagine does not always sit easily with the organizational ecosystem.
Key words: digital humanities in management, social change, organizational imagination, non-human actants, Actor Network Theory

Introduction

Organizations, to borrow a metaphor from Gareth Morgan resemble human organisms [Morgan 2006]. This is a powerful metaphor because, in addition to the artefacts that constitute the materiality of an organization (also understood as the routine procedures

that are followed, codified organizational behaviour and the managed distribution of knowledge), it allows us to discern the less obvious aspects of organizational life. However, what we have in mind is what can be termed as organizational consciousness. Yet this is not an identity that invokes values and history, but a type of consciousness that is responsible for the development of an organization, for forward thinking and for invention. Though it may appear to be so, it is not the usual sum of the consciousness of the people working in an organization, but a form of synergic flow of thought and ideas, and a mode of building communicative relationships both between people and – in organizations applying new technology – between the *human and non-human*. This particular understanding of an organization will be investigated within the context of the development of Bruno Latour's Actor Network Theory (ANT). We turn to ANT because it stimulates unorthodox ways of capturing social phenomena by focusing on the interconnection of different actors; in our case it illuminates the human and technology relationship. The theory allows us to explore organizational life in a narrative way [Czarniawska 2005], recognising that time plays an important role in constituting a type of a story (genre) that shapes relationships. Because the organization is seen as a sociotechnical network [Latour 2005] that entangles together a variety of actors, it also implicates a certain methodological approach to explore this dynamic process. Rather than focusing on gathering quantitative data, it calls to focus on qualitative, induction methods that are able to shed light on flexible and changing networks. For this purpose, we selected one organization as a case study to gather rich empirical material about the object of the research – digital voice – and, as we have followed it, we have also found a way of exploring the network without being lost in its dense mesh.

The organization selected is VoicePIN, the first voice biometrics producer in Poland which explores the use of artificial intelligence in different fields. VoicePIN main product is a system that provides a range of voice biometrics solutions for the user. It allows users to log in and authenticate themselves without the necessity of remembering passwords or PIN numbers. It also acts as a system for fraud detection and proof of life. VoicePIN operates in a reality where people and technology are bonded tightly, working on the algorithms that transform individual voice into a unique mathematical model. Analysing this particular organization gave us the opportunity to lead our inquiry into the realm of human-non/human relations and observe how using technology in imaginative ways lead to organizational transformation.

In the first part of the paper, we discuss our research questions and present the theoretical background to the concept of organizational imagination. Next, we explore the purpose of using ANT theory and relate it to the proposed understanding of consciousness. Then we clarify the methodology used and present the main findings of the research, which are examined through the application of agency in ANT theory. We do so

in a critical manner to expose to what extent ANT theory can be helpful to analyse reality formed by an effort to create imaginative ways of using artificial intelligence. The paper ends with the conclusions which explain how organizational imagination and the use of metaphorical language in our analysis have shed some light on the new field of research and understanding of how humans coexist with intelligent machines equipped with AI in a work environment made up of advanced technologies. We end the paper by indicating possible questions for future research.

Objectives and theoretical background

Our research efforts are centred around two key questions concerned with this theme: How do organizations conceive their limits and how do they exceed them when wishing to create a new business reality and initiate social change? What influence does the *non -human* factor, the technological actor, have on organizational "consciousness" when, as we suspect, and as we attempt to verify in the research, speaking its own "language" of computer code, algorithms or AI, it becomes a factor influencing relationships and organizational learning and, above all, a component on equal terms with all others in the contemporary organization? The presence in the organizational ecosystem of *non-humans* that "speak" inevitably causes people to listen to this "voice" intently. The use of inverted commas here is only the expression of a certain linguistic powerlessness which appears when certain concepts, such as conversation, voice, listening, learning or pursuing social relationships, which in traditional discourse are attributed only to humans, extends their fields of meaning into ambiguous contexts associated with the technological voice of a subject that is no longer an inanimate object, but a dynamic factor that speaks in organizations, is heard in them and produces effects in them. This has an influence on strategy and on the concept for growth and development, initiating, and, in certain cases, taking over the processes involved in devising new products and new services or, as we framed it in the title – re-imagining organizational practice and "consciousness".

The term 'organizational imagination' has a presence in academic literature. Charles Wright Mills refers in his book *The sociological imagination* [Mills 2000] to a particular tension between individual experience and something he named 'social imagination'. This is a particular feature of group experience, or rather perspective, that allows an individual to take a voyage of self-discovery on a collective level and engage in a public sphere.

The sociological imagination enables its possessor to understand the larger historical scene in terms of its meaning for the inner life and the external career of a variety of individuals. It enables him to take into account how individuals, in the welter of their daily experience, often become falsely conscious of their social positions. Within that

welter, the framework of modern society is sought, and within that framework the psychologies of a variety of men and women are formulated. By such means the personal uneasiness of individuals is focused upon explicit troubles and the indifference of publics is transformed into involvement with public issues [Mills 2000, p. 5].

In the science of organizational management, imagination, as a subject of theoretical interest as well as practical interest, appears thanks to Gareth Morgan, who in his book, *Images of organization*, offers not only a new way of thinking about an organization, but also conceptualizes different kinds of organizational problems by using tailored metaphors. Thanks to Morgan, we can think about organizations as machines, organisms, brains, cultures, political systems, physical prisons, flux and transformation and instruments of domination. Morgan emphasizes a strong relationship between the theory of management and organization, using imagination and a metaphorical way of thinking about organizations.

This book explores and develops the art of reading and understanding organizational life. It is based on a very simple premise: that all theories of organization and management are based on implicit images or metaphors that lead us to see, understand, and manage organizations in distinctive yet partial ways [Morgan 1986, 2006].

Organizational imagination can be itself read as a metaphor. Is it legitimate to talk about organizational imagination rather than the individual imagination of the people employed in it? Why is it important in the context of organizational management to assess the role of imagination? In our opinion, it has the potential that allows an organization to move existing and historically made borders of its function. Organizational imagination is derived from a particular organizational culture. This organizational culture allows people that make up the organization opportunities to be involved in discussions and free communication, but also even more importantly, it encourages people to take risks and engage in lateral thinking. Organizational imagination therefore emerges in a dialogue and with the conviction that new ideas, if capable of influencing the organization itself and its products or services, are desirable and can be perceived as the fuel that drives organizational development.

Imagination, as discussed above, brings to the study both collective and individual actors, who through the act of imagining become the subject and the object of transformation. The act of transformation might be seen as a spectrum of different occurrences and, however useful (and tempting) it is to narrow down the trace of research when studying it, we attempt to embrace this variety of different states by using ANT theory to penetrate below the surface of the obvious.

ANT does not designate a domain of reality or some particular item, but rather is the name of a movement, a displacement, a transformation, a translation, an enrollment. It is an association between entities which are in no way recognizable as being social in

the ordinary manner, except during the brief moment when they are reshuffled together [Latour 2005].

This perspective, which is offered by ANT to understand how different actors (in the case of our research, people and technologies) relate to one another in time and space, puts emphasis on interactivity and a polysemic treatment of organizations that is highly complex and entangled yet possible to explore by using the act of translation [Czarniawska 2009, pp. 424-426]. According to ANT, translation prevents the constant movement and interplay of different actors from ending up in a chaotic, inoperable mass, stripped of sense and meaning; we, however, point to consciousness.

For Latour [2005], translation prompts two mediators into coexisting in a process of finding meaning, but to find the meaning there is a need to understand each other. On the other hand, consciousness is much more freely associated with knowledge or understanding that is needed in translation. The common expression – *I am conscious* means certain awareness, which is closer to feeling or sensing. In our understanding, consciousness gives a sense of purpose and a sense of identity, hidden deeply and hard to define, but yet observable through actions and decisions.

Paradoxically, consciousness, as a fragile and difficult to locate essence (is it the brain, the heart or the soul?), preserves organizational integrity and helps to respond to its dilemmas. It stabilizes the life of an organization by allowing ways of doing things to appear.

Qualities associated with consciousness [Pruzan 2001], such as the ability to reflect on existential matters, help to answer questions, such as who are we?, what do we want to achieve?, and what is permitted?, which also introduces ethical considerations.

Methodology

In this paper, our methodological imperative was directed at finding the way to construct empirical accounts that reflect the transformative and dynamic character of the organization as approached by ANT theory, which treats the social as a network of interests between various actors entangeled in complex interplay [Cecez-Kecmanovic et al. 2004, p. 814]. Therefore, data was gathered by outlining links and tracing dependencies in a dense network of socio-technological relations. It occurred that the network could be explored systematically, as we followed the non-human actors and analysed how the digital voice is calling and how it has been called upon. This methodological principle is designed to ensure the richness of empirical material [Plesner, Philips 2013]. The methods employed in our research were based on qualitative, face-to-face interviews with semi-structured questions that evolved into differentiated discussions depending on

interlocutors' roles and levels of experience in a particular organization. Actors were treated as mediators [Latour 2005] that could offer guidance in exploring their reality and explaining how they perceive it. In total there were four interviews (each lasting about 90 minutes) with people working in the organization and one (60-minute) interview with a business client that uses VoicePIN as an authorization system for its employees to allow access to digital accounts and physical access to some parts of the office building. There was also one observation of an individual using his voice to log on to a banking system and use a call centre to resolve an issue. During the research phase, we were also granted access to company documentation, different case studies and we were able to exchange emails if we needed clarification on different matters.

The research started by attending one of the meet-up events set up in Krakow by a global organization focused on attracting women to technology. The meeting gathered specific type of people from different fields but with shared interest in programming, AI and coding. The VoicePIN Sales and Customer Experience Director presented a talk tilted "Passwords and PINs are neither strong nor sexy. Your Voice is!".

The main part of the talk explained how the organization operates and what values it holds as the most important, but significant time was also spent on technology that deals with machine learning and comprehension (natural language understanding and natural language processing), the development of the digital voice and its market implementations. Numerous statistics were shown to indicate that using a voice to gain access and confirm identity has been the safest security option up to now, especially in a banking system.

Research results and discussion

In the first part of the presentation of the company, the audience was positively interested and the ideas of simplifying the process of authorization and escaping the need of remembering the passwords were praised. But when the algorithm was introduced, the mood changed. The discussion that followed the presentation was to certain extent confrontational; individuals praised the company (its values and innovative way of thinking), but strongly questioned the capacity of the AI being able to recognise the user in various circumstances. Problems mentioned were connected to the algorithm's ability to recognise the voice because of a faulty device or background noise. A long time was spent discussing whether sickness, a husky voice or puberty would have an impact on effective voice recognition. In general the questions asked and issues raised were indicative of a lack of trust in the technology, limiting belief in its ability to create safe solutions, and its unethical potential. Our attendance at this event triggered our interest. We were able to schedule a follow up meeting that started the process of getting to know the organization.

The organization evolved from a small software company offering development of dialogue systems for call centres that were dedicated to create an automatic agent for handling queries. The organization saw the potential of the technology and envisioned a more complex and innovative way of using it. At this point, strategic changes were implemented; the organization decided to rebrand and re-open under a different name, with a different product and address the market with a new marketing strategy. The decision to leave a safe and known market segment was driven by the ambition to develop the technology in a way that would have made the organization independent from other software suppliers and provide it with the potential to use the technology on a global scale. Changes in the code transformed the organization, but also fuelled the need to reimagine and redesign itself against risks and uncertainties. It took the organization three years to develop a new algorithm; it was possible to spend that much time in the development phase because the owner of the company was able to find an investor who granted financial support for the envisioned future.

Today the organization has 24 employees, working in three different, similarly-sized departments: R&D, Software/Product development and Sales. The structure is flat and flexible, so it can embrace change and support innovative ways of thinking. The main office is in Kraków in Poland, but as the demand for the product rose in the US, the company opened an office in Sunnyvale, California.

The VoicePIN is the main product offered on the market, but the organization is prolific in finding ways to utilize the developed technology in creative ways, re-imagining constantly the use of its know-how. This approach has resulted in a range of implementations, one of them being the Proof of Life for the South Africa Social Security Administration. The most technologically advanced project, which the company is hoping to launch next year, is closer to personalized prediction and emotion recognition. Despite the fact that the project is now in an advanced phase, the possibilities of using it are still open to the extent of even being unknown to both the market and to the creators. Utilizing technology has also been the subject of collaboration with ZoraBots, the robot assistance that worked at a Belgian airport during the Christmas season.

ANT theory application to non-human actor

So far, we have presented the organization in a narrative that hopefully is able to capture the general picture of the socio-technical net of relations and the role imagination plays in it. In the next few paragraphs we would like to present specifically the influences of an algorithm, a non-human actor, on organization to illustrate an array of outcomes. To do so, we will use the classification of agency and its contribution to social life offered by

Sayes [2014], who, in the article titled *Actor–Network Theory and Methodology: Just what does it mean to say that nonhumans have agency?,* introduces four types of non-human agency with corresponding impacts on social life:

1. A non-human gives agency seen as a condition for the possibility of human society and becomes necessary stabilizers of the human collective.
2. A non-human acts as a mediator that is able to transform relations between actors and adds value to the chain of interactions.
3. A non-human becomes a member of moral and political associations.
4. A non-human brings together actors of different temporal and spatial orders.

The broad categories of the possible roles that non-humans engage in do not make a comprehensive list, but rather evoke some epistemological order, which, apart from being systematic in utilising the ANT theory, allows us to reach a new depth of understanding of organizational existence in relation to non-human actor.

The first category captures the ability for a human to be able to distinguish himself/herself from the other, non-human actors and, because of that, maintain the solidity of human society [Sayes 2014]. In the case of the digital voice that limits for a our identity to the sound short time and later to the mathematical model we expect it to be exactly like we are because this is the principle of the authorization process.

We are used to validating our identity using our biological code – DNA, fingerprint, eye – but if we are limited merely to sound, which is so fragile and vulnerable, how can we trust that our voice will not fail us and that the algorithm will correctly confirm that we are who we say are? This question about identity, philosophical or theological at its root, changes into a form of a test that is considered successful if one's voice matches its mathematical representation in a digital environment. This way of approaching technology blurs the border between the human and the non-human but in the case of VoicePIN has some right to be expressed. If we take a closer look at the work architecture of the VoicePIN developer, it almost makes the human-non human relationships in the organization seem inseparable and in some cases even ontologically undetermined. This can be seen in the following extracts from the interviews:

- *There is no human element during the process of working with a voice;*
- *The human element is present during the implementation process, when we check if the technology is well integrated;*
- *The only alive person is the user and our system.*

The code also can be analysed in the conjunction to the second category mentioned above, indeed it acts as a mediator that is able to transform relations between actors and adds value to the chain of interactions but when doing so often destabilizes the collective, puts pressure on the organizational identity by bringing conflict and tension. The code is constantly being developed in the organization, it is being used and tested

outside, by the customers, it changes its functionality and requires new solutions. The code is not simply a tool, or a placeholder [Latour 2005] that produces a digital voice, but it also has its subjective presence that impacts the interaction process. It may centre people around it, literally in a team and metaphorically as it impacts the relations, but also brings struggle and loosens the relationships.

> *There are times that we feel we've hit the mathematical ceiling, because mathematics limits us. In a way, it doesn't deliver the ability to translate some phenomena into a model. You need to have lots of faith and trust in the idea, team and algorithm, so that you will not give up. Failures are part of the process and a lesson for all of us.*

The algorithm can be also seen as a member of moral and political associations, it raises questions about the social responsibility of the organization and legal accountability.

> *We understand that our technology is making some aspects of people's lives easier, but it doesn't make them change. So, the way to develop is to look for a model correlated, for example, with big data and individual users, to create something with a big impact factor.*

The algorithm also changes society on a larger scale, because of the organization's experience in the field of AI the government has been consulting it to develop new polices concerning use of technology and access to data.

The last category pointed by Sayes [2014] directs analysis of non-human to its ability to gather different actors together which is particularly interesting when applying to AI.

"Sapiens often use visual marks such as a turban, a beard or a business suit to signal 'you can trust me, I believe in the same story as you" [Harari 2016, p. 167].

When working with or for algorithms, this lack of clear set of rules, lack of visual clues, lack of shared stories and myths will impact how we build relationships with others whose behaviour we sometimes cannot predict but more often, as noticed by Domingos [2015], we cannot explain. Non-human gives meaning to the organization – awareness of what we are for, why we are together it gives understanding of togetherness as oppose to otherness. Yet at the same time the AI polarizes people and creates divisions, it offers wealth to some but at the same time makes the work of other scarce, it and escapes the categorization and simple judgment.

Conclusions

When we contemplate what creates organizational frames and what sets organizational borders, we arrive at the conclusion that on the one hand it is the infrastructure, the buildings and the particular address on a geographical map and on the other hand it is the documentation, the status of the organization, its regulations and its wider procedures.

The bureaucratic layer of an organization is, in a sense, a skeleton on which non-material aspects of culture are placed together with human relationships. Organizational imagination violates the current order, undermines set rules, pushes the boundaries of organizational taboo, generates new values and also creates a foundation for inventing new and previously unknown organizational relationships, for example human with machine, of which the latter stops being only a material artifact, but, in some circumstance, responsive and imagined in an AI 'person'.

So, we arrive at the conclusion that implementing new ways of doing things requires new ways of thinking associated with finding innovative solutions, which in our case study occurred on the borders of meaning of human non-human where the relationship formed by different actors starts to form a entangled unity. This transformation is rooted in the constant perception of change as a desirable goal in itself, bringing thrills and satisfaction, but also frustration and struggle.

The human-non human relation [Latour 2005] generates new fields of research to ask questions about the institutional continuity of an organization and fosters the ability of organizational metamorphosis which helps an organization to fit into new social and technological contexts, and also provokes enquiries concerning organizational identity and culture. Taking all of the arguments into consideration, we believe that the following questions are valid:

What is the impact on the redefinition of the term "multicultural", which is used more generally to describe the relationship between people representing different cultures, and how could this be applied to describe the relationship between man and things that also "learn" from him? Does a long-term period in an environment where there are intelligent and reactive machines have an impact on developing hybrid identities in people cooperating with them? Finally, what significance may it carry for an organization's values in a deeply ethical sense?

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Conceptualizations of Information and the Impact of Information Overabundance on Modern Management[1]

Abstract: Since the expansion of the Internet in the 1990s, there has been a dramatical surge in the volume of measurable information. This phenomenon may be termed information overabundance and concerns both the production and reception of this resource. The main consequence of this trend has not simply been an increase in the number of signals being created and received by social actors but also growing difficulties in assigning meaning to such a large body of information. Therefore conceptualizations, interpretations and definitions of information must be revised. The aim of this paper is to study how information overabundance is influencing the conceptualization of information in modern management. A deeper understanding of information is essential under such circumstances. The conjectures formulated in the paper are illustrated together with an extensive survey of conceptualizations of information. Areas of future research on the new-inter- and multi-disciplinary character of the various definitions and interpretations of information are also proposed.

