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# High-Tech SMEs in the concept of intelligent organizations: The reconstruction of the approach in the light of empirical research

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## Abstract:

The objective of this paper is to present the concept of intelligent organizations, which is nowadays believed to be the highest developed form of a company and to check if high-tech small and medium enterprises (SMEs) from Greater Poland region are run according to the concept of intellectual entrepreneurship. Verification whether the high-tech SMEs meet the criteria of intelligent organizations was tested on a sample 44 SMEs using a survey CATI tool. Data analysis consisted of comparing the values of three statistical measures (dominant, median, arithmetic average) of seventeen items. The survey results confirm that these enterprises base their actions on intellectual capital, which becomes the most important element of business management in the strategic perspective. Thus, their actions are consistent with the concept of intellectual entrepreneurship. The originality of this work lies in studying the concept of intellectual entrepreneurship taking into account companies from high-tech industry. Up till now companies from Greater Poland region were analysed just for their level of innovations, not intellectual capital. It is important to encourage more companies to be run according to the intellectual entrepreneurship concept due to unstable circumstances worldwide.

**Keywords:** globalization; intellectual entrepreneurship; intelligent organization; human capital; social capital

**JEL codes:** O31, O32

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## 1. INTRODUCTION

It is difficult to find an example of a wealthy country with a closed economy. Open borders and free movement of the means of production, final goods and services until recently guaranteed both economic development and technological progress around the world (Geenhuizen & Ratti, 2001). Ideal examples of this are the economies of such countries as South Korea, Singapore, Hong Kong, Taiwan, and China. And although the literature points to numerous indisputable advantages of the internationalisation of markets, institutions and outcomes, and their aggregated

form of globalization, its disadvantages must also be pointed out. It can undoubtedly be attributed with the following negative traits: the lack of global coordination, the impairment of authoritarian state in the economy, the accumulation of negative externalities, the dominance of microeconomic interest and the relaxation of rigor in terms of risk-taking by managers (Harrison, 2007). These aspects "contributed to a violation of the fundamental economic balance between the need for growth and profitability and the pursuit of security. The other side of the disturbed balance between profitability and security is economic instability" (Szymański, 2011, p. 15). Obvious examples of such instability can, in turn, be found in such countries as Greece and Cyprus, where the disregard for economic security has shaken not only their economies, but – given the high degree of dependence – also the entire European Community.

Economic reality is now characterized by the scarcity of confidence, trust and stability. Modern enterprises do business in an environment of generalized insecurity that hinders strategic planning in the long term, but promotes opportunistic behaviour (Cook & Kramer, 2004; Roubin & Mihim, 2011). As a consequence, verification, or adjustment activities have become increasingly difficult in observed high complexity of modern world, and it forces a new look at entrepreneurship and competitiveness. In literature one may find new concepts for understanding entrepreneurship in terms of new ideas, knowledge management, intellectual capital, innovation diffusion, as well as the ways of organizing the company (Ismail, Poolton & Sharifi, 2011; Teece, 2007).

The main purpose of this article is to point out the concept of an intelligent organization, which conducts its activity based on intellectual capital, and the synergy of human, social and organizational capitals. Bendkowski (2012, p. 21) states that the idea behind an intelligent organization "is to use its resources of knowledge with their simultaneous restoration and renovation. Thus, allowing for high flexibility and smooth adaptation to the environment and the anticipation of external conditions". The theoretical background of the problem has been further enhanced by the prospect of research on the high-tech SMEs sector in Greater Poland. The participation in the study (using CATI technique) was confirmed by 44 entities of which 32 were small, and 12 medium-sized companies. By using statistical measures (like dominant, median and arithmetic average) the sample companies were analysed and results have been presented.

## **2. THE CONCEPT OF AN INTELLIGENT ORGANIZATION**

More than thirty years ago Peter Drucker proclaimed that global societies had entered the era of discontinuity and uncertainty (Drucker, 2015). For this reason, as described by Szymański (2011), a critical reflection on classical and neo-classical approach to the analysis of reality made sense not just 50, 30 and 20 years ago, but also makes sense at present. It is even more apparent knowing that these schools recognize any fluctuations as normal economic phenomena, which should not cause unrest, because they are temporary. At the same time, the well-functioning market

mechanism will ultimately lead to balance. The author adds, however, that today "qualitative transformations require substantial revision of the guidelines" (Szymański, 2011, p. 37). Also Joseph Stiglitz notes that "science quite often so strongly believes in assumptions or they are so firmly entrenched in our thinking that no one realizes the fact that these are only assumptions. (...) Economists assume that information is excellent, although they understand that it is not the case. Theorists hope that the world of imperfect information works very similar to the world of perfect information" (Stiglitz, 2010, p. 297).