Key words: information, approaches to information, information overabundance, inter-disciplinarity, multi-disciplinarity

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Introduction

When it comes to such terms as Information Society, Knowledge-Based Economy, etc., "information" and "knowledge" are treated as *a priori* concepts. The inexactitude of such forms is not admissible in modern management where at least minimal definitional accuracy is essential. Leaving aside the concepts of knowledge, which constitute a separate field of research, we can conclude that "information" is a multi-faceted utterance. It is simultaneously something physical, cognitive and specifically associated with individuals. Information is also shaped socially and culturally. The following questions need to be asked: What conceptualizations of information have been developed? What were the processes underlying their development? Only after studying the processes of sensemaking for this term employed by various social actors can attempts be made to elaborate and apply more reality-relevant conceptualizations of information.

Defining information also involves another important problem, namely that resulting from its inherent reflexivity, self-reflexivity, self-reference and recursivity. Information is discussed *a priori* at the meta-level since its meaning is at least partly defined by knowledge and information itself. It is thus a kind of "nested idea". Despite having an important bearing on management, this phenomenon has not attracted sufficient attention.

Since the accelerated development of information systems labelled as the Information Age [Toffler 1981], followed by the expansion of the Internet in the 1990s, we have observed a dramatic surge in measurable information. We can describe this phenomenon as information overabundance and it concerns both the production and reception of information. Its main consequences include not only an increasing number of signals created and received by social actors but also growing difficulties in assigning meaning to the overwhelming volume of information. That is why current conceptualizations of information must be revised.

The aim of the present paper is to study how information overabundance is influencing our conceptualization of the utterance "information" in modern management. A deeper understanding of this term is vital for decision-making processes in which advanced IT systems are applied.

Formulating hypotheses in a positivist or neopositivist sense is not always possible in a conceptual survey paper. However, a number of conjectures may be proposed. First, any application of the term "information" in modern management should be based on a deeper analysis of its conceptualizations. In other words, the social actors involved in its production and reception should be aware of the information sensemaking in management. Second, the demand for a deeper analysis of information in modern management is being driven by a new phenomenon – information overabundance. Third, it wo-

uld be desirable to identify the patterns of social construction that shape information. The proposed approach has special significance for Information Technology-supported decision-making, and in a more general sense, for all cases of man-made machine-interactions in management.

The ontological, epistemological and methodological foundations applied in this paper are derived from "moderate constructivism" and the ontological assumption of the existence of "being" (reality) as well as the epistemological assumption that "being" (reality) is approximated in an intersubjective discourse that embodies both a qualitative (verbal) approach and mathematics. The use of such notions as information and knowledge requires at least minimally precise terminology. Hence, ideas from the philosophy of language [Wittgenstein 2002], hermeneutics [Mantzavinos 2016], linguistics [Lakoff, Johnson 1995] and constructivism [Glasersfeld 1995; Searle 1995] are taken into account.

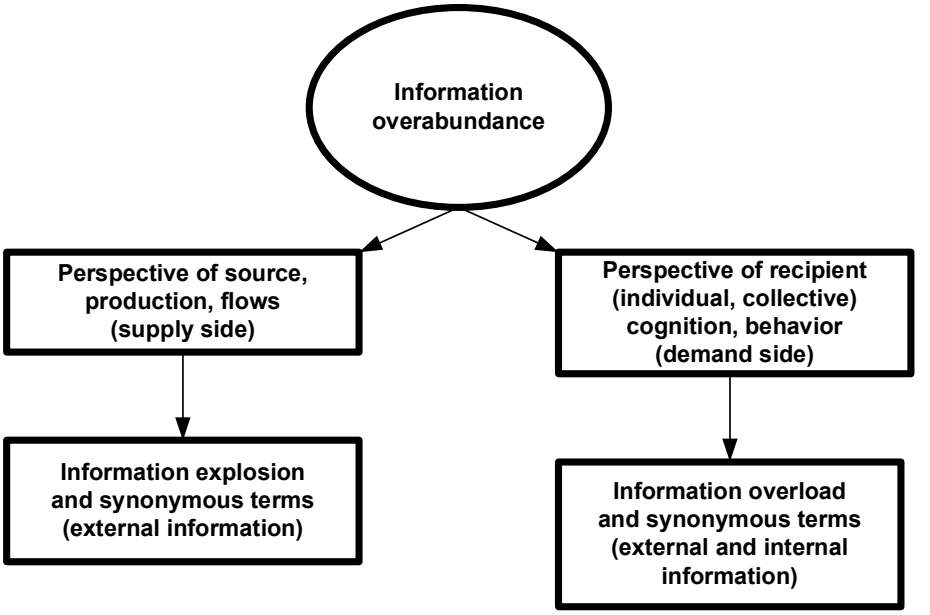
Two additional premises are resulting from the assumption of "moderate constructivism". First, in management literature the qualitative vs. quantitative research dichotomy is often exposed, especially in methodology, and subsequently also in epistemology and ontology. A more in-depth inquiry into the philosophy of social science leads to the conclusion that this divide is artificial. Without delving into the philosophy of mathematics we may state that mathematical models in management form a part of narratives in a constructivist sense [McCloskey 1998; Kelemen, Rumens 2008]. Second, information is frequently applied as a dead metaphor. In consequence, an unlimited number of interpretations is possible [Lakoff 1987]. Subsequently, any epistemological considerations regarding information can extend as far as the foundations of language [Wittgenstein 2002]. The methodology applied in the paper is based upon a deepened survey of literature reflecting both major ideas from the past and the state-of-the-art knowledge about the concept of information [Molina Azorin, Cameron 2010]. The proposed approach allows for deepened interpretations of information, which in turn, can be helpful in a more profound understanding of the role of information and knowledge in modern management. The survey can also constitute a point of departure for comprehensive critical studies assessing the significance of information in management and for studying the intersubjective processes of assigning meaning to information

Information overabundance as the key determinant of modern management

The Information Society is described using characteristics that reflect the excessive volume of information and the difficulties arising from this phenomenon. Several terms are applied: information explosion, information abundance, information overload, and

information glut. The quantitative characteristics of these concepts show the scale of the deluge of facts and figures. Drawing inspiration from [Eppler, Mengis 2004; Gleick 2011; Melinat, Kreuzkam, Stamer 2014], the overwhelming volume of information produced and consumed in modern society may be described as a case of information overabundance. Its beginnings lie in the development of the internet, advanced search engines, Big Data analytics and social media. The consequences of information overabundance can be divided into two categories: source-related and recipient-oriented – fig. 1.

Figure 1. Components of information overabundance



Source: own research.

The phenomenon of information overabundance concerns not only the volume of information measured by the number of incoming/outcoming signals/bits. It also poses new challenges with regard to what we mean by the term "an increasing amount of information". In management theory the role of meaning is embedded in the discourse on sensemaking. In the present paper, only the concept of sensemaking devised by Weick [Weick 1995; Weick, Sutcliffe, Obstfeld 2005] is recalled.

The idea of sensemaking in management developed by Weick has already been widely discussed [Weick 1995; Weick, Sutcliffe, Obstfeld 2005; Maitlis, Christianson 2014]. In a review paper by Maitlis and Christianson [2014], even the task of defining sensemaking in management is affected by meta-sensemaking. According to Weick, such recursivity

constitutes the very sense of sensemaking: "The sensemaking perspective is a frame of mind about frames of mind that is best treated as a set of heuristics rather than as an algorithm" [Weick 1995, p. xii]. Awareness of the "sensemaking of sensemaking" is used to identify a limited collection of characteristics of information overabundance which potentially may influence both individual and collective sensemaking of information.

Typology of the conceptualizations of information

The term information is sometimes used with little, or even no attempt to distinguish it from two other affiliated notions – data and knowledge. Usually, the descriptive DIKW scheme (Data, Information, Knowledge and Wisdom) [Ackoff 1969] and Langefors' Infological Equation are applied [Langefors 1973] as a foundation for such distinctions. The differences between data and information, as well as between information and knowledge are fuzzy, sometimes contradictory, sometimes artificially sophisticated, which is visible in objective, subjective and intersubjective interpretations of data and information collected and analyzed by Checkland and Holwell [1998]. Similarly, the distinctions between information and knowledge are not easy to define [Kettinger, Li 2010]. In the present paper, the basic distinctions between data, information and knowledge as used in the DIKW scheme are applied, and, wherever necessary, deeper considerations are added.

Numerous surveys have been conducted on conceptualizations of information, e.g. [Checkland, Holwell 1998; Capurro, Hjørland 2003; Floridi 2004, 2011; Boell, Cecez-Kecmanovic 2011; Gleick 2011; Adriaans 2013]. Defining information entails chaos, disorder and a lack of logical coherence, as was underscored by Capurro and Hjørland [2003]. A fundamental challenge to defining information is posed both by its relationship to reality, i.e. the distinction between a representational and performative view of information, which is the central issue in the philosophy of information [Floridi 2011], and also by management practice [Boell, Cecez-Kecmanovic 2011]. The objectivist notion of information conveyed by signs assumes it is a true and objective representation of an event or a state of affairs. The subjective view on information according to which an individual perceives and interprets signs depending on his/her cognitive abilities and prior knowledge, assumes a subjective representation of reality. This challenge does not occur in daily management practices, but it is becoming an important issue in debates on the representativeness of information in the information systems applied in management.

An attempt to develop a comprehensive framework typology of the conceptualizations of information based on taxonomy theory has been undertaken by Boell and Cecez-Kecmanovic [2011]. Their framework typology includes the following approaches:

1. Physical: material and engineering.
2. Semiotic: objectivist, subjectivist, intersubjectivist.

The moderate constructivist approach adopted as the foundation of this study allows us to propose new approaches: objectivist non-semantic, objective-semantic, subjectivist, intersubjective universal and intersubjective constructivist. This change is based on two assumptions. First, information regarding a physical phenomenon is available to the observer in the form of signs (mathematical symbols), and second, in the case of management, just as in the social sciences in general, research is not extensive enough for us to conclude that: "information is the pattern of organization of matter and energy" [Bates 2006, p. 1033]. Similarly, any quantum theory-based understanding of information, e.g. [Lloyd 2007], is not applicable in social studies. The attempts that have been made to apply an objectivist view-based information theory in management as well as in Information Systems theory and practice are connected with the concepts of Shannon's negentropy as a measure of uncertainty in communication channels [Shannon 1948; Shannon, Weaver 1949] or with other physicalist concepts mentioned above and with their modifications within econophysics [Rosser 2016]. Any detailed analysis of the impact of information overabundance upon modern management would require book-length considerations. The overview from Table 1 can be used here solely as a basis for introductory comments supporting the initial conjectures.

Table 1. Extended overview of approaches to information

Approach	Definitions	Basic assumptions concerning information
Objectivist non-semiotic	"Information is the pattern of organization of matter and energy" [Bates 2006, p. 1033]. Information as a measure of uncertainty also applies as a measure signal transfer in communication channels [Hartley 1928; Shannon 1948; Shannon, Weaver 1949]. Brillouin's search for the links between information and physical entropy. This idea of linking thermodynamics with information theory was later regarded as disputable. The term negentropy is proposed [Brillouin 1962]. Information as the key element of the physical world in quantum mechanics [Lloyd 2007]. Algorithmic Information Theory (Kolmogorov complexity theory). Kolmogorov complexity: the information in a binary string x is the length of the shortest program p that produces x on a reference universal Turing machine U [Kolmogorov 1965; Chaitin 1987].	– exists independently of humans, – semantic aspects are irrelevant, – is measurable, – is context free.

Objectivist semiotic	"Signs carry objective information, but humans cannot access this" [Mingers 1995, p. 303]. Information is an objective, albeit abstract, feature of the world in the same way as physical objects and their properties are" [Mingers 1995, p. 295]. Information is processed data; data are raw "facts" that describe entities and their properties; they simply exist as recordings or traces of reality [Bellinger, Castro, Mills 2004]. Facts which are treated as true or false are objective. There is such a thing as objective information associated with facts (information as a commodity) [Dretske 1981]. Information as a consequence of distinction: "difference which makes a difference" [Bateson 1972, p. 453]. A synthesis of quantitative (hard) information and qualitative (soft) information. Semantic information: Bar-Hillel and Carnap [1953] developed a theory of semantic information. Floridi [2004, p. 561] defines semantic information as well-formed, meaningful and truthful data.	– exists independently of humans, – is embedded in signs, – is divorced from meaning, – is conveyed by signs and can be interpreted differently by individuals.
Subjectivist	"Information is inward-forming. It is the change in a person from an encounter with data. It is a change in the knowledge, beliefs, values or behavior of the person" [Boland 1987, p. 363]. "Information is the meaning produced from data based on a knowledge framework that is associated with the selection of the state of conditional readiness for goal-directed activities" [Kettinger, Li 2010, p. 415].	– is dependent on the individual, – is often related to cognition, – knowledge and values of individuals, – "caused" by stimuli, – does not acknowledge the context.
Intersubjective – universal	"Information is inherently bound closely with numerous phenomena – language, action, logic and technology" [Beynon-Davies 2009, p. 5] "information ... is a process of creating, adjusting and maintaining relationships among the participants in a drama or a real task" [Stamper 1991, p. 522].	- is dependent on the individual as part of a community, - is different for different groups; - is contextual, - is situational, - is part of a dynamic process.
Intersubjective – constructivist	Main question – is it necessary and possible to develop interpretive concepts of information? Information as a performative concept. An information system as a social construct [Askenäs, Westelius 2003] – a step towards viewing information as a social construct.	– information can be treated as a social construct in the sense proposed by Berger Luckman [1966], – overcoming barriers resulting from a multitude of different interpretations of information, – the main barrier – the meta-level character of information (information always defined by referring to information and knowledge) (nested definitions, recursive definitions).

Source: own research based on [Checkland, Holwell 2002; Floridi 2004, 2011; Boell, Cecez-Kecmanovic 2011; Adriaans 2013].

Information overabundance and conceptualizations of information in management

The above approaches to the concept of information cannot be isomorphically projected onto applications in management. Therefore, the impact of information overabundance on the application of different concepts of information in management should be scrutinized with regard to the following issues:

1. Interpretations of information – objective, subjective and intersubjective.
2. The precision of qualitative interpretations of information and their validity in human decision making and in man-machine interfaces.
3. The usefulness of information as a descriptive and predictive tool.
4. The accuracy of measuring and assessing the value of information as a commodity.

The usefulness of qualitative interpretations of information is limited in all cases where computer-based support systems are applied. In this case, relevant measures of information (preferable in ratio-scale) need to be developed. Usually, they are rooted in Shannon's ideas and their modifications. In more advanced studies reference to physical measures appears applicable [Rosser 2016]. Qualitative concepts of information raise two main challenges. Firstly, in interpretative applications insufficient attention is given to a deeper understanding of information. In such cases, studies do not focus on the sense of information but solely on the applications of utterance "information" in discourse. The second challenge is posed by the associated implementation of advanced systems of Artificial Intelligence. As input such systems require both quantitative information and qualitative interpretations of sufficient accuracy. AI systems deliver both qualitative and quantitative interpretations, which are solely valid when both kinds of precise information are provided. Information overabundance exacerbates problems with qualitative and quantitative interpretations since an increased volume of information is understood purely in qualitative terms, without sufficient reference made to quantitative aspects. Rather unusual, or even "sensational", measures of information overflow are published without any adequate reference to their meaning. All such phenomena make any kind of intersubjective concepts of information even more difficult to develop.

The most important expectation regarding information in management was the possibility of developing more or less accurate predictions. Obviously, the consequences of bounded rationality are well-known. Hence, the claims for information perfectness as in the game theory are of a different character nowadays. Firstly, perfectness is understood as an enhanced predictive capability of computer-supported decision making. Secondly, at the other extreme, in the case of interpretive approaches claims for predictability of management theory are treated as limited, if not possible at all [Czarniawska 1999].

The next issue concerning the impact of information overabundance on modern management is that of measuring information and assessing its economic value. Undoubtedly, this problem is also associated with that of measuring the intangible assets addressed in most studies on knowledge. Paradoxically, assessing the value of information treated as a specific commodity can be simpler than measuring knowledge. In the latter case, measurement is founded on various methods of operationalization. These methods may include measuring information. Subsequently, this means that in our era of information overabundance more attention should be paid to measuring and validating information than to reified metaphors as a way of depicting knowledge [Mesjasz 2016].

The final comment concerns the possibility of applying an interpretive approach to defining information in conditions of information overabundance. In this case, the increasing volume of information and the growing role played by man-machine interactions have given rise to two phenomena. Firstly, it has created new barriers to purely qualitative interpretations viewed in contrast to quantitative concepts of information. Secondly, it provides a platform for the development of new inter- and multi-disciplinarity, which will be based on the collective collateral efforts of, say, management specialists, linguists, IT specialists and experts in human and machine cognition.

Conclusion

The main general conclusion stemming from this paper is that conjectures concerning the impact of information overabundance upon conceptualization of information in management, have to a large extent been illustrated by the use of the extended typology elaborated in the paper. By definition, the results of the survey should be treated as a form of participation in an intersubjective meta-discourse on the role of information in modern management.

The more specific conclusions are as follows:

1. Information overabundance poses new challenges for qualitative and quantitative concepts of information in management. It makes theory and practice even more complex.

2. It is important to identify those areas where the application of advanced concepts of information in management are necessary as well as pinpoint their limitations. For example, it is worthwhile reflecting on whether the barriers to computation complexity arising from the concepts of Kolmogorov [1965] and Chaitin [1987] and mirrored in NP-complexity have any impact on the models applied in the theory and practice of management. By the same token, does it make any sense to refer to the ideas of Wittgenstein [2002] when applying an interpretative approach to developing qualitative ideas of information?

With regard to future research, two main areas are proposed, that would allow us to develop more advanced and applicable concepts of information:

1. Information overabundance along with the development of more advanced Information Systems, including Artificial Intelligence, are fueling a need for a new interpretative intersubjective approach to information in management which would change traditional objective, subjective and intersubjective approaches.

2. This new strategy should be based on a new inter- and multi-disciplinary approach, which can be developed solely through collective research conducted by specialists from different, and often distant, disciplines.