The range of current changes resulting from the opening of economies and their internationalisation, complex phenomena of offshoring, industrial and even economic relocation, force one to reject the classical concept of full rationality, and thus the idealized model of homo oeconomicus. According to Janasz, "progressive globalisation will increasingly affect development prospects for individuals, organizations, cities, regions, countries and even continents" (Janasz, 2012, p. 61). Moreover, some authors claim that a new kind of society is now forming, namely "homo globalis" (Strenger, 2011).

In such a dynamic environment where the extrapolation of past experiences and the anticipation of foreseeable trends are impossible, and where the culture of insecurity and mistrust is constantly growing, the unmistakability of resources is gaining importance (Jashapara, 2006). In particular such resources that allow constant adaptation to a changing reality. According to Ratajczak-Mrozek (2010, p. 45) "under hypercompetition permanent competitive advantage is replaced by a series of instantaneous states of comparative advantage. This means that companies, instead of trying as long as possible to keep their well-established competitive advantage, should constantly search for new ways to maintain their dominant positions, which means to constantly question and demolish their current advantage and the advantage of their competitors". Thus, contemporary management paradigms need to be gradually redefined and broadened with such strategic, and at the same time, intangible elements as: knowledge, skills, experience and leadership, human capital, as well as trust, loyalty and credibility – collectively referred to as social capital (Libertowska, 2014, p. 96). Moreover, the importance of creativity and innovativeness has been growing along with high flexibility and seamless adaptation to the environment (Brilman, 2012; Easterby-Smith, Lyles & Petraf, 2009; Eisenhardt, 1989; Kogut & Zandar, 1992).

The concept of intellectual entrepreneurship with intellectual capital at its foundations is an answer to these new, difficult conditions. As observed by Baron and Armstrong (2007, p. 9) "the concept of intellectual capital composed of three elements points out that while individuals (human capital) create, maintain and use the knowledge, which is multiplied by the interactions between them (social capital) and consequently it generates institutionalized knowledge which is owned by the organization (organizational capital)". According to Love, Fong and Irani (2005, p. 1), this specific type of entrepreneurship involves "establishing a basis of material wealth of intangible knowledge". Janasz (2012, p. 31) adds that natural

features of this type of enterprise are creativity and innovativeness. Intelligent organizations are thus identified as the highest stage of enterprise improvement. The table below presents the main differences between a traditional organization, and an intelligent one.

**Table 1.** The features of traditional and intelligent organizations

<b>Traditional Organization</b>	<b>Intelligent Organization</b>
Work fully utilizes only the knowledge of a small part of employees	Work is based on the knowledge of all participants
Hierarchical structure	Network structure
Functional management system	The dominance of intellectual capital management
The dominance of routine work, repeatability and procedures	The dominance of activities involving innovative solutions
Individual or group work	Teamwork
Work involves the performance of duties	Design work
The use of individual skills	Synergy in teamwork
Strong position of managers	No typical managerial positions, and if they exist, a manager acts as a coach and an inspirer
Orientation inside the company to maintain internal balance	Orientation on the outside and creating a global value
Top-down coordination	Coordination by team participants

Source: (Mikula & Ziębicki, 2000) quoted in (Bendkowski, 2012).

In the context of intellectual entrepreneurship particular significance is attributed to human capital, including knowledge as a strategic element, which allows the creation of competitive advantage (called knowledge-based view) (Kogut & Zander, 1992, p. 391). There is no doubt that knowledge is rare and it depends on context. Each enterprise produces appropriate knowledge, which means that it is difficult to forge (Bendkowski, 2012, p. 21). Thus, the willingness of companies for creative and innovative solutions to new problems and undertaking an entrepreneurial approach with a simultaneous risk appearing in connection with new, uncertain and revolutionary changes "remains associated with the intelligent use of knowledge aimed at creating new knowledge and new skills, which lead to the realization of unique projects. All this allows one to unlearn routine, traditional and customary behaviours" (Janasz, 2012, p. 30).