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From Agile Project Management to Agile Organization? – a Literature Review

Abstract: The concept of agility is one of the major trends influencing project management discipline in the last decade. The purpose of this article is to provide a literature review of the academic literature on agility. Based on the study five categories of research streams were identified: papers focusing on agile software development, papers related to agile project management research, contributions to agility on the organization level, contributions to the application of hybrid approaches, papers discussing application of agile methods for innovation. The major conclusion is that: while there is a relatively large body of research devoted to the discussion of the agility concept on a project level, research on an organizational level is relatively scarce. In the context of the todays' dynamic environment, agile project management may contribute to increasing the flexibility of organizations as well as better customer orientation. Thus it can serve as a dynamic capability in building organizational ambidexterity and helping to cope with innovation demands.
Key words: agile project management, agile organization, ambidexterity theory

Introduction

Agile project management is one of the major trends influencing project management discipline in the last decades. This trend is enforced by the dynamics of the current business environment [Bennett, Lemoine 2014; Pasmore 2010]. In the volatile, uncertain, complex and ambiguous environment and hyper-competitiveness on the markets, it is difficult and almost impossible for companies to maintain competitive advantage that is sustainable [D'aveni 1995; Wiggins, Ruefli 2005]. Thus to cope with competitive pressures firms need to succeed in markets where a range of non-price advantages are expected

by customers. Winning criteria in the today's market include: rate of innovation, fitness for purpose, volume flexibility, variety, extreme customization and, above all, rapid responsiveness [Meredith, Francis 2000]. Agile in project management helps companies to cope with these challenges [Gustavsson 2016]. In highly dynamic environment it is difficult to plan in advance and stick to the upfront formulated scope of projects. Thus the "agile" way of working on projects may significantly better suit project-based organizing than traditional, phased approaches. This is especially relevant for exploratory projects, where constant change and adjustments of the project's scope is necessary during the entire project management life cycle [Lenfle 2008; Lenfle 2014].

The initial literature review showed that there is a rich body of research on agile embracing practice-related, gray literature. However, problems of agile project management are not sufficiently reflected in the academic discourse. Another observation is that the majority of articles both in gray and academic papers relate to managing of a single project in an agile way. Surprisingly, very few papers discuss how agile project management may influence the entire organization and, on the contrary, what is necessary for the organization to manage projects in an agile way. This strategic, holistic perspective on the organization and project agility lacks sufficient reflection in the academic literature.

The purpose of this article is to review, categorise and critically assess the academic literature on agile project management and the agile organization.The research questions are: What is the current status of research on agile project management as well as agile organizations in academic literature? What further research directions may be drawn based on the findings? The study is a narrative paper based on an extensive literature review.

The paper is structured as follows. First, the theoretical background of the study will be presented. Then, the research methodology will be outlined. In the following steps, key results are summarized and discussed. Finally, areas for further research are outlined.

Theoretical background

The study is situated at the intersection of the organizational and strategic management theory [Killen, Jugdev, Drouin, Petit 2012]. Project management is perceived here as a dynamic capability of an organization supporting strategy implementation. Several academic papers discuss the two-way relations between strategy and structure as well as the phenomenon of deliberate and planned strategy. Both strategy and related projects can be emergent and deliberate in nature [Minzberg 1990; Ansoff 1991; Jamieson, Morris 2004; Longman, Mullins 2004; Srivannaboon, Milosevic 2006]. The basic assumption for

the discussion in this article is: Since projects support strategy execution, agile approach to project management may support agility in strategy execution allowing an organization to be more flexible at the strategic level. Thus agile project management may be perceived as a dynamic capability of the organization. In the context of managing projects in a dynamic environment, agile project management may help to create an ambidextrous organization able to leverage both exploration and exploitation capabilities while coping with environmental changes [Killen et al. 2012; Tushman, O'Reilly 1996].

Research Methodology

This research is based on a comprehensive literature review on agility concept related to project management and organizational theory. A literature review embraced broad search in the scientific databases focusing on management-related literature: Proquest, Emerald, EBSCO, as well as resources of Project Management Journal and International Journal of Project Management. Following key words were applied to the research: "agile", "agile project management", "agile organization". Initially, 324 articles were identified and reviewed. Then, articles were sorted based on the exclusion of conference papers, and non-peer-reviewed journals and book chapters. In the second step overlapping articles were removed as well as those, which did not include the word "agile" as a keyword, in the title or in the abstract. Final selection delivered 68 papers published in peer-reviewed academic papers. The papers were classified into five categories based on the content analysis. Excel tool was used for the preparation of the articles database, filtering, keyword analysis and articles classification.

Results

Due to article length restrictions, the research findings will be presented in a synthesized manner. The findings from the literature review were grouped into five categories: 1) papers focusing on agile software development, 2) papers related to project management literature, 3) contributions to the agile organization, 4) contributions to the application of hybrid approaches, 5) papers discussing the application of agile for innovation.

Table 1. Synthesis of the literature review

No.	Key category	No. of papers	Dates of publication (range)
1	Agile in software development	27	2001-2016
2	Agile project management	13	2009-2017
3	Agile organization	13	1999-2017
4	Agile in hybrid approaches	9	2002-2014
5	Agile in innovations	6	1999-2014

Source: own elaboration.

The richest body of literature on agile is rooted in the engineering discipline and it is mostly related to software development projects. In this category conceptual papers were found discussing drivers, styles of working, as well as barriers for implementation of agile practices on software development projects [Highsmith, Cockburn 2001; Cockburn, Highsmith 2001; Boehm, Turner 2005]. Important areas of research in this context are agile teams and what makes them successful [Cockburn, Highsmith 2001; Drury-Grogan 2014; Melo, Cruzes, Kon, Conradi 2013; Drury, Conboy, Power 2012]. Another stream of research are empirical studies on the acceptance and success factors of agile approaches implementation [Chan, Thong 2009; Chow, Cao 2008; Sheffield, Lemétayer 2013].

The second category of papers is rooted in the project management literature. An interesting observation is that the concept of agility appeared relatively late in the top academic journals on project management. However, the number of empirical studies on this subject increases in the last decade. While reviewing the papers we can find studies providing an inventory of the existing agile literature in order to define the 'agile' concept and find key areas for further study [Conforto et al. 2014]. They are voices emphasizing that project management discipline requires rethinking and paradigm shift [Saynisch 2010; Levitt 2011]. Interesting research stream on the role of improvising in an agile way of working has emerged [e.g. Leybourne 2009; Leyborune et al. 2014]. In addition, some researchers analyse the possibility of application of agile project management outside of the software industry and on large corporate projects [Conforto et al. 2014; Hobbs, Petit 2017].

The third category of literature is related to the agile organization. An interesting finding is that the concept of organizational agility was discussed earlier in the organization theory related papers, before the beginning of the agile movement in the software development industry. The concept of agility is rooted in the manufacturing and supply chain literature and appeared already in the late 90. Agility is discussed as dynamic capability important from the strategic perspective of the company [Yusuf, Sarhadi, Gu-

nasekaran 1999; Rigby, Day, Forrester, Burnett 2000]. However, in recent years there is a growing interest in this area and we can observe literature discussing the concept of agility on the organizational level, often in the context of organizational ambidexterity theory [Tallon, Pinsonneault 2011; Lee, Sambamurthy, Lim, Wei 2015].

The fourth category of papers discusses the possibility of integrating traditional project management approaches and agile approaches. Several authors confirm the possibility and benefits of integration of agile methods on a large project in larger firms. The conclusion is that methods synthesis is not only possible but can provide developers with a comprehensive spectrum of tools and options [Boehm 2002]. The agile methods applied for a traditional stage-gate approach to product development is beneficent because it can provide continuous feedback from the user or customer, gives the stage-gate model powerful tools for microplanning, day-to-day work control, and progress reporting [Runeson 2005]. Other researchers advocate that in the light of ambidexterity theory – integration of agile and traditional development is a viable solution to systems development organizations [Vinekar, Slinkman, Nerur 2006]. Another research confirms the finding and shows, that in unknown, unknowable environment combination of plan -based and agile approaches to requirement gathering on a project proves to yield the best results [Port, Bui 2009].

The last research stream identified during literature review is related to agile project management in the context of innovation management. The studies on agility in innovation start late 90 with the research on the importance of "gatekeepers" and "promoters" for the development of innovative products and processes. Having those roles significantly improves the agility and innovation potential in organizations [Hauschildt, Schewe 2000]. The concept of agility is being discussed as a firm's capability important for product innovation success [Najafi, Tavani, Sharifi, Ismail 2013]. Project management-related research discussed here the gains and challenges faced during the development of a method to plan and control innovative projects, using agile principles as well as how agile concept can be applied to the predevelopment stages of innovation [Gonzalez 2014; Conforto et al. 2014].

Discussion

Based on the presented findings we can draw several observations on how agile influences current organizational and project management academic discourse:

- *The discourse on the agility concept is strongly rooted in the software development.* The existing research on agile project management is strongly related to the software development industry. And basic unit of analysis are projects, teams, success factors and

various methods and techniques applied in software development projects. Only limited body of studies are exploring the importance of agile approaches in other industries [Comforto et al. 2014, pp. 21–34]. We can also observe that the academic software development-related literature on agile, which is quite comprehensive, developed rather separately from the project management literature.

- *Practice – theory gap*. While there is a large number of contributions by project management practitioners and so-called "gray literature" on agile approaches, academic research published in peer-reviewed journals is relatively scarce. This may reflect the fact that "agile" is currently relatively trendy buzzword attracting practitioners' attention. However, the academic world, especially project management scholars, were quite reluctant to perceive the concept of agility in project management as an interesting and sustainable subject of studies. Maybe this can be also explained by the newness of the phenomenon and possible difficulty to conceptualize constructs and collect reliable research data.
- *Agile approaches – enforcing paradigm shift*. There are several studies confirming the advantages of agile project management for improvement of project performance [Serrador, Pinto 2015]. This is also in line with market reports, e.g. Chaos Report confirms that project using agile methods are more successful than those conducted with traditional methods [Jonson 2016]. Thus it may be expected that implementation of agile practices will gain acceptance in the future and will be inevitable trend reflected both in practice and theory. Several academic studies emphasise the need for paradigm shift in project management and the necessity for embracing the agility concept as a way for coping with complexity and changes in the business environment [Levitt 2011; Saynisch 2010; Leybourne et al. 2014].
- *What does agile mean for managing organizations?* Interesting question from both practical and theoretical perspective is: Does agile approach to projects make the whole organization more agile? Is agility scalable from project level to the entire organization? Perhaps it is the other way around an organization needs to be agile to commit to agile projects or maybe this relationship works in both ways? We observe that in recent years the concept of agile goes beyond a single project, as a unit of analysis, and embraces the way the project portfolio is managed [Runeson 2005; Stettina, Hörz 2015]. Substantial research stream suggests that a combination of both traditional and agile approaches is a viable proposition, especially for large organizations, which need to balance the need of planning and reacting to emergent changes [Boehm 2002; Vinekar et al. 2006; Marcal et al. 2007; Port, Bui 2009].

To summarize, while there is a relatively large body of research devoted to the discussion of agility concept on a project level, research on agillity in the context of the entire organization is relatively scarce [Bottani 2010; Nold, Michel 2016; Tallon, Pinson-

neault 2011; Lee, Sambamurthy, Lim, Wei 2015]. Previous studies in project management concluded that there is a reciprocal relation between strategy and projects [Englund, Graham 1999; Srivannaboon, Milosevic 2006]. As agile project management practices emerge, they influence the way project portfolio is managed as well as the approach to the organizational strategy [Stettina, Hörz 2015; Runeson 2005]. Thus we may assume that the implementation of agile project management does not occur in a vacuum but it influences and requires adjustment to how the entire organization is being managed [Bottani 2010]. Thus this reciprocal relation between agility on the project and organization level is an interesting but not fully explored subject of study.

Conclusions

The study identified five research streams in the academic literature related to the agility concept: 1) papers focusing on agile software development, 2) papers on agile approaches related to project management literature, 3) contributions to agile organization, 4) contributions to application of hybrid approaches, 5) papers discussing application of agillity for innovation. Limitations of the study may result from the predefined scope of the literature under review. It can apply to both selected search keywords and databases. The research focused on databased publishing management literature: Proquest, Emerald, EBSCO and two project management journal with the highest impact factor: Project Management Journal and International Journal of Project Management. The exclusion of book chapters and gray literature from the review may also limit the full picture on the agililty phenomenon. Another database like Web of Science and Google Scholar might have been taken under review as well. However, the reviewed 68 papers retrieved may approximately reflect the nature of agile discourse in academic, peer-reviewed journals.

The study finds out that there is a research gap concerning linking agile projects with organization level. Interesting research area is how agile way of working on projects influences managing of project portfolios and the entire organization. What organizational competencies need to be developed to support agile project management? What characteristics does an organization need to have to support agile projects? What determines the necessity for an organization to take over agile approaches? How agile increases organizational capabilities related to innovation? These are only a few research questions, which can be pursued in the follow-up research.

The study provides more transparency into academic work on agile and may provide a foundation for further empirical research both qualitative and quantitative. From the practical point of view agile approaches are important topic for increasing organizational flexibility in a dynamic environment. This kind of alignment can increase the speed

of reaction as well as time to market for launching new products and services. Thus it may be assumed that adopting agility into organizations may contribute to increased level of organizational ambidexterity helping companies to be more effective in exploitation and exploration of new capabilities. From a practical point of view, this is a useful competency on the todays' market in many industires.

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Creating an Evolutionary Teal Organization on a Step-by-step Basis. A Case Study

Abstract: F. Laloux's concept describing organizational cultures of so-called turquoise organizations constitutes a very attractive narration; however, it focuses on describing the already existing organizations and isolated events from the beginnings of the creation of turquoise organizations. This article is an attempt to gain an insight into organizations, to show the successive stages of creating evolutionary turquoise organizations at the level of particular organizational processes.

The subject matter of the conducted analysis was a small educational sector organization; the research was carried out by means of the qualitative methods (a participant observation, a partly categorized interview); the plans of both the observation and the interview were based on the Reinventing Organizations Map model developed by the consultancy firm Circle43.

The analysis of changes taking place in the examined organization showed the tendencies occurring during the process of building an "evolutionary turquoise organization" such as leadership as a factor initiating the occurrence of a "critical mass" for green processes, the appearance of a single priority turquoise process based on the "critical mass of green processes", the repetition of the priority process as a stimulus for the spontaneous appearance of subsequent turquoise processes. Describing the step-by-step process of turquoise organization development, these tendencies may have a universal character going beyond the specificity of a particular sector.

Keywords: evolutionary teal organizations, F. Laloux's theory

Introduction

The concept of turquoise organizations seems to be one of the most attractive narrations about organizations in the recent years. This can be proved, among other things, by the number of translations and subsequent editions of the same book taking place in a short period of time as well as the appearance of new publishing forms (audiobooks, combinations of traditional books and comic books) dedicated to the topic of turquoise organizations [Laloux 2016]. As is noted by B. Czarniawska [2010], attractive narrations become the reality of social life.

On the one hand, the description of organizational cultures offered by F. Laloux [2014] is unusually clear and the presented model combines perfectly simplicity with elegance. The successive stages of the organizational development and social awareness are described by the color scheme, metaphor and a description of the functioning of the organization F. Laloux [2015b]. The Red type of organisation is described as metaphor of wolf pack; Amber – army; Oragne – Machine; Green – family; Teal – living organism. We can do easily "comfortable mental journey" form highly reactive, short perspective focused red organisation; by hierarchical pyramid of amber organisation; idols of profit and growth in orange organisation; jovial, egalitarian culture of green organisation; finally to self-management in teal organisation.

On another hand, the description offered by F. Laloux [2014] could be consider as "the old product in new attractive packaging". For example in 1980 Gareth Morgan's theory Images of Organization described similar phenomena: prison, political system, machine, culture, organism, brain [Morgan 2006]. Also some key words of Laloux's theory were described in second half of XX century, for example self-management is with details describes in Ken Blanchard's paradigm: Situational Leadership [Blanchard 2010; Hersey, Blanchard, Johnson 2015].

However, when we try to move from Laloux's description of an organization towards the issue of implementation, we find descriptions of existing organizations, selected critical points, and sources of risks. Even if the reader agrees with the statements included in the publication, they fail to get an answer to the following question: How could I implement this attractive scenario in my organization?

Another difficulty is that attractive and simple scenarios, as is observed by D. Kahneman [2012], are frequently untrue. This is so because they comprise such cognitive processes as cognitive ease [Kahneman 2012] or illusion of understanding [Kahneman 2012]. Based on these processes, we assume that one of the persons participating in a given situation makes right decisions, while the others remain passive. As far as such one-dimensional stories can be attractive for potential shareholders, they fail to explain the phenomenon from the point of view of social sciences. Thus, although F. Laloux's de-

scription of organizations appears to be unusually attractive, it can be illusory because of its simplicity – similarly to the illusory effect of the cognitive processes described by D. Kahneman.

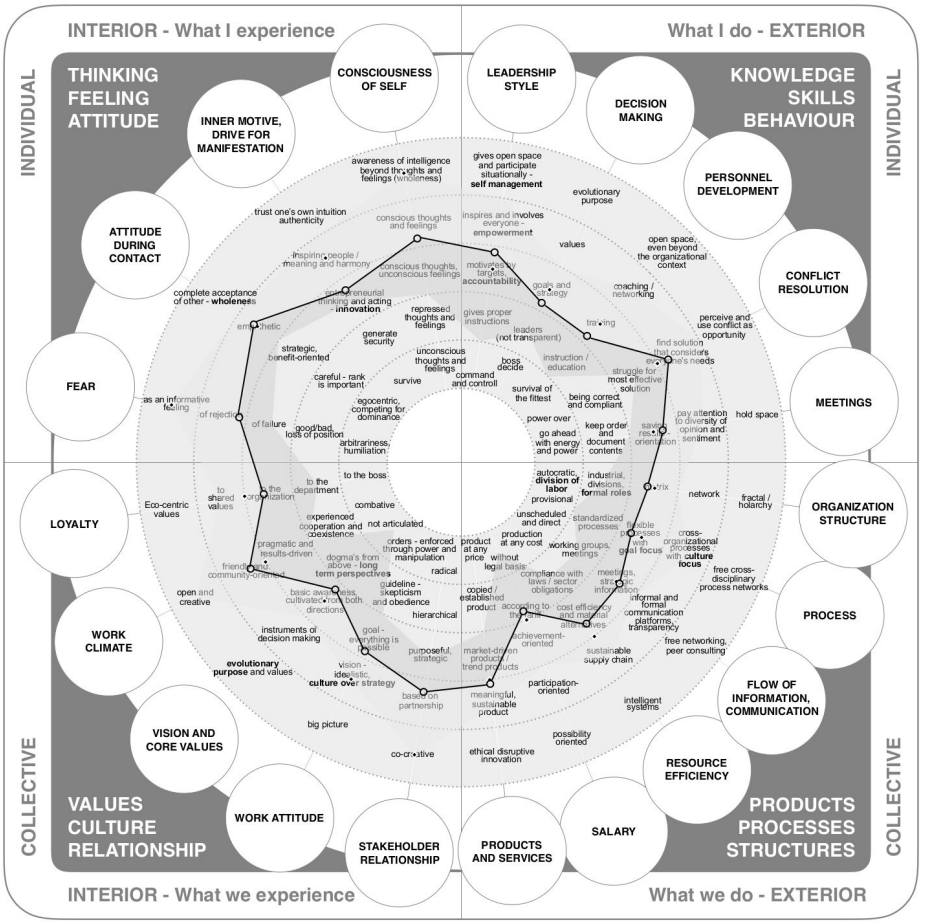
Furthermore, what is necessary to change an organization is not so much an attractive narration but rather changes in human behaviour, which is emphasized in change management [Cummings, Worley 2015]. Organizational changes towards evolutionary turquoise can result in demand for the identification and changes in employee behaviour and habits. As is noted by Ch. Duhigg [2013, p. 182]: "In every organization, key habits give rise to a culture, irrespective of whether their leaders are aware of this or not". Thus, a cultural change in an organization is connected also with a change in employee habits.