Moreover, it is worth noting that the literature emphasizes particular importance of tacit knowledge, which arises within organizations and becomes subject to rapid transfer between the employees of a company and between the company and its environment (Nonaka, 1995). This knowledge can become an important source of innovations, and thus can contribute to gaining competitive advantage in the future. It allows giving up the strategies of imitation. It means moving away from technological approach to knowledge popular in the 80s and 90s and taking up a social approach in which knowledge is created as a result of mutual interaction and group learning (Janasz, 2012). According to Czop (2001, p. 98), "[...] it is thanks to the many interactions occurring between the participants of organizations,

the processes of transferring information and knowledge and the learning processes, that an organization is able to survive on the market. A modern organization inspires and supports the learning of all its members, constantly transforms itself, expanding its creative possibilities for the efficient creation of the future".

Thus, the second element of intellectual capital – social capital grows in importance. "Focusing on people creates an atmosphere of harmony within a company and facilitates the use of wealth and originality of employee personality traits, filling a wider social and cultural role. This makes the people and the relationships between them the greatest good of a company" (Grzanka, 2009, p. 10). This suggests that in an intelligent organization the appropriate selection of employees in terms of skills and qualifications should go hand in hand with social skills. The concept of intellectual entrepreneurship emphasizes the role of cultural factors and the system of fundamental values in the process of decision-making.

### **3. THE CHARACTERISTICS OF THE STUDY AND THE ANALYSED SAMPLE**

Within the framework of the project undertaken in the period between May 2013 and November 2014, titled "The role of intangible assets in shaping competitive advantage of high-tech companies in Greater Poland," a survey of small and medium-sized enterprises from the high-tech sector<sup>1</sup> was conducted. All the participants were located in the Greater Poland region. The basic research problem was to identify the extent to which these entities use soft factors of production in acquiring their superior position over their competitors. The questions in the survey also made it possible to assess the extent to which these companies are aware of new trends in the management of modern enterprises and whether they are guided by the concept of intellectual entrepreneurship. The essence of the study stemmed from the fact that "companies predominantly attach importance to current efficiency and represent the traditional approach" (Janasz, 2012, p. 35), while too little number of business entities chooses a strategy based on change, innovation and flexibility (Brilman, 2012; Easterby-Smith, Lyles & Petraf, 2009; Liu & Liang, 2014).

For this reason, the undertaken study focused on the high-tech enterprises (industry approach), which are generally the units focused on pro-innovation activities. According to the governmental report titled "Competitiveness of high-tech companies", "industry of high technology, due to high intensity of the processes of research and development, is a specific sector, the analysis of which provides not only information on the impact of R&D, but also on competitiveness and the ability of the economy to absorb the results of the work in the fields of science and technology" (Ministry of Economy, 2009, p. 3). These companies are characterized by specific features, which allow them to achieve competitive advantages over their

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<sup>1</sup> The classification of advanced technology industries was adopted in accordance with Polish Classification of Activities (PKD 2007) and included the following: (C 21), (C 26), (C 30.3), (J 59), (J 60), (J 61), (J 62), (J 63), (M 72).

large counterparts. It is possible to distinguish, amongst others, the following (Glinka & Gudkova, 2011):

1. More flexible management structure than in the case of large companies.
2. Less bureaucracy, which provides greater freedom of action for businesses and the possibility of an easier assignment of innovative activities as priorities in the development strategy.
3. The possibility of freezing a much smaller share in earlier generations of technology than in the case of large companies.

The choice of the territorial scope was due to the fact that the region of Greater Poland during the period 2008-2012 significantly differed in comparison to other provinces in the country in terms of the size of investment in innovative activities and R&D activities of small and medium-sized industrial and service enterprises, as well as in terms of the largest number of significant concentration of the people employed in high-tech industries (PARP, 2006).

The analysis of data obtained from the statistical office indicated that 215 entities had met the criteria for selection defined in the project. The study was complete for the given population. Finally, the participation in the study (using CATI technique, i.e. Computer-Assisted Telephone Interview) was confirmed by 44 entities (maneuverability at 20%), of which 32 were small (10-49 employment level), and 12 medium-sized (50 to 249 employees) companies.

The main research tool was a survey consisting of 27 questions divided thematically into two parts. The first part concerned the degree of innovation and competitiveness, the other – social capital in the organization.

#### **4. INTELLECTUAL ENTREPRENEURSHIP IN LIGHT OF EMPIRICAL