This article attempts to move an attractive narration to the level of describing particular organizational processes and human behaviour related to them. This attempt is based on the first few steps in the process of building a turquoise organization. This case study takes us from a "simple and attractive story" to the level of processes, actions, and results.

Theoretical background

As is noted by F. Laloux [2016, p. 34], the theory of the functioning of particular "coloured" organizations describes the types of "whole" organizations, but these models concern organizational processes, structures, and cultures. Therefore, it is difficult to state that a particular organization is 100% "orange" or "green". Referring only to processes, we can analyse, for example, recruitment, establishment of objectives, development of a budget, resources management or personnel development and declare the advantage of the processes of a given type ("colour"). The operationalization of understanding an organization as a "network filled with processes of different colours" [Laloux 2016, p. 34] leads to the use of an organization description model proposed by E. Szabolcs and M. Karoly from the Hungarian consultancy firm Circle43. This Reinventing Organizations Map is based on Frederic Laloux's book Reinventing Organizations, however (in the opinion of E. Szabolcs and M. Karoly), it goes beyond the breakthroughs mentioned in Laloux's study. For the purposes of this article, the 2.2. version of the map was used as published by its authors in April 2017 [http://www.reinvorgmap.com].

Figure 1. The Reinventing Organizations Map, version 2.2. (Reinventing Organizations Map – creative commons attribution-sharealike license; the author's additional consent to use the work of 26 January 2018)



Source: http://www.reinvorgmap.com; access: 2.02.2018.

Research methodology

Description of methods and procedure

For the purpose of analysing the organization described in this article, the author used a participant observation and a partially categorized interview [Sztumski 2005]. The participant observation was possible because the author is actively involved in the ongoing functioning of the school (in the capacity of chairperson of the association running

the school). The participants of the interviews were school managers (the headmistress and the administrative director), teachers directly responsible for project execution (2 persons), other teachers holding the position of form master (5 persons), and parents (6 persons). The interviews lasted from 30 minutes (parents), through interviews with a length of 2–3 sessions after 45 minutes (teachers), until the interviews with a length of 2–3 sessions after 90 minutes (managers). The interview referred to 20 categories specified in the Reinventing Organizations Map version 2.2.; these categories became points of reference for the areas discussed in the interview. Because of the broad scope of the tool, in some cases the interview was divided into two parts. In such cases, the two parts of the interview were separated by not more than 7 days. In view of the fact that the interviewer and the interviewees knew one another, although arranged by appointment, the interviews had an informal character and took place in circumstances natural for the interviewees (breaks between lessons; parents' meetings).

Description of organisation

The organisation under analysis is a public school in Będkowice; it is run by a parents' association, based on the managerial model. The school is managed directly by the headmistress (matters related to pedagogical supervision and curricular requirements imposed by the state) and the school manager (administrative matters connected with the functioning of the school). The overall functioning of the school is supervised by the chairperson of the parents' association (recruitment, employment and dismissal of employees, approval of expenditures, salaries). The teachers are guaranteed opportunities for professional advancement, in accordance with the same regulations as those applicable to other public schools.

As a public educational institution, the school does not charge the parents any tuition fees and relies on the educational grant from the state, which is based on the number of pupils attending the school, and on voluntary donations for the benefit of the association. In the forms from 0 to 7 there are approximately 60 pupils, with not more than 12 pupils in one form. In the same building, the school runs also 3 kindergarten groups of 20 children each.

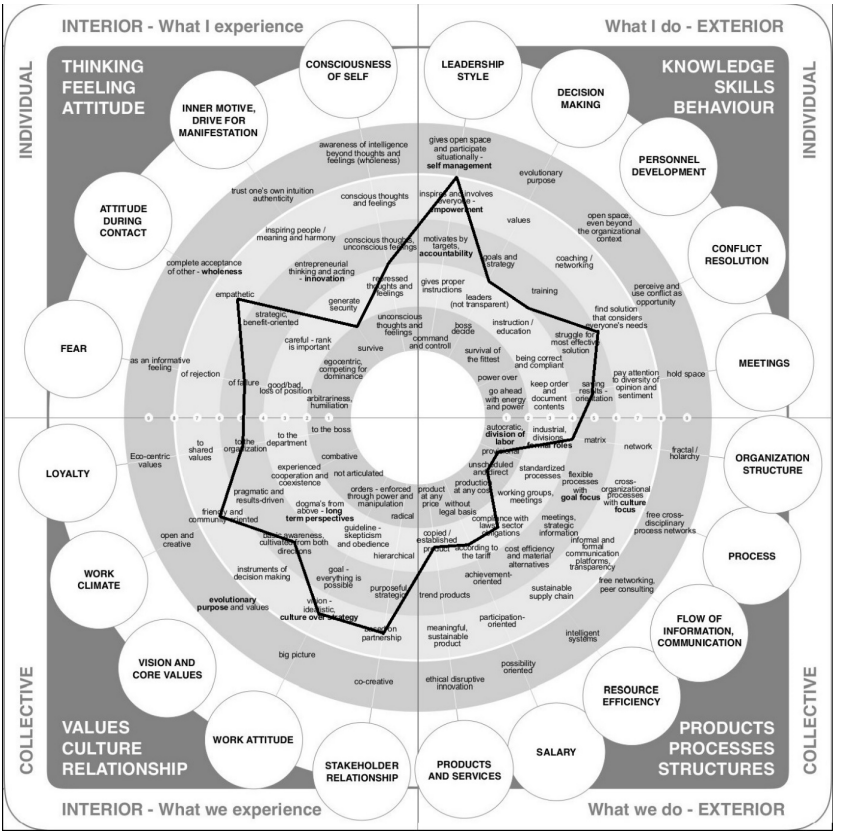
While Będkowice has had a school for over 100 years, it has occupied its present building since the 1970s. An important event in the organization's history was its acquisition by the parents' association from the commune in the year 2012. In consequence of this change, what remained was just the building and its equipment, while the teaching personnel and the management were replaced completely. In 2012 the school had 28 pupils; at present (2018) about 120 children attend the school.

Results and discussion

On the basis of the participant observations and the interviews, it was possible to identify the unique phases in the functioning of the organization:

Phase 1. "Just to survive and show others it was possible".
The phase is dominated by processes typical of amber organizations (pedagogical supervision requirements); there are many "red" processes (quick, authoritarian decisions characteristic of crises rather than the "violence-based" functioning of red organizations).

Figure 2. Phase 1 in the functioning of the organization described by means of the categories of the Reinventing Organizations Map version 2.2. (Reinventing Organizations Map – creative commons attribution-sharealike license; the author's additional consent to use the work of 26 January 2018).



 Source: http://www.reinvorgmap.com; access: 2.02.2018.

It should be noted that from the beginning of the existence of the organization its leadership style (see the leadership style dimension) has been perceived as a means of empowering the employees and has had a situational character (although the interviewees did not know the idea of empowerment, their descriptions indicated the adjustment of the managers to an employee's or the team's situation).

Another important element was the shaping of the organization's relationships with its internal and external customers (see the following dimensions: attitude during contact; stakeholder relationship). The interviewees emphasized the unique character of the relationships within the team (friendliness and the commonality of the work climate from the very beginning of the organization's functioning in its new shape) as well as partner relationships with the stakeholders (parents, sponsors, local authorities). The managers mentioned also the primacy of a certain idealistic vision ("The school for our children", "The school where we ourselves would like to spend time") accompanied by the lack of an operational strategy (see the work attitude dimension: vision – idealistic culture over strategy).

A completely new team of teachers recruited from among people with no professional experience was building a work climate characterized by friendliness and orientation towards community, cooperation and mutual support (see the work climate dimension). It can be assumed that this was due to the absence of any previous negative occupational habits, strong internal motivation to survive the difficult period (see the inner motive, drive for manifestation dimensions) and behaviour modelling used by the managers (a leadership style, attitudes towards the organization's stakeholders presented not so much in declarations as in everyday workplace situations).

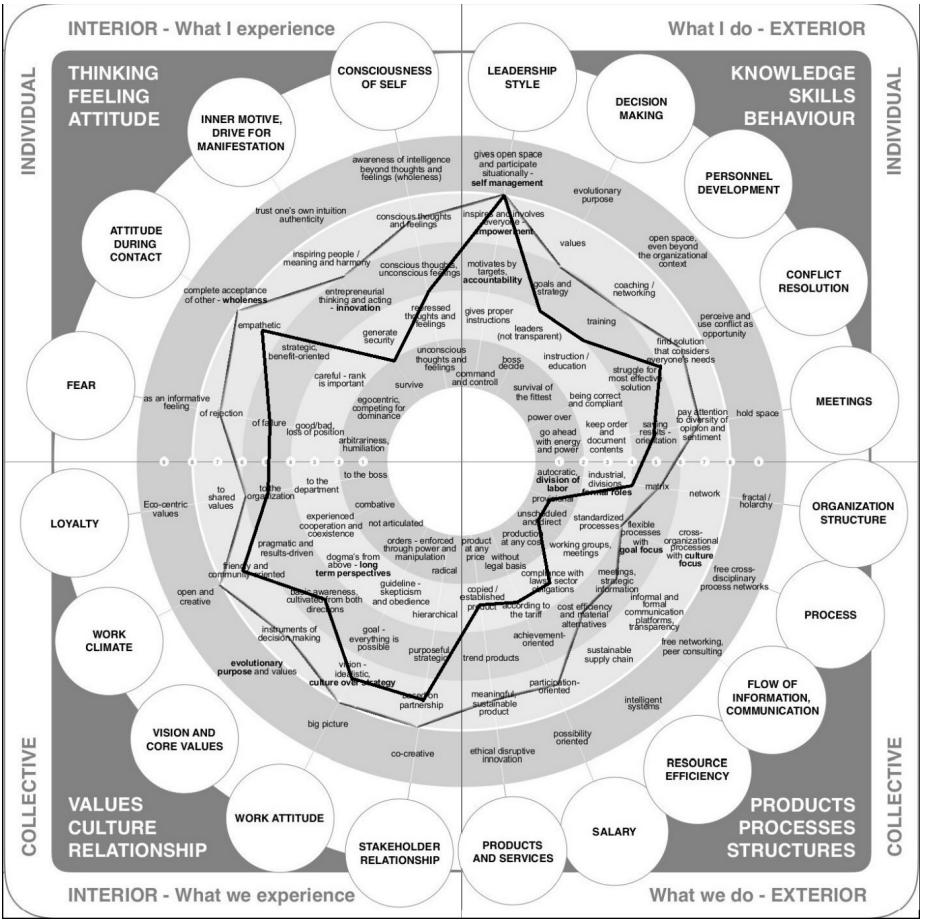
Therefore, it can be concluded that in this phase of the organization's functioning, we had to do with distinct germs of a "green organization" with respect to leadership, attitudes towards work, relationships within the organization, and relationships with the organizational environment.

Interpreting the situation in phase 1, we can state metaphorically that despite the domination of "amber" or even "red phenomena", "green processes" became, as it were, "leaven" for the organization's development towards "evolutionary turquoise".

Phase 2. "Common work is a value".

In this phase, what was symptomatic was the appearance of a considerable number of "green" processes with the simultaneous increase in the efficiency of managing amber processes (necessary because of the requirements related to pedagogical supervision and the organization's status of a public educational institution) as well as orange processes (connected with acquiring additional resources for the association running the school).

Figure 3. Phase 2 and phase 3 in the functioning of the organization described by means of the categories of the Reinventing Organizations Map version 2.2. (Reinventing Organizations Map – creative commons attribution-sharealike license; the author's additional consent to use the work of 26 January 2018).



Source: http://www.reinvorgmap.com; access: 2.02.2018.

In phase 2 there appear elements of green organizations mentioned by F. Laloux [2015a, pp. 45–48; 2016, pp. 38–39] and important for the building of evolutionary turquoise organizations in the future:

1. Empowerment

It can be assumed that on the basis of the previously occurring mutual support and management style oriented towards empowerment, the employees' attitudes start to show changes directed at "being inspired" (see the inner motive, drive for manifestation dimensions).

Together with such changes there develops a new way of thinking about employee remuneration (see the salary dimension) – the employees (through their representative) acquire full access and ability to make decisions with respect to the school's expenditures; thus it can be concluded that this is the case of orientation towards participation in the field of remuneration. On the one hand, the employees participate in making decisions concerning financial matters and, on the other hand, they control the school's expenditures. Hence it becomes clear to them whether pay rises are possible or not and what available funds are spent on.

2. An organizational culture based on shared values and inspiring goals

Values become an important element in decision making (see the decision making, loyalty dimensions); it is visible not only and not so much in formally declared values as in the employee recruitment, selection, promotion, and career path development processes.

Work climate becomes an important value for the employees (see the work climate dimension): one of the employees summarized this aptly, saying that, "in our workplace, it is as if we were on holidays".

Another element that undergoes change in the employees' awareness of themselves (see the consciousness of self-dimension); on the one hand, this influences their professional development in this organization (the school employed people without any previous experience), and, on the other hand, we can talk about the impact of the organization itself (through the managers' styles of management and behaviour modelling).

3. The perspective of all interest groups

Partnership with the stakeholders (see the stakeholders relationship dimension) comprises not only the teachers (shared decision making) and the parents (becoming aware of needs, managing expectations); the organization's stakeholders include also its sponsors (through their children, they often become the clients of the school's educational services) and the local authorities (thanks to positive feedback from the parents and addressed to the local authorities, the perception of the school changes towards the better). Despite the growing number of children, the pupils are also partners the whole time. While at the beginning of the school's functioning, when there were just two dozen pupils, it was possible to pursue the model of an "extended family" in relationships with them, at the development stage which is the subject matter of this analysis, this takes place thanks to behaviour modelling exercised by the management team (shaping the teachers' attitudes) and the careful recruitment and selection of candidates for teaching positions (candidates' initial attitudes).

Furthermore, taking into consideration the elements mentioned by F. Laloux [2015a, pp. 59–66; 2016, pp. 38–39] as important for the building of evolutionary turquoise organizations, the following elements appear in phase 2:

1. "Values / an internal sense of rightness as a compass": In their lives, the people managing the school are guided by very similar values.
2. "Overcoming the fears of the ego": Because of their life experience, they are able to look at themselves from a distance; during the first years of the school's functioning the management team built mutual relationships based on trust and, consequently, they tend to build similar trust-based relations with other people.
3. "Relying on one's strengths": moving from "the paradigm of not having to the paradigm of strengths" was reflected
4. "Longing for completeness": We do not come across as grandiloquent phrases as is implied by F. Laloux [2016, p. 39], however, for the managers, the school becomes a way of life, a place which consciously "creates culture for the community".

Phase 3. "An accidental, unnoticeable breakthrough".

Pioneering for the organization, the turquoise process was connected with a standard (as in "amber" organizations) annual obligation. However, the process itself and its final result went very much beyond the scope of amber, orange or green organizations. Because the school under analysis had been functioning as a "green" organization (as described in phase 2) for about a year, it was doing things that were important for itself and for "our children". It turned out that the permanent ("amber") obligation to organize a school excursion had become a unique milestone in its development: "the excursion of our dreams". Like in a turquoise organization, everybody having interest in the results of the undertaking was involved in the process of making decisions about and organizing "the excursion of our dreams". This means that the children, their parents, the teachers, managers and sponsors participated in the decision making process. Thanks to the active involvement of all parties in the decision making process, the final result exceeded their original expectations and was observed with considerable attention by other schools and the neighbouring communities (during the excursion itself the school's website was visited more than 2 000 times a day).

It appears that phase 3 results directly from phase 2, in which the school as an organization became saturated with processes of a "green" character. The appearance of the turquoise process went unnoticed; it was to some extent the consequence of a certain "critical mass of green processes" in the organization. The appearance of the turquoise process did not cause any "earthquake" or "Copernican revolution" in the organization. There was no change in the organization's functioning with respect to

the Reinventing Organizations Map (thus fig. 3 describes both phase 2 and phase 3). However, the repetition of the same turquoise process in the following year caused the spontaneous start-up of subsequent "turquoise" processes, which is described in phase 4 of this case study.

Phase 4. "The ship on course towards the turquoise islands".
While the first turquoise process was, as it were, the result of a coincidence or " a critical mass of the green processes taking place in the organization", the subsequent turquoise processes constituted a conscious process of increasing their number based on the employees' initiative. The employees themselves proposed innovative methods of conducting classes and an innovative system of motivating pupils to exceed their own limitations. Such initiatives occurred simultaneously with the transformation of the organization itself (see fig. 4). There appeared such phenomena characteristic of turquoise organizations as:

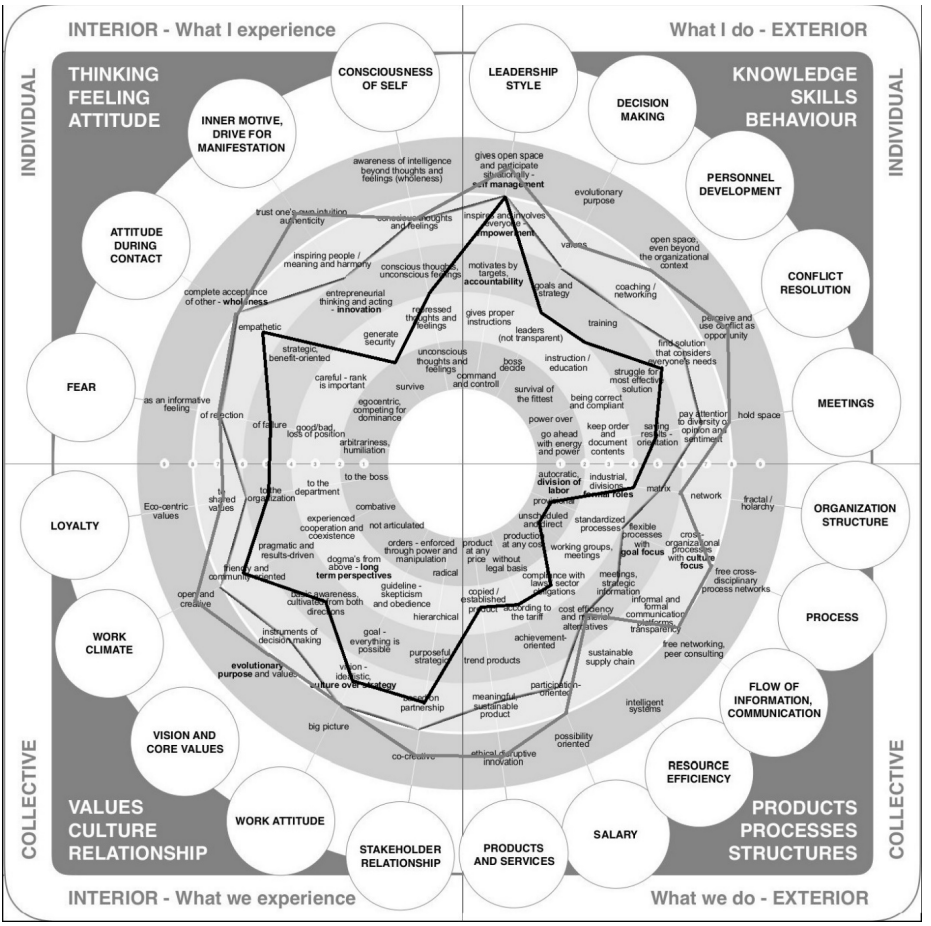
1. Self-government: there occurred a liquid structure (formally, there are three teams and managers – a requirement for a school as an ember organization); however, from the functional point of view, what we witness is liquid movement among the systems, changing responsibility, and collective creation of knowledge.

2. Completeness: working for the organization allows one to discover who one is and to develop oneself; the people working for the school share their passions with the pupils (as this is described by Laloux [2016, p. 55] "they shed their masks of *the professional I*"

3. Evolutionary purposefulness: changes in the organization's environment (changes in the system of education, modifications in the grant amount) make it difficult for the employees to "listen to themselves and understand which way the organization is heading naturally" [Laloux 2016, p. 55].

4. Additionally: the values and other elements making up the organizational culture become attractive for the local community (more and more people participate in the school's regular events; occasions such as "The Nativity Play", "The Day of Our Grandmas and Grandpas" attract now five times more participants than at the beginning period of the school's functioning)

Figure 4. Phase 4 in the functioning of the organization described by means of the categories of the Reinventing Organizations Map version 2.2. (Reinventing Organizations Map – creative commons attribution-sharealike license; the author's additional consent to use the work of 26 January 2018)



Source: http://www.reinvorgmap.com; access: 2.02.2018.

It is worth having a closer look at phase 3 and phase 4 because they can indicate model of a "step-by-step" process of consciously shaping a turquoise organization. It appears that the factors which facilitated the appearance of a turquoise process are as follows:

- A considerable degree of the organization's saturation with processes at the level of "pluralistic green".
- After achieving a certain "green critical mass", generating a turquoise process, "the turquoise snowball starts to roll down".

- Similarly to competence development systems, repeating at least one turquoise process becomes a development priority and causes the development of other areas towards evolutionary turquoise (similarly to competence development systems, when we learn communication skills, we will very likely develop competences in such areas as giving presentations, conducting negotiations, assertiveness or team work).

Additionally, besides phase 3 and phase 4, it seems that the important role was played by organizational leadership oriented towards a situational approach to management aimed at employee empowerment. Hence, despite the school's initial difficult economic position, the organizational processes were changing from amber or even red ones in the direction of a "green organization".

Conclusions

It appears that the following observed processes:

- a considerable role (characteristic at least of "green organizations") of organizational leadership from the very beginning of the functioning of the structure,
- the creation of "a critical mass for green organizational processes",
- the appearance and repetition of a single turquoise process as a developmental priority,
- the appearance of subsequent turquoise processes in consequence of the existence of a single turquoise process consistently executed in the organization
- can have a universal character as the first steps in the "step-by-step" process of creating an evolutionary turquoise organization.

Obviously, it is necessary to keep in mind the organization's limitations (a primary school), size (originally it was a relatively small organization) as well as the specific character of the public sector as a management environment. It seems, however, that even if the conditions were specific, then (metaphorically speaking) they made it possible to observe the processes of building a new type of an organization as if "on a Petri dish in a laboratory".

As far as managerial implications are concerned, we face a considerable significance of organizational leadership. It seems that the observed phenomenon of the existence of leadership of a situational character and oriented towards employee empowerment is of key importance. The individual maturity of the managers and their shared values are further important elements. This particular model of management made it possible to move the organization towards participation in the relationships of all employees and partnership with the stakeholders.

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ISO 26000 among Other ISO Standards

Abstract: The aim of this paper is to discuss whether and to what extent the provisions of the standard ISO 26000 may provide guidance to organisations in the implementation of corporate social responsibility. It also presents the basic differences between ISO 26000 and other standards SA8000, GRI, AA1000, ISO 14001, ISO 9000.

The paper presents the various CSR standards. The article is based on written sources, regulations and literature of subject.

Awareness of corporate social responsibility through its recently intensified promotion has reached such a level that it is no longer a problem whether to implement the concept of corporate social responsibility, but how to do it. Because of the high profile of ISO within the business community, the decision by ISO to develop an SR standard represents a significant opportunity to "mainstream" the concept of social responsibility to a wide section of businesses and other organizations that have not heretofore been reached through the specialized SR rule instruments of other entities. The fact that experts from Account Ability (developers of AA 1000), Global Reporting Initiative (GRI), the UN Global Compact (UNGC), Social Accountability International (SA 8000), the Organisation for Economic Cooperation and Development (OECD, responsible for the OECD Multinational Enterprise Guidelines), the International Labor Organization (ILO, responsible for the ILO Tripartite Declaration) and other international SR rule proponents participated in the ISO 26000 working group can be seen as recognition by these other SR rule developers of the bridging (and hence "mainstreaming") potential of ISO 26000.

However, ISO 26000 is the new rule, the problem itself is not. The Article shows similarities and differences between standards and discuss whether certification is crucial to improve the organizational performance to comply with the requirements of various standards.

Key words: ISO, corporate social responsibility, quality management, SA 8000, GRI, AA1000

Introduction

Actions taken by organizations in the field of social responsibility are usually not fully structured. Individual actions that are taken, however, are not components of a fully formed, coherent long-term strategy. Difficulties in developing a coherent strategy are often a tough barrier to cross, especially for small organizations, those with no experience or good understanding of the role that corporate social responsibility can play in developing relations with stakeholders. The increasing importance of high quality and the expectations of stakeholders demand a better systematizing of CSR practices.

The aim of this paper is to discuss whether and to what extent the provisions of the standard ISO 26000 may provide guidance to organizations in the implementation of corporate social responsibility. Other standards would be presented to show the background of the environment in which the ISO 26000 standard covers the needs of social responsibility more widely. The specific objective is to assess whether we can distinguish a specific type or size of organisations for which ISO 26000 turns out to be of special assistance.

The scope of this research is limited to the most prominent voluntary standards in quality.

In developing this text, case studies from several countries as well as literature studies were used. In order to explain the issue the author relied on the introduction to the issues of quality as well as the detailed provisions of ISO 26000.

The genesis of requirements and quality standards

In recent decades a greater weight has been placed on quality management, or Total Quality Management (TQM), which means giving quality a strategic treatment in a company. Nowadays, however, with the increase of the share of services in GDP, quality management systems are used in basically any organization or institution. We are witnessing a breakthrough, in which the concept of quality control has been extended beyond strict production and its effects; it has also included other products, processes, operations and systems [Hamrol, Mantura 2002].

Similarly to TQM, CSR has evolved from a theory implemented in a few companies to a concept that is virtually inextricably bound with business. While TQM requires the joint work of all sub-systems of an organization, CSR values are passed in full and bring an organization benefits when a long-term strategy of coherent actions is adapted.

Organisations and social responsibility

Corporate social responsibility is derived from the theory of business and society by Wartick and Cochran in which they criticize the neoclassical tradition of growth-based economy where profit maximization within legal limits is the sole responsibility. This tradition is opposed by multidimensional efforts for society, which result in increased competitive advantage [Wartick, Cochran 1985].

Growing public expectations towards social responsibility, associated with historical changes, led to increased public awareness about potential actions of organizations for the benefit of their internal and external stakeholders and the environment. It is still the essence of the problem, however, how to implement social responsibility objectives in such a way that both social expectations and intentions as well as capabilities of an organization are fulfilled.

The idea of social responsibility has its roots in a number of historical breakthroughs, and it is linked to the progressing development of civilization. Awareness of both societies and management boards of companies, through the recently intensified promotion of the idea of corporate social responsibility, has reached such a level that it is no longer a problem whether to implement the concept of corporate social responsibility, but how to do it [Zerk 2006].

The term "corporate social responsibility" is determined by the meaning of the three words: society, responsibility and business. It means the relationship between a company (or more broadly – an organization) and the community. It describes the scope of responsibility expected on both sides of the relationship. "Community" should be understood as broadly as possible to include all stakeholders of organizations, and can even be extended to include the natural environment [Geryk 2016].

Four consistent areas of responsibility blend here: shareholders who must be certain of an acceptable return on invested capital, employees who must be provided with decent working conditions, be supported in their development as well as incorporated in their organizations and provided with social care, customers who need to be offered products and services of specified quality and at the right price, and finally – society whose sense of respect, safety, environmental protection and social aspirations should not be violated by the interests of companies [Żemigała 2007].

The implementation of the CSR concept may in fact lead to the achievement of specific and measurable benefits in the form of [Mandl, Dorr 2007]:

- a rise in the level of employee motivation,
- increased brand awareness,
- an increase in trust in the organization, its products and services,
- a higher level of acceptance of the environment caused by the orientation of organizations towards social issues.

Variety of quality management standards

The first standards related to quality management, sustainable development and social responsibility began to emerge in the 1990s. Their content has evolved along with the development of ideas and specific expectations of stakeholders. The following standards are among the most important adopted systems which preceded ISO 26000.

SA8000 is one of the first standards promoting social norms in favor of decent work in all sectors of industry. It is based on the UN Declaration of Human Rights, conventions of the ILO, UN and national laws. This standard is auditable and was created to find a common language for measuring social productivity. What is needed is commitment of the entire management system in order to establish and implement procedures that comply with the standard and are constantly verified.

The Global Reporting Initiative (GRI) promotes reporting social activities, and publishes guidelines on how it should be done. A unified reporting system is also useful in comparing the performance of regions, industry sectors, industries and companies. The GRI Guidelines were developed in consultation with stakeholders representing many parties.

Account Ability's AA1000 series regulates issues related to management, business models and organizational strategies in terms of raising their accountability, responsibility and sustainability. AA1000 Standards have been developed for green low-carbon economies and to support integrated reporting.

The series includes:

- The AA1000 Account Ability Principles Standard (AA1000APS) that provides a framework for an organization to identify, prioritize and respond to its sustainability challenges;
- The AA1000 Assurance Standard (AA1000AS) that provides a methodology for assurance practitioners to evaluate the nature and extent to which an organisation adheres to the Account Ability Principles;
- The AA1000 Stakeholder Engagement Standard (AA1000SES) that provides a framework to help organizations ensure stakeholder engagement processes are purpose driven, robust and deliver results [/www.accountability.org/standards].

ISO 14001: 2004 specifies requirements for an environmental management. This only applies to those environmental aspects which an organization identifies as possible to control and to those which can be influenced.

Accession to ISO 14001: 2004 is made independently by:

- declaration,
- confirmation of the fulfilment of assumptions by a stakeholder,
- the system is certified externally.

ISO 9001: 2008 specifies requirements for a quality management system. It is used when an organization wants to prove that its product meets the requirements of customers. The purpose of this system is to increase customer satisfaction through continuous processes and products supervision and increasing their quality to customer satisfaction.

A comparison of ISO 9000 and ISO 26000 offered several highlighted areas in which ISO 26000 moves ISO 9000 toward CSR Excellence. The most significant is the shift from customer basis toward wider stakeholder base. This per se does not represent anything new in the field of management. What is significant, though, is a description of what this actually means –developed for the first time through a multi-stakeholder dialogue at the international level.

ISO 9000 sets the basics of process based and systems thinking in terms of defining the elements of a quality management system and defining eight quality management principles. The ISO 9000 family if often seen as a starting point in a journey toward business excellence (Ho & Fung 1994) and CSR Excellence. This often means that ISO 9000 (or quality management systems in general) are understood as a building block that gives a platform to integrate other systems or requirements and/or to expand toward wider business developments [Castka, Balzarova].

The research from ISO 9000 certified organizations suggests that ISO 9000 is utilized primarily to address quality improvements, customer satisfaction and improvement in corporate image [Castka, Balzarova 2006; Corbett, Luca 2002]. However, these studies also show that ISO 9000 is not very much used in areas that are important for CSR excellence; namely, relations with communities correlations with authorities and environmental improvements. In other words, ISO certified companies mostly use ISO 9000 to drive their operations and to create management systems supporting their operations.

Aspects of the ISO 26000 standard

The ISO 26000 standard, as an example of global regulatory mechanism in CSR, has been developed through a multi-stakeholder process and is non-certifiable standard [Tuczek, Castka, Wakolbinger 2018].

In its assumptions, the ISO 26000 standard was to serve as a guide leading from social responsibility to ethical practices of organizations. Most importantly, it does not have the nature of a technical standard. Among many regulations laid down by the International Standard Organization in Geneva only this particular one offers advice on its implementation, recommendations, and it also suggests some possible solutions. Due to the multitude of organizations, cultural backgrounds and national contexts in which

they exist, this standard may find a wide application. Its most important characteristic is the absence of the need or obligation to certify it by an external entity. It is more like a set of instructions showing how to increase an organization's commitment to actions perceived as socially responsible.

It has to be mentioned, however, that the pressure on certification is very high. It is such a popular and profitable business that a certification institution based in Hong Kong issued the ISO 26000 certificate exactly the moment when only a working version of this norm was published. Another institution, from Switzerland, issued a certification a few months before the date of publication of the official text of the norm [Gürtler 2012].

ISO 26000 was adopted in 2010 as a set of international guidelines covering all activities of organizations in the field of social responsibility. It was created as a result of five years of arrangements and discussions in more than 90 countries around the world. Relationships of stakeholders with national authorities, NGOs, business communities, trade unions as well as supranational organisations were negotiated [Ward 2012].

The ISO 26000 standard consists of seven main, interrelated elements, illustrating the relationship of organizations with their environments. These elements are presented in Table 1.

Table 1. An outline of ISO 26000

Clause title	Clause number	Description of clause contents
Scope	Clause 1	Defines the scope of ISO 26000 and identifies certain limitations and exclusions.
Terms and definitions	Clause 2	Identifies and proves the definition of key terms that are of fundamental importance for understanding social responsibility and for using ISO 26000.
Understanding social responsibility	Clause 3	Describes important factors and conditions that have influenced the development of social responsibility and that continue to affect its nature and practice. It also describes the concept of social responsibility itself—what it means and how it applies to organisations. The clause includes guidance for small and medium-sized organisations on the use of ISO 26000.
Principles of social responsibility	Clause 4	Introduces and explains the principles of social responsibility.
Recognizing social responsibility and engaging stakeholders	Clause 5	Addresses two practices of social responsibility: an organisation's recognition of its social responsibility, and its identification of, and engagement with, its stakeholders. It provides guidance on the relationship between an organisation, its stakeholders and society, on recognising the core subjects and issues of social responsibility, and on an organisation's sphere of influence.
Guidance on social responsibility core subjects	Clause 6	Explains the core subjects and associated issues relating to social responsibility. For each core subject, information has been provided on its scope, its relationship to social responsibility, related principles and considerations, and related actions and expectations.

Guidance on integrating social responsibility throughout an organisation	Clause 7	Provides guidance on putting social responsibility into practice in an organisation. This includes: understanding the social responsibility of an organisation, integrating social responsibility throughout an organisation, communication related to social responsibility, improving the credibility of an organisation regarding social responsibility, reviewing progress and improving performance and evaluating voluntary initiatives for social responsibility.

Source: ISO [2014].

The standard ISO 26000 can act as a reference point for assessing the degree of the involvement of an organisation in building the expected relationships with its environment. An evaluation of such activities in the mining and metallurgical sector in Poland may serve as a good example. It was also stressed that pro-social activities may provide an important competitive advantage by strengthening the relationships with stakeholders, improving the reputation and a growth of confidence, which, in terms of investor relations, brings measurable benefits [Bluszcz, Kijewska 2015].

The comparison of standards is presented in table 2.

Discussion

ISO 26000 and its usefulness, is, in some cases, questionable. The research report on comparing reports showed that organizations can selectively report successful CSR initiatives or underreport those controversial ones [Sethi, Roverpor, Demir 2017]. Another critical views underline the cost and time-consumption of the implementation process for smaller companies, and missing the environmental context for different sectors of the economy [Hemphill 2013].

It is also worth mentioning that ISO 26000 is the most controversial ISO's set of standards [Wood 2012]. It is supposed to be difficult for corporations as it is "too broad" and "too generic" [Perera 2008].

The focus of ISO 26000 is not only to operationalize social responsibility, but to reconceptualize "social responsibility". Therefore, it is less organizational-centric than, for example ISO 14001, focused on management systems in organizations. The standard itself may successfully contribute in the diffusion of knowledge and raising awareness about CSR, but higher level of an organizational-centric scope should be recognized [Castka, Balzarova 2008].

Table 2. Comparison of all the standards

Standard	SA8000	GRI	AA1000	ISO 26000	ISO 14001	ISO 9000
Frist / Last version	1999 last version: 2014	1997 last version: 2013	1999 last version: 2008	2010	1996 Last version: 2015	1987 Last version: 2015
Construction	One standard. Three clauses: Introduction (about the purpose, scope and way to implement); Normative Elements and Their Interpretation (laws that address the same issue); Definitions; Social Accountability Requirements (Criteria).	G4 Guidelines: The purpose of the GRI Sustainability reporting guidelines; How to use the guidelines; Criteria to be applied by an organization to prepare its sustainability report "in accordance" with the guidelines; Reporting principles; Standard disclosures; Quick links; Definition of key terms.	Three Standards: 1. AA1000 Account Ability Principles Standard (AA1000ASP) (theory); 2. AA1000 Stakeholder Engagement Standard (AA1000SES) (framework for Assessing, Designing, Implementing and Communicating stakeholders engagement); 3. AA1000 Assurance Standard (AA1000AS) (evaluating the adherence of an organisation).	One norm: Scope; Terms and definitions; Understanding social responsibility; Principles of social responsibility; Recognizing social responsibility and engaging stakeholders; Guidance on social responsibility core subjects; Guidance on integrating social responsibility throughout an organization; Examples of voluntary initiatives and tools of social responsibility (Annex A); Abbreviated terms (Annex B).	Part of ISO 14000 family	Part of ISO 9000 family
Purpose	The standard is to provide an auditable, voluntary standard to empower and protect all personnel within an organisation's control and influence who provide products or services for that organisation.	G4 therefore offers a globally relevant framework to support a standardized approach to reporting, encouraging the degree of transparency and consistency that is required to make information useful and credible to markets and society.	The purpose of this standard is to establish the benchmark for good quality engagement of stakeholders.		ISO 14001 is an internationally agreed standard that sets out the requirements for an environmental management system. It helps organizations improve their environmental performance through more efficient use of resources and reduction of waste, gaining a competitive advantage and the trust of stakeholders.	The standards provide guidance and tools for companies and organizations who want to ensure that their products and services consistently meet customer's requirements, and that quality is consistently improved.

Definition of Corporate Social Responsibility			Accountability is acknowledging, assuming responsibility for and being transparent about the impacts of your policies, decisions, actions, products and associated performance. The basic premise is that an accountable organisation will take action to: - establish a strategy based on a comprehensive and balanced understanding of and response to material issues and stakeholder issues and concerns; - establish goals and standards against which the strategy and associated performance can be managed and judged, and disclose credible information about strategy, goals, standards, - performance to those who base their actions and decisions on this information.	The responsibility of an organization for the impact of its decisions and activities on society and the environment, through transparent and ethical behaviour which: • contributes to sustainable development, including health and well-being of society; • takes into account the expectations of stakeholders (individuals or groups that are interested in decisions or activities of the organization); • complies with the applicable law and is consistent with international norms of behaviour; • is implemented throughout an organization and practised in its actions within its sphere of influence.		

Category	Child labour; Forced or compulsory labour; Health and safety; Freedom of association and right to collective bargaining; Discrimination; Disciplinary practices; Working Hours; Remuneration; Management system.	Economic; Environmental; Social (labour practices, human rights, society, product responsibility).	Stakeholders	Organizational governance; Human rights; Labour practices; The environment; Fair operating practices; Consumer issues; Community involvement and development.	Environmental policy; Environmental aspects; Environmental legal and other requirements; Objectives and targets, their programs; Resources, roles, responsibilities and authorities; Competence, training and awareness; Communication; Documentation; Document control; Operational control; Emergency preparedness and response; Monitoring and measuring; Evaluation of compliance; Non-conformance, corrective and preventative action; Records; Internal ISO 14001 audits; Management review.	Customer focus; Leadership; Involvement of people; Process approach; System Approach to management; Continual improvement; Factual approach to decision making; Mutually beneficial supplier relationships.
Stakeholders	It is not the main issue. The organisation shall participate in stakeholder engagement in order to attain sustainable compliance with the SA8000 Standard.	The organization should identify its stakeholders and explain how it has responded to their reasonable expectations and interests.	The purpose of this standard is to establish the benchmark for good quality engagement of stakeholders.	Stakeholders identification and engagement as one of the two fundamental practices of social responsibility.	2015: The addition of a stakeholder-focused communication strategy. Currently in clause 4.2 require that you determine the interested parties relevant to the specific management system and their relevant requirements. All revised standards follow a common structure, and definition of stakeholders was added: interested party (preferred term), stakeholder (admitted term), person or organization that can affect, be affected by, or perceive itself to be affected by a decision or activity.	Currently in clause 4.2 require that you determine the interested parties relevant to the specific management system and their relevant requirements. All revised standards follow a common structure, definition of stakeholders was added: interested party (preferred term), stakeholder (admitted term), person or organization that can affect, be affected by, or perceive itself to be affected by a decision or activity.

Reporting	Not required	The GRI Sustainability Reporting Guidelines offer Reporting Principles, Standard Disclosures and an Implementation Manual for the preparation of sustainability reports by organizations.	Describes rules of reporting	The ISO 26000 guidance says that social responsibility reports should "present the organization's operational performance… in the context of sustainable development".	About communication: The organization shall determine the internal and external communications relevant to the XXX management system, including: on what it will communicate; when to communicate; with whom to communicate; how to communicate. ISO 14063–environmental Management–Environmental Communication–Guidelines and Examples	4.2 Document your system to say how it should work. 4.2.1 Write documents including a quality policy, objectives, manual, procedures and records; decide what procedures you need for your system; must include those listed below.

Source: author's elaboration.

Conclusions

ISO 26000 is designed to be compatible with existing ISO standards including ISO 9001 and ISO 14001 (although ISO 26000 is not itself a management system standard capable of certification). Thus, TNCs and other organizations that are currently using ISO 9001 and ISO 14001 standards may be well-positioned to apply ISO 26000, since the approach of ISO 26000 is aligned with ISO 9001 and ISO 14001. In short, ISO 26000, as a follow-on ISO standard to the ISO 9000 and ISO 14000 series, has a pre-existing platform at a conceptual/intellectual level, and at the level of marketplace recognition and acceptance (legitimacy and authority) by organizations around the world. The incorporation in ISO 26000 of the basic "plan-do-check-act" approach found in the ISO 9000 and ISO 14000 series of standards 18 is an example of how ISO has transposed in a bottom up fashion key concepts from private standards of narrow application (quality management and environmental management) to apply to the broad SR subject matter that is the focus of ISO 26000.

In terms of the profile of ISO and its standards in the business community, it is instructive to compare usage of its standards to those of other SR instruments that emanate from entities outside of ISO. There are about 5300 business participants in the UN Global Compact (UN Global Compact), 2300 facilities have been reported to be certified to the SA 8000 standard [SAI], and around 1400 corporate responsibility reports issued in 2009 are reported to have followed the GRI reporting guidelines [Sullivan 2011]. It is possible that it is not a coincidence that AA 1000, OHSAS 18001, SA 8000 and IASE 3000-standards on specific topics related to SR that have emanated from outside ISO– have all adopted "1000" type nomenclature for their standards: the expression "imitation is the most sincere form of flattery" would appear to apply in this respect (and the actions of non-ISO entities to so name their standards can be considered an example of isomorphic institutional behaviour) [DiMaggio, Powell 1983].

Because of the high profile of ISO and its ISO 9000 and ISO 14000 series within the business community, the decision by ISO to develop an SR standard represents a significant opportunity to "mainstream" (or diffuse) the concept of social responsibility (and hence to institutionalize it) to a wide section of businesses and other organizations that have not heretofore been reached through the specialized SR rule instruments of other entities. The fact that experts from Account Ability (developers of AA 1000), Global Reporting Initiative (GRI), the UN Global Compact (UNGC), Social Accountability International (SA 8000), the Organisation for Economic Cooperation and Development (OECD, responsible for the OECD Multinational Enterprise Guidelines), the International Labour Organization (ILO, responsible for the ILO Tripartite Declaration) and other international SR rule proponents participated in the ISO 26000 working group can be seen as recognition by these other SR rule developers of the bridging (and hence "mainstreaming") potential of ISO 26000.

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The Level of Maturity and the Use of Management Methods in Business Excellence Models

Abstract: The purpose of the article is to present differences in usage of management methods in organizations. The research shows that it is possible to determine a group of methods which are perceived as most effective by the managers and the second group which used by organisations with experience with maturity and excellence models. There is a group of methods which are declared by organisations which used maturity and excellence models and are not listed in the previously mentioned group, and the third group of methods common for both populations of researched organisations. The study described in the article is a first stage of larger research project, the purpose of which is identification of effective management methods used by organizations on their path to business excellence. These differences depend on maturity of the organisation and on the fact of using excellence models.

Key words: business excellence, EFQM, models excellence, organizational methods, level of maturity

Introduction

One of the ways to improve an organization is the use of models of excellence such as the EFQM or the Malcolm Baldrige model, together with their entire methodology. For this reason, false allegations are made sometimes that business excellence models are rigid and impose predetermined methods and procedures, using clichés to be implemented in an organization regardless of its size and the level of management. Meanwhile, every now and then one can find an interesting case study describing the methods and tools used by the Malcolm Baldrige Award winners. In the case presented here, the main difference is the quantity and quality of the methods indicated by the two of its winners. For example, Lockheed Martin (the 2012 Malcolm Baldrige Award) and Mesa (the winners of the Malcolm Baldrige Award 2012) used only five common methods on their road to excellence. These methods are: Benchmarking, Balanced Scorecard, Lean, mission and vision, Quality Management System and SWOT analysis (Table 1).

Table 1. Methods used by the laureates of the M. Baldrige award in the USA

	Winners of the Malcolm Baldrig Award		
lp	**Management methods**	**Lockheed Martin**	**Mesa**
1	Balanced Scorecard	V	V
2	Quality Management System	V	V
3	SWOT	V	V
4	Benchmarking	V	V
5	Mission and Vision	V	V
6	Lean	V	V
7	Knowledge Management	V	
8	Six Sigma	V	-
9	Employee Engagement Survey	V	-

10	Badanie satysfakcji klientów	V	-
11	CRM	V	-
12	Knowledge Management	V	
13	QFD	V	-
14	Suggestion Scheme	-	V
15	Environmental Management System	-	V
16	Improvement Teams	-	V
17	PDCA	-	V

Source: own study based on National Institute of Standards Technology [2013a].

This diversification in the companies' approach to the use of such methods has become the basis for the following questions:

- does the difference in the application of management methods depend on the level of maturity of business excellence models?
- is there a difference in the use of management methods between the organizations which use and do not use models of excellence?

The literature research is merely the beginning of a larger study aimed at identifying effective methods on the way to business excellence of an organization.

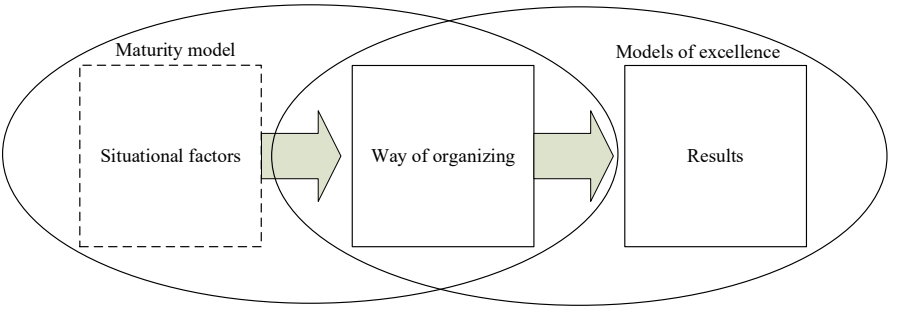
Maturity models and excellence models. The relationship

The excellence and maturity of an organization in practical terms are often treated as separate entities that mutually exclude each other, while the analysis of these models indicates their interdependence. Without understanding the context, it is difficult to improve an organization and create conditions for a further effective enterprise development. Of course, when using the chosen model, one must be aware that it is only a half-way measure on the road to improving the company. The practice of using the models of maturity shows that a model may work well to determine the level of organization of the enterprise and its usefulness ends there. This results from the structure of the model itself and from the assumption that there are some predictable patterns of evolution and directions of change in the organization. These patterns were reflected in the model's construction along a logical path, starting from the initial state, to the state denoting full maturity in a given model. In turn, the models of excellence are based on the results of

the organization, which are the key to further measuring, learning and building innovative solutions using the available benchmarks. They also have a very simple mechanism to measure the achievement of the degree of perfection. However, from the organization's point of view, this is only the basis for obtaining certificates or determining the way to obtaining a prize. Determining the level of maturity of the organization and its system would facilitate the work on the ways of improving the enterprise.

It can therefore be assumed that "maturity" means organizational opportunities that must grow over time to ensure a repeatable management success, and "excellence" determines the achievement and maintenance of the highest level of results which meets the expectations of all stakeholders of the organization. This approach entails the conclusion that maturity relates to the way of organizing, and excellence focuses on the results of the organization (fig. 2).

Figure 2. Diagram of interdependence of the maturity and excellence model



Source: [Martusewicz, Szumowski 2018].

The basis of the maturity models is the increase of organizational skills to implement the strategy and achieve the organization's goals. The goal of models of excellence is to achieve the assumed results by increasing organizational skills.

An analysis of the level of organization's maturity is an incentive to improve and build new organizational capabilities of the company. A more efficient way to organize business is necessary to achieve the expected results. The lack of implementation of the planned objectives for the indicators and organizational measures provides the basis for the improvement and for the way the organization operates. The basic assumption is that the higher the level of maturity, the greater the organizational possibilities to achieve the set goals, but also greater the stability, normativity and universality in the approach to situational factors. Setting ambitious goals before an organization is the key to improving its organizational capabilities and the resulting potential to achieve the planned results.

A model of excellence defines the key results necessary to achieve the mission, vision and strategy. This approach gives an opportunity to evaluate the achieved results and to improve the business in future and to the benefit all the interested parties.

Combining these models in the organizational practice, by examining the level of organization maturity using a maturity model and then improving it with the model of excellence, should reduce time and costs on the road to excellence.

Methods and techniques used in improving an organization

Models of Excellence help modern organizations measure, predict, monitor the needs and requirements of stakeholders and follow the achievements of other organizations. The results achieved are the basis for the implementation of improvement activities in the organization [EFQM 2013].

The use of business excellence models facilitates organizational improvement by obtaining an overview of the entire organization, as well as the identification of the organization's strengths and the areas for improvement, enables to check the effectiveness of actions undertaken and to compare it with other organizations, helps with identifying and sharing best practices within the organization, increases engagement of its employees in the continuous improvement or the improvement of internal communication and integration of various pro-quality and improvement initiatives. Such understanding of the models shows them not as an independent practice / concept / method that can be simply applied, but an initiative that allows organizations to convert resources, processes and efforts into specific business results. It is therefore important to know and understand what methods and techniques should be used to improve the organization. We managed to find and extract the results of the research carried out among organizations implementing EFQM or the Malcolm Baldrige excellence models, and in the organizations that do not use these models.

Management methods used by organizations that do not implement models of excellence

The literature analysis showed that there is no consensus regarding the number and types of tools used to improve an organization's activities. According to Adenbanjo et al. [2008] and Harrington et al. [2000], approximately 900 organizational methods and techniques can be identified. The analysis of the research conducted globally shows that the authors adopted three key criteria, i.e.: the validity, popularity and effectiveness of the

methods used for the organization. Based on this, Mann [2008] identified as important 65 tools for comprehensive quality management, including customer survey, quality cost, Benchmarking, the QFD method and employee suggestion system. On the other hand, Mahammad et al. [2011] indicated 35 methods important for the process of organizational improvement. These include: Balanced Scorecard, Business Process Improvement, Corporate Social Responsibility (CSR), Customer Relationship Management (CRM), knowledge management, lean management, building and communication of mission and vision and Six Sigma. The results of global research conducted in 2013 by Bain & Company [Rigby, Bilodeau 2013] revealed 25 of the most popular and effective tools to improve the organization's activities (Table 2).

Table 2. The most popular and effective tools to improve the organization's activities in the world

The most popular and effective tools to improve organization		
• Big Data Analytics	• Satisfaction and Loyalty Management	• Social Media Programs
• CRM	• Benchmarking	• Scenario and Contingency Planning
• TQM	• Supply Chain Management	• Mergers and Acquisitions
• Open Innovation	• Change Management Programs	• Employee Engagement Surveys
• Strategic Planning	• Decision Rights Tools	• Zero-based Budgeting
• Balanced Scorecard	• Business Process Reenginiering	• Outsourcing
• Mission and Vision Statements	• Strategic Alliances	• Price Optimization Models
• Customer Segmentation	• Complexity Reduction	• Downsizing
• Core Competencies		

Source: [Rigby, Bilodeau 2013].

Management methods used by organizations implementing models of excellence

Research carried out in Europe by Adebanjo et al [2010] on the analysis of the tools and methods used by organizations in business excellence models also enabled to identify effective and popular methods. The most popular tools include managers building and communicating missions and visions, customer satisfaction surveys, SWOT analysis, ben-

chmarking, quality management system, improvement teams and employee suggestion schemes, while techniques such as quality costs, improvement teams, customer satisfaction surveys, business process improvement and the PDCA method were perceived as the most effective by the practitioners themselves.

The latest research has been carried out in Japan, India, China, Thailand and Singapore by M. Tickle et al. [2016]. These were the largest surveys among organizations using models of excellence in Asia. Entrepreneurs identified 23 out of 60 methods proposed for the study. These methods have been indicated by mature organizations in terms of organizational excellence (Table 3).

Table 3. Methods indicated by mature organizations / laureates of Business Excellence

Methods indicated by mature organizations using Models of Excellence		
• CSR	• PDCA	• Business Excellence Self Assessment
• Environmental Management System	• TPM	• Quality Costs
• SWOT	• LEAN	• TQM
• Customer Satisfaction Survey	• SIX SIGMA	• Strategic Planning
• QFD	• Quality Circle	• Balanced Scorecard
• Suggestion Scheme	• Knowledge Management	• Mission and Vision
• Improvement Teams		• Benchmarking
• 5S	• Employee Engagement Survey	• Business Process Reengineering

Sources: based on [Tickle et al. 2016].

A simple combination of results in both groups was a surprise. It turned out that fundamentally different methods are used in the management of the companies implementing and those not implementing business excellence models. The methods in common include only: CRM, Balanced Scorecard, benchmarking, customer satisfaction surveys, BPR, TQM, mission and vision (Table 4).

Table 4. Methods used by organizations

The most popular methods used by organizations		
in the world	**common to both studies**	**Winner of Bussines Excellence**
Big Data Analytics	Mission and Vision	CSR
CRM	Strategic Planning	EMS
Open Innovation	Balanced Scorecard	SWOT
Customer Segmentation	TQM	Customer Satisfaction Survey
Core Competencies	Benchmarking	QFD
Satisfaction and Loyalty Management	Business Process Reenginiering	Suggestion Scheme
Supply Chain Management		Improvement Teams
Change Management Programs		5S
Decision Rights Tools		PDCA
Strategic Alliances		TPM
Complexity Reduction		LEAN
Social Media Programs		SIX SIGMA
Scenario and Contingency Planning		Quality Circle
Mergers and Acquisitions		Knowledge Management
Zero-based Budgeting		Business Excellence Self Assessment
Outsourcing		Quality Costs
Price Optimization Models		
Downsizing		

Source: own study.

Effective methods in management

According to a study by Rigby and Bilodeau [2013], based on the interviews conducted with the management of 1207 companies in the world, as well as the surveys by Tickle et al. [2016], the number one method for managers is the management of cu-

stomer relations. Companies strive to improve customer loyalty, maximize cross-selling opportunities and customer profitability. Currently, most companies know that it is more profitable to retain existing customers than to acquire new ones. Data and insight that come from CRM systems can be used to identify sales and additional sales opportunities. Benchmarking goes hand in hand with a balanced scorecard. Key Performance Indicators can only generate relevant information when compared to goals and benchmarks. Comparative tests may come from the company, by comparing departments and business units, alternatively they may come from the industry studies or research on best practices. Once again, this is a reflection of the current economic difficulties that many companies face. Companies have to ensure that they stay ahead of the competition. Introducing certain competitiveness into their systems, with the established performance goals and the goals set for everyone, can help increase their productivity. Another important method, according to Rigby and Bilodeau [2013] is the introduction of employee engagement into the organization – employees are the most valuable and most often the most expensive resource. Every company wants to keep the acquired or developed talents. The employees who feel involved are not only more loyal, but also more productive, which is crucial in today's e global economic competition. Data from employee engagement surveys also apply to people with Balanced Scorecard. No wonder that strategic planning is usually high on the list. It has always been important, but in a difficult economic climate it is crucial to ensure that all the efforts are focused on the most important things. While strategic planning is improving in most companies, the strategy implementation is not. The available research suggests that only 10% of strategies, including those well-formulated, are well prepared. The communication strategy is often poor – as reflected in most of the mission and vision declarations. The balanced scorecard is most popular in Europe, the Middle East and Africa. It can take the results of strategic planning and turn them into something that companies can do. A balanced scorecard helps companies implement their strategies by creating a simple one-page strategy map that defines key strategic goals. It also monitors the implementation of the strategy by means of the significant and relevant key performance indicators. It can be argued that the Balanced Scorecard is a continuation of strategic planning used to ensure that the strategy is transformed into practice. It is not clear what led to the difference between the studied organizations which appeared in the methods and techniques indicated, and in their management.. It can be presumed that two research approaches were applied. One approach indicated the methods from among which should be chosen those considered popular and effective in organizations, and this approach applies to the research in the organizations implementing models of excellence. In the second approach, the managers themselves had to indicate methods, which meant that they could indicate the latest ones they were just working on, or those which simply made it possible to

achieve a higher efficiency. This is evidenced by the indication of Big Data Analytics. This method is not yet widely applied in Europe, but it is very popular in Asia, in particular in China and India.

The level of organization's maturity on the way to perfection and the methods used

The state of full development or the state of readiness for something is the definition of maturity. Hence, maturity of an organization can be described as a certain level of organizational skills which proves the degree of an organization's preparation for fulfilling tasks and achieving objectives in a comprehensive manner [Skrzypek 2012].

Relating the maturity approach to the management system, it can be concluded with Haffer [2011] that the determinant of the maturity of the management system is the correct matching of its elements to the business model. In this approach, the maturity is not determined by the implementation in the enterprise of a specific approach to management or the achievement of the highest identified level of solutions in a given field, but the level of advancement of these solutions. In the literature there are many examples of the levels of maturity of the models of excellence. The EFQM model offers three levels, i.e. Start up, on the way and advanced. Saunders and Mann [2007] built four levels of maturity for the Malcom Baldrige model of excellence, i.e.: starting, progressing, advanced, excellent. Based on research conducted by Mohammad et al. [2011], it can be stated that the priorities for an organization at the starting stage seem to be related to finding solutions to the current problems, with the emphasis on short-term solutions, where the management style is described as "reacting". The tools and techniques recommended for this stage are Balanced Scorecard, Lean, Quality Management System, Benchmarking, Mission and Vision, and statements from improvement teams. The progressing organizational focus on preventing non-compliance through activities such as the improved product and process design and advanced quality planning. Organizations at this stage are encouraged to use more advanced techniques such as Six Sigma, knowledge management, BPR and environmental management systems. Organizations at the advanced level, treat excellence as the priority throughout the company, and can focus more on the CSR systems. At the next level, organizations are considered to be "patterns" in which all the elements of the system have been fully integrated into the continuous improvement of the organization.

The above relationship between the level of maturity of the model of excellence in the organization and the methods that are used to solve problems in the organization, was also confirmed by the studies conducted by Jackson [2002] and Tickle at al. [2016].

The research showed a significant difference in the quantity and quality of the methods and techniques used. Mature organizations use: Performance Benchmarking, best practices, Knowledge management, Lean, Mission and vision statement, quality cost, SWOT analysis, Total Productive Maintenance and BE self-assessment, CSR system, customer opinion surveys, employee research, and environmental management system. The authors believe that the application and use of these methods will enable organizations the transition from the low to high levels of maturity in achieving organizational excellence. These methods help organizations in understanding their management systems, improving their efficiency and effectiveness, implementing a chosen strategy and facilitate learning from other organizations to ensure the appropriate management of the knowledge they have gained. The organizations which aspire to achieving higher maturity on the road to excellence should consider implementing all the tools indicated in Table 2.

Conclusions

The results of comparison and analysis of research on the use of management methods are a big surprise. On the one hand, a positive element of this analysis is the fact that there exist methods used by all the good organizations in the world and they include Benchmarking, CRM, Balanced Scorecard, Employee Engagement Surveys and Strategic Planning. However, on the other hand, there is a striking difference in the use and the implementation of these methods and techniques on the part of these two groups.

It is also interesting to note that with the achievement of a higher level of business development excellence, the key necessity becomes the use of the increasingly advanced methods and techniques. It is surprising that we are not talking here about small organizations that are becoming large, but about large organizations and corporations reaching high level of maturity as a result of their improvement.

It is probably worth considering and examining whether the mature organizations using the models of excellence do not also use other management methods or whether they exist alongside the presented methods as the so-far undeveloped area on the road to business excellence.

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Does the Company Size Influence the Operational Risk in Strategy Implementation Process?

Abstract: The article describes the issue of strategy implementation considering the operational (intra-organizational) risk factors accompanying that process. The relation between the risk level and the size of the organization was analyzed. The research sample included 150 entities, which were divided according to their size. The study was conducted using a direct questionnaire interview. For independent samples, the Kruskal-Wallis analysis of variance was used. The research results did not confirm the existence of the correlation assumed. Some regularities, however, may be indicated for companies of various sizes. They refer to the area of processes as well as some factors within the area of employees and resources. The level of strategic objectives achievement was also analyzed as one of the key determinants of strategy execution effectiveness. The results showed that there is a correlation between the degree of strategic objectives achievement and the size of the enterprise.
Key words: strategy implementation, operational (intra-organizational) risk, company size

Introduction

One of the definitions of strategy execution shows that this is an iterative process of implementing concepts, policies, programs and action plans, serving exploitation of development opportunities observed with the use of resources possessed [Harrington 2006]. The effectiveness of this process is measured by the degree to which assumed initiatives and plans are realized [Nutt 1989], which means that there is a necessity to seek out the ways of removing risk factors that may influence negatively the results achieved. Thus, a significant aspect is the organization size which influences the resources accessibility, processes designed or the level of formalization. These elements form a perspective of

analysis specific for each organization. Therefore, it seems interesting to search for relationships between the enterprise size and effectiveness of the strategy execution process as well as internal factors which have a negative influence. For that reason, the aim of the paper is to verify the existence of a relationship between operational risk level (defined from the internal perspective) and organization size.

Theoretical background

One of the main characteristics, considered in the research where the companies of various sizes are compared, was its flexibility. Weinrauch et al. [1991] mention that flexibility is rather a characteristic trait of small companies and could be identified in designing the processes and effectiveness of the actions taken. Moreover, the research into strategy differences between small and large companies has shown that small organizations have resources that enable them to better and quicker overcome barriers of their development [Dean et al. 1998]. However, on the other hand, Sharma et al. [2011] mention that smaller businesses are more likely exposed to the risk of their flexibility being restricted. Therefore, there is no research that could confirm that the size of the company affects its flexibility and the results of strategy implementation, as it depends on many factors, including the specific industry and organizational features.

Those factors could include also the level of formalization, which is rather characteristic for large companies [Heidel et. al 2002]. However, as demonstrated by O'Regan et. al. [2012], in small companies, strategy creating and implementing often occurs without formal planning and written form, but nevertheless it is done successfully. Among the factors that influence different managerial practices between large and small companies we can mention the organizational visibility [Takahashi, Nakamura 2010], availability of (slack) resources [Brammer, Pavelin 2006] and scale of operations [Zhu et al. 2008].

According to Cingöz and Akdoğan [2013], there are few areas that need more attention while developing the flexible strategy. We can mention leadership, key competences, human resources, organizational structure and information, which are also the basis of the EFQM concept [*Fundamental Concepts of Excellence* 2013]. However, the list of the barriers and risk factors influencing the strategy implementation differs among authors [Mišanková, Kočišová 2014]. In many studies, we may find the conclusion that the capital and operational budgets are the most important when it comes to strategy execution [Anand, Merrifield 1982]. That is mainly because the allocation of financial resources affects the allocation of other resources, and as a result influences various aspect of the action plan [Olsen et al. 1992]. As the large companies possess more capital, they are perceived as more likely to achieve better results in implementing their strategy. That is

mainly because of possessing easier access to a crucial resource – knowledge [Hörisch, Johnson, Schaltegger 2015]. Moreover, in case of slack resources at the disposal, large companies are more likely to accept the initial costs and commit the employees to support the implementation process [Galani et al. 2012].

However, Cloudhury, and Sampler [1997] concluded that firm size influences the higher level of heterogeneity in functional areas of the company and the dispersion of specific knowledge. Moreover, large companies are perceived as an environment of greater uncertainty [Schmelzer, Olsen 1994] and more likely to being inertial due to greater difficulty in communicating [Keats, Hitt 1988]. For that reason, different managerial practices are required. As indicated by Weiner and Mahoney [1981], differences in performance are associated with differences in firm size. That research was further developed by Harrington [2006], who confirmed that firm size had a positive impact on profits and overall firm success and a negative impact on the level of success in implementing strategies.

Research methodology

The research sample contained 150 entities quoted on the Warsaw Stock Exchange and on the alternative New Connect market, different in the size and branch in which they run their activity. The presence on the stock exchange requires determining and precisely specifying a strategy and strategic goals and reporting the progress. The research aimed at recognising the strategy implementation (its effectiveness measured by the degree of achieving strategic goals) and to explore the level of operational risk included in this process. Based on the EFQM concept, 6 areas of operational (intra-organizational) risk were determined – leadership, strategy, employees, resources, processes, and measures. The risk level was calculated as the probability of a given factor and the assessment of its impact (coded to scale 1–5). The study was conducted using a direct questionnaire interview – the survey was carried out with the use of PAPI. Risk in management is an issue that could be identified using different techniques (i.e. brainstorming, questionnaires, Business studies which look at each business process and describe both the internal processes and external factors which can influence those processes) [*Federation of European Risk Management Association 2002*] and therefore the 5-point Likert scale was used. The data collection enabled to study the perception of respondents, not the actual features of strategy, which could be considered as a limitation of the study. Those latent variables represent qualities that are not directly measured [Tabachnick, Fidell 2001] and the constructs operating in the mental world of individuals [Borsboom et al. 2003].

As mentioned before, the research sample included 150 entities, which were divided according to their size (50 small, 50 medium and 50 large companies). Although there are

various definitions considering the criteria used, in this research the number of employees was chosen [Gilmore et al. 2013]. It was assumed that a small company employs up to 49 people, medium one - 50-249 employees, and a large company employs more than 250 people. The research sample consisted of 38.6% of small (58 entities), 32.1% medium (48 firms) and 29.2% large organizations (44 companies).

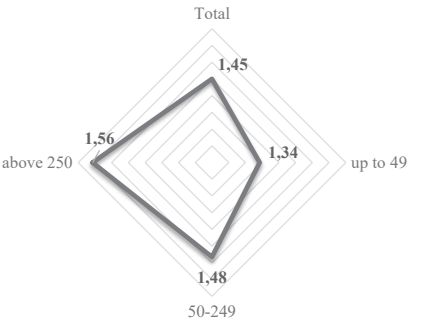
Results and discussion

The subject of the research was a relationship between the operational risk level and the size of a company and thus the following research hypothesis was formulated:

H: There is a relationship between operational risk level accompanying strategy execution and organization size.

The first stage of the research was the analysis of operational risk level that may be indicated for organizations of different sizes. Its comparison was demonstrated in figure 1.

Figure 1. Operational risk level for organizations of different sizes



Source: research results.

The analysis of results obtained allows to claim that operational risk level does not vary substantially in particular groups of companies. There is an insignificant difference between small (the lowest level) and large enterprises (the highest level) and the value obtained for medium companies is almost equal as for the sample in general. Although, as it was previously mentioned, the differences are not significant, small companies show the lowest level of operational risk which seems to be an interesting result contra-

sting with the research results present in the literature. Further analyses confirm a similar regularity.

The aim of the first analysis was to verify the differences in the strategic objectives achievement which is one of the measures of strategy execution effectiveness. The non -parametric Kruskal-Wallis test for independent groups carried out proved the existence of statistically significant differences that are presented in table 1.

Table 1. Comparison of the degree of strategic objectives achievement in companies of various sizes

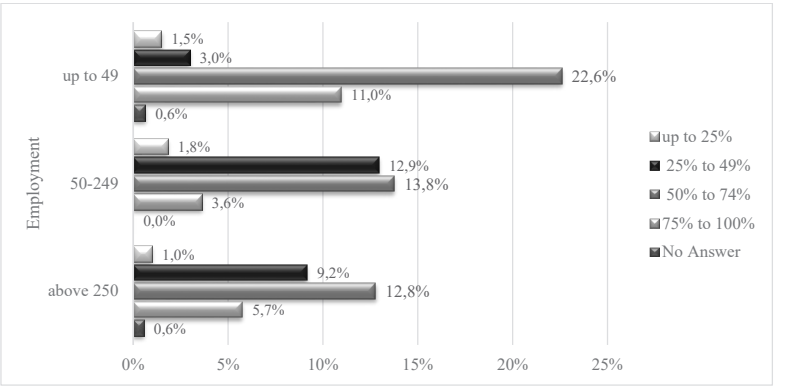
Variables	Significance
Degree of strategic objectives achievement and organization size	0,009

Asymptotic significances were presented. Significance level is 0.05.

Source: research results.

The significance level obtained, allows to claim that the degree of strategic objectives achievement and the company size are related. Owing to the fact that both variables were not of a nominal nature, we may not explore the direction of this interdependency. However, the existence of significant differences could be perceived as an interesting issue. In order to obtain more detailed information, results for companies of various sizes were shown in figure 2.

Figure 2. Degree of strategic objectives achievement in organizations of different sizes



Source: research results.

Analysis of results obtained shows that in the research sample small companies are characterized by the highest percentage of strategic objectives accomplished. The level of over 50% was achieved in the case of 33.6% of them while medium and large organizations constitute 18.5% and 17.4% of the sample respectively. It is also worth indicating that the highest percentage of objectives achievement (over 75%) for small organizations is almost twice higher than for large and almost three times higher than for medium entities. Considering a lower level of operational risk as presented above, it may be concluded that small organizations show the highest operational effectiveness in executing strategies devised, successfully eliminating potential or actual threats which may occur during the process fulfillment.

The second stage of conducted research concentrated on the verification of the research hypothesis formulated. For that purpose, the existence of interdependency assumed was examined by means of the non-parametric Kruskal-Wallis test for independent groups. The result was presented in the table below.

Table 2. Comparison of the operational risk level in companies of various sizes

Variables	Significance
Risk level (average) and organization size	0,052

Asymptotic significances were presented. Significance level is 0.05.

Source: research results.

Due to the significance level higher than 0.05, no interdependency assumed may be confirmed. There is a statistically significant lack of differences between variables. Thus, it may not be concluded that that there is a correlation between the level of operational risk and organization size and thereby research hypothesis assumed may not be verified positively. Further research, however, was undertaken in order to analyze the areas and risk factors. As a result, some regularities were identified.

Analysis of operational risk areas (6) and factors identified within each of them (30) proved the existence of statistically significant differences only in a few cases that are presented in table 3. Remaining values were higher than the significance level accepted which confirms the lack of statistically significant differences. For the clarity of results presented, only the factors with the significance level lower than 0.05 were shown.

The results obtained in the study indicate six factors where a statistically significant difference between variables can be observed. It is worth mentioning that four of them belong to the area of processes. Also, the level of significance calculated for this area is the lowest, which means that it is possible to indicate differences in the risk level in orga-

nizations of various sizes. It may be assumed that it is connected with the influence and interrelations with the other areas. An appropriate design of the processes is important both from the perspective of possessing the resources and devising a measurement system of results achieved. The area of processes may thus be recognized as having a basic function and consequently defining mutual relations between areas specified. Owing to this, minimizing operational risk related, may positively influence other operational risks factors.

Table 3. Comparison of operational risk level for particular factors and areas in organizations of different sizes

No.	Area	Factors and areas of operational risk	Significance
F15	**Employees**	Employees do not possess the knowledge or competences enabling the effective strategy execution	0,003
F20	**Resources**	There are difficulties in increasing the potential of resources possessed according to strategic intentions	0,01
F21	**Processes**	The process of strategy communication is ineffective	0,045
F22	**Processes**	Motivation process does not include strategy execution effects	0,014
F24	**Processes**	The processes of monitoring the degree of strategy execution and identifying occurring deviations is inefficient	0
F25	**Processes**	The process of reacting on observed deviations (making necessary adjustments and modifications) is inefficient	0
A1	Leadership		0,045
A3	Employees		0,023
A5	Processes		0
A6	Measures		0,013

Asymptotic significances were presented. Significance level is 0.05.

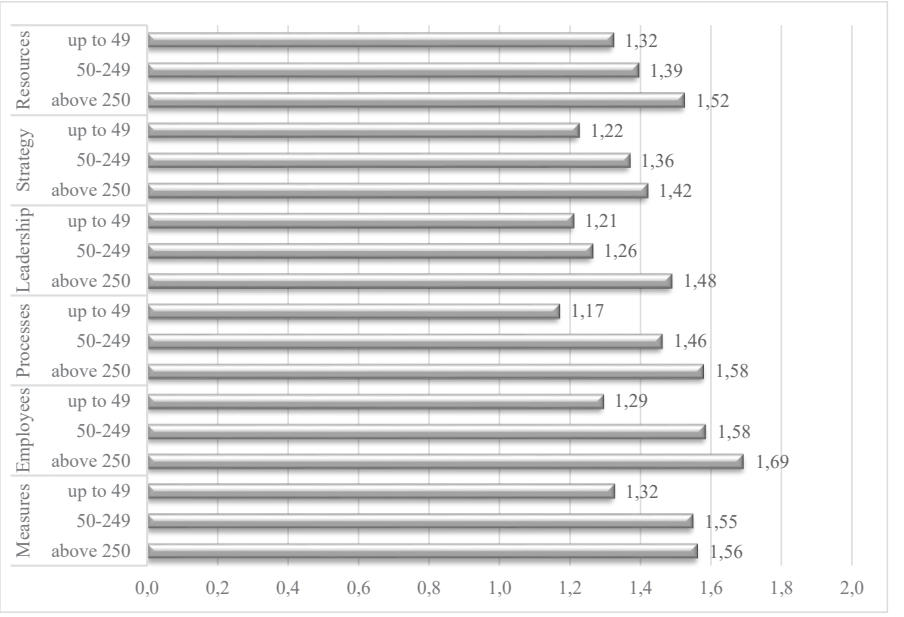
Source: research results.

Therefore, the last stage of the conducted research was the analysis of operational risk level specified within six areas in organizations of different sizes. The results were presented in figure 3.

Results obtained are quite alike, presenting a similar level of operational risk in particular areas. No significant differences may be indicated. However, it is worth to analyze the area of processes, where the spread of results is the highest. The lowest risk level may be identified for the small companies (1.17) and the highest for large enterprises (1.58). It should also be mentioned that the value of 1.17 is the lowest of all results obtained.

It may be concluded that although, as it was mentioned before, the differences are not significant, they present some regularities confirming the results of previous analyses.

Figure 3. Operational risk level in particular areas in organizations of different size



Source: research results.

Conclusions

Statistic tests conducted did not confirm the existence of assumed interdependency between operational risk level and organization size. However, some regularities may be indicated for small companies. They concern the area of processes which indicate the lowest risk level. On the other hand, the highest differentiation (from the perspective of the size) was indicated for four out of six factors within this area which proves that it may be considered as significantly different within the perspective. Therefore, a following conclusion regarding differences assumed may be accepted: *There is a relationship between operational risk level accompanying strategy execution in the area of processes and organization size.*

The level of strategic objectives achievement was also analyzed as one of the indicators of strategy implementation effectiveness. The interdependency between the

degree of objectives achievement and the company size can be indicated. For small companies the level of strategic objectives achievement is the highest which, combined with the lowest operational risk level accompanying strategy execution, enables to conclude that in the research sample small organizations present the highest effectiveness of strategy execution process. The subject of further, in-depth research (rather of a qualitative nature) should verify the managerial practices that could be characteristic for organizations of different sizes. Moreover, it would be worth investigating whether they vary enough to indicate the sources of higher effectiveness in strategy execution presented by small organizations.

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Graphene Flakes – Prospects for Commercialization

Abstract: The development of an innovative economy is undoubtedly associated with technological breakthroughs. One of the most important in recent years was the isolation of graphene in 2004 [Geim, Novoselov 2014], which was the basis for the 2010 Nobel Prize in physics. Graphene is a two-dimensional material whose structure resembles a honeycomb, thanks to which this carbon material has completely unique characteristics. There are two basic types of graphene that differ in the methods of obtaining it, features and potential applications: epitaxial (intended mainly for electronics) and flakes (for a very wide range of applications). The aim of the article is to indicate the basic economic reasons for the commercialization of graphene flakes.
Key words: graphene, commercialization, industry analysis, Quicklook methodology

Introduction

The development of innovative economy is largely related to technological breakthroughs. With the exception of countries whose economy is based largely on the extraction and sale of natural resources (Arab states, Russia), highly developed global economies have achieved their successes thanks to the ability to implement the results of research and development carried out by scientists in laboratories. However, two components of the economic successes of such countries should be clearly distinguished: technological progress, which is achieved thanks to the work of scientists and economic capabilities in the implementation of research results for real commercial applications. The latter aspect is at least as important as scientific progress, because it essentially determines the economic potential of a given country.

In the last decades, there have been many spectacular successes of scientists around the world, which were commercially used in practice. The sectors that use breakthrough technological solutions include, for example, nuclear energy, consumer electronics, cellular telephony or pharmaceuticals. The bases of the development of these industries were scientific discoveries that were effectively commercialized.

The speed of implementation of individual technologies into the form of commercial solutions is diverse. There is a certain period of time from the technological breakthrough to its commercial use. This difference varies for individual technologies and industries, where there are cases of successful implementations after only a few years from obtaining the invention, there are also technologies for which the implementation period reaches even several dozen years. It is difficult to unambiguously determine the reasons for such differentiation, but there are scientific models of spreading (diffusion of) innovations [Rogers 2003], which consists of five decision phases (knowledge, persuasion, decision, implementation and confirmation).

Among the many technological breakthroughs of recent years, the isolation of graphene in 2004 deserves special attention [Geim, Novoselov 2007], which resulted in the award of the Nobel Prize in physics in 2010 for Geim and Novoselov. From the very beginning, graphene, due to its unusual features, has aroused great interest. This was not only the case for the scientists dealing with physics (or chemistry), given the broad spectrum of potential opportunities to implement graphene technologies in various industries, the interest in this new two-dimensional material was common.

The first attempts to commercially use graphene are making nowadays, however, as of today, this material is mainly sold for research and scientific purposes. In other words, today's key buyers are various types of research laboratories. This state is gradually changing, in the next decade it is assumed that one of graphene forms, graphene flakes, is going to be widely used in many industries.

Bearing this in mind, the main objective of the study is to identify the possibilities and key barriers to the commercialization of graphene flakes. The focus will be on a few selected sectors of the Polish economy, while the starting point of the article is a clear distinction between two main types of graphene: epitaxial and flakes. Differences between these two types of graphene do not rely solely on the different methods of obtaining them, but also on the significant diversification of the possibilities of their implementation in specific sectors of the national economy.

Graphene – the material of future

Graphene is an allotropic form of carbon, which is called the father of all graphite forms: nanotubes, fullerenes, or graphite. It is a two-dimensional (2D) material, whose structure resembles a honeycomb, while its ideal form consists of a flat, single layer of carbon atoms arranged in a hexagonal network (six-membered rings with corners in the form of carbon atoms). The features of graphene are quite unusual [Lipińska, Woluntarski 2017]: it is a very good heat conductor, it is almost transparent and extremely tensile (about 200 times more than steel). The electrical conductivity of graphene is better than silicon (which gives the basis for its use in electronics), it also has very interesting filtration characteristics (at the same time impermeable to gases and permeable to water).

The above features of graphene evoke unusual interest in this material of the future. This is visible not only in scientific reports, it also the matter of media interest. In spite of this, however, there are no more detailed data indicating the possibilities of commercial implementation of graphene technologies in particular sectors. What is more, the analysis of the differences between two key forms of graphene, related to the different method of obtaining it, is not a clear public knowledge.

Generally, there can be distinguished five basic methods for obtaining graphene [Lipińska 2013]:

- graphite micromechanical exfoliation, available in principle for every laboratory, which does not find commercial applications due to the costs of the process,
- chemical phase deposition (CVD), where the graphene layer epitaxially grows on the substrate. The source of the substrate can be single-crystalline or polycrystalline, most often metals (such as nickel, iron, iridium, copper, ruthenium), also substrates in the form of a tile or foil. This form of graphene is known as epitaxial graphene, the main predicted application is the electronics industry,
- thermal decomposition of silicon carbide, which despite the fact that it is the purest method (without introducing additional substances), is very limited in practice due to the uneven accumulation of graphene and the lack of a uniform flat surface,
- "unsealing" nanotubes, treated as a kind of scientific curiosity due to the low efficiency of this process,
- chemical methods of graphene production, the final effect of which is the production of uncoated graphene "flakes", which are a very good starting material for the production of graphene composite materials.

The latter method of graphene production gives hope for the fastest commercialization of graphene technology due to the good reproducibility of the production process and a wide range of potential applications. Chemical methods of graphene production [Park and Ruoff, 2009] are a huge group of methods, with the starting point of

carbon in various forms: natural graphite, carbon fibers or pyrolytic coal (HOPG). The two most common methods for obtaining graphene flakes are: oxidation-reduction and direct exfoliation. The final result is the creation of one of several products in the form of: graphene oxide (GO), reduced graphene oxide (rGO), two-stage reduction of graphene oxide, graphene powder or graphene paper.

Effects of the use of graphene flakes

The graphene technology has induced a great interest mainly due to the unusual features of this material. A small addition of graphene added to the polymers fundamentally changes their characteristics. Examples of increasing the parameters of individual materials as a result of adding graphene to them can be found in Table 1. What is noteworthy, the very slight addition of graphene flakes, within a maximum of a few percent (with the range between 0.07% up to 4%) affects the definite improvement of the features of a given composite. This indicates one of the future applications of the graphene flakes.

In addition to being used as a filler in composites (polymeric, with elastomers, ceramics), graphene flakes can be used in many other industries [Lipińska, Winkowska, Woluntarski 2017]. The classic examples include its use for heating and anti-corrosive coatings, paints, varnishes and conductive inks, energy production and storage (batteries and supercapacitors), sensors, medical applications (regenerative medicine, anti-cancer therapies, drug carriers). The mentioned above products are already known potential applications of graphene flakes, this list can be significantly extended in the near future according to nowadays research results.

Table 1. Graphene in polimer composites

Polymer	Amount of graphene (%)	Effect – improvement compared to pure polymer
PET	0,07	40% higher tear resistance
PMMA	2,8	Electrical conductivity 15,7 S/m
Polyamide fibers	0,8	1,6 times greater tensile strength 220% higher Young's module
Polybutadiene	1	330% higher tensile strength 190% flexibility
Crosslinked epoxy rubber	0,7	8,7 times higher Young's module 87% higher tensile strength
Polyamide 6	0,2	Twice better thermal conductivity 2,4 times higher tear resistance
PCW	4	3,2 times greater tensile strength 420% higher Young's module

Source: [Lipińska, Woluntarski 2017, p. 23].

Industrial analysis

The above mentioned graphene flakes features, changing the characteristics of the materials to which it is added, indicate its huge application potential. It cannot be excluded that in the next ten or twenty years, products with the addition of graphene will be widely used. According to market forecasts [*The Global Market…* 2017] graphene flakes can be used in many industries. This may apply to products related to: sport, desalination, prostheses, tissue engineering, wearable electronics, capacious batteries, lightweight composites, fast charging and many other potential applications.

However, it should be noted that currently (data for 2017), despite the significant scale of expenditures on graphene flakes production, the supply significantly exceeds demand. The largest producers include companies from the USA (Angstron Materials, Garmor, XG Sciences), China (Beijing Carbon Century Technology, Ningbo Morsh, Wuxi Graphene Films) and Taiwan (Taiwan Carbon Nanotube, Aztrong). A noticeable share in the global graphene market have also several European companies: from Great Britain (2-D Tech, Applied Graphene Materials, Cambridge Nanosystems) and Spain (Graphenea). The position of Polish producers (Nano Carbon and AGP) was also noticed on the market, although their production scale is small. It should be noted, however, that there is a significant differentiation between the quality and types of graphene offered by individual companies. Both types of graphene are summed (epitaxial and flaky), moreover, the characteristics of individual products are very different (in general, products from the Far East are cheaper and lower quality).

Despite the significant overrun of the production scale compared to demand of the potential buyers at the moment, a significant increase in the graphene production market is expected in the future. This prognosis is related with a significant reduction in graphene prices (especially flakes prices), because as for now it is one of the most expensive production materials available on the planet. According to market data (for 2016), the most expensive type of graphene (Pristine Graphene Mono-layer Flakes with a thickness of 0.35 nm) exceeds USD 1 billion per kilogram. Prices for a lower quality products are much lower: Single Layer Graphene (up to 1.75 nm) is around 1 million USD per kilogram, rGO (0.35 nm) is over 0.5 million USD per kilogram, while GO (about 1 nm) costs about 0.3 million USD per kilogram. This price level of graphene is significantly limited by market applications today.

Most of today's buyers are from the field of science (research laboratories), it is estimated that their share in the world graphene market is at the level of 95%, the remaining part of the market comes from industries as: sensors or composites. Nevertheless, many analyzes indicate the possibility for a significant price reduction for the basic forms of graphene (especially GO) along with the increase in production scale. This should signi-

ficantly increase the interest of graphene commercial products. At the same time, according to the theory of innovation diffusion [Rogers 2003], it should be noted that the implementation will probably be carried out at different speed depending on the division of clients into: innovators, early adopters, early majority, late majority and laggards. After positive acceptance of the novelty by the first two groups, gradual spreading of graphene products should be expected until the assumed sales volumes are achieved.

According to current forecasts, the graphene production market will increase from the current (2016) scale estimated to be between 15–150 tonnes annually, for production oscillating around 1,000 tonnes of 2020 and exceeding 3,000 tonnes (with average rating) in 2025. The structure of the market will also dramatically change: graphene sold for research purposes will account for only about 1% in 2025, while the main sectors in which graphene will be used are: composites, energy storage, inks and coatings.

By making approximate analysis of the potential of market applications of graphene, one can use the available analytical methods for estimating the potential of commercial implementation of innovations. One of the most interesting methods is Quicklook [Gwarda-Gruszczyńska 2010], which was created as a result of many years of work of the IC^2 Institute's team (Innovation, Creativity, Community) at the University of Texas at Austin (USA). Through its use, one can assess the commercial potential of innovation or technology, which gives the opportunity to obtain the information necessary to make a decision regarding the implementation of the product (technology). This method can be successfully used in addition to other classical analytical methods in the field of management (SWOT/TOWS type, Porter's five forces, portfolio methods), to assess the current state of technology, which is the subject of implementation.

Quicklook methodology consists of the following four steps [Zehner 2012]:

- Identification of potential markets and applications,
- Identification of end users, distributors and potential licensees,
- Contacting experts and companies,
- Writing the report/documenting the process

In the current study, the scope of the first step of the analysis will be indicated, the aim of which will be the potential for estimating markets and possible applications (Table 2). The list of possible factors assessing the scope of the graphene flakes market potential should be: market scale, entry barriers, ease of commercialization, implementation cost, market competition. The assessed industries that can successfully implement graphene flakes technology are: polymer composites, energy storage, electronics, coatings (mainly anti-corrosion) and aviation industry. The results of the below analysis should be terated with extreme cautions bearing in mind the degree of difficulty of the analyzed issue. The scope of the analysis was limited to the Polish market, however, one should bear in mind that the early implementation of graphene technologies can significantly

increase the scale of competitiveness of Polish products, thus generating an increase in the scale of operations.

Table 2. Graphene flakes – industrial potential

Analyzed factor (scale 1–5)	**Industry** (total scale: 5–25)				
	Polymer composites	**Energy storage**	**Electronics**	**Coatings**	**Aviation industry**
Market scale	4	5	2,5	3,5	2,5
Barriers of entry	3	4	4	2	4
Ease of commercialization	4	2	2	3	3
Cost of implementation	4	3	2,5	4	2
Market competition	3	4	3	4	2
TOTAL	**18**	**18**	**14**	**16,5**	**13,5**

Source: own calculation.

Based on preliminary estimates, it can be assumed that commercialization of graphene flakes would be relatively easy for two industries: composite polymers and energy storage. It would be slightly more difficult for the coatings production industry (mainly anti-corrosion products). The last two considered sectors (production of electronics and aviation industry) would have greater difficulties in commercializing this technology in Poland. It should be noted, though, that this is largely due to the current weaknesses of these sectors in the Polish economy. However, it should not be ruled out that in the near future Polish enterprises will consider the possibility of diversification [Matyjas 2016] of their business profile by deciding to invest in the industries mentioned above.

Main barriers of commercialization of graphene flakes

An attempt to brief evaluation of potential barriers related to the commercialization of graphene flakes in Poland is the last issue of the article. Some of the indicated below factors are connected with the universality of barriers (it concerns the global situation in principle), while the part concerns the specificity of Polish situation. Despite the risks indicated below, it should be clearly stated that graphene technologies are already entering the first commercial products. The decisive time for the pace of acceptance of graphene products will come in the next year or two.

The most important barriers to the commercialization of flaked graphene include:

- problem of production scaling – currently several players in the world have started to produce in a larger scale. This does not automatically mean that the transition to

a massive production scale will come at ease. This is especially a problem of epitaxial graphene, it seems easier to solve for graphene flakes,

- investment costs – this may be a problem mainly for small Polish companies interested in developing the production of graphene. Recently, Grupa Azoty informed about the investment in graphene flakes production processes in Tarnów. The Institute of Electronic Materials Technology (ITME) in Warsaw also plans to significantly expand the production scale[1],
- legal regulations – there is a certain risk that, as with many new technologies, a graphene one may be harmful [Matyjas 2015]. Hence, the implementation of regulations and standards on an international scale may be understand as a threat,
- threat from other nanotechnologies – despite the promising results of the industrial use of graphene, work on other nanomaterials continues. It cannot be ruled out that they may threaten the forecasted position of graphene flakes in the future. The implementation of mass production seems to be the most important factor determining the future position of graphene market. Mass production will introduce a standard which, due to the costs, will be difficult to replace. Until then, however, any other promising technology can be a potential threat,
- low acceptance of graphene products by end customers – this risk may result from the price of products using graphene in the first place. The first market products, due to the very high prices of various forms of graphene, can be mainly used in low price sensitive applications (such as military technologies). The first commercial graphene products may be high-quality products for professional sports (eg tennis racquets with the addition of graphene, graphene athletic shoes, graphene lubricants for bicycles), each subsequent graphene commercial product should lead in effect to reduce the price of the raw material.

Conclusions

Graphene as a two-dimensional material "conquered" world media due to the unusual characteristics of this material. A clear proof of the importance of graphene was the very quick award of the Nobel Prize in physics for the discoverers of this material. The possibilities of commercial use of graphene are related to its form and production methods. There are two key ways to produce graphene: top-down (graphene flakes) and bottom-up (epitaxial graphene). The epitaxial graphene was until recently regarded as a material of the future in electronics, nevertheless, due to the serious difficulties associated with its practical use, as well as production costs, it is still relatively distant from mass implementation.

[1] The Author of the article serves as the director of ITME.

The situation of the second main form of graphene, i.e. graphene flakes, is completely different. Due to the different form of this nanomaterial, closer implementation to mass production, as well as the wide potential of applications in many industries, its mass use in many commercial products is very close. However, the participation of Polish industry in the graphene fever unfolding before our eyes remains the open issue.

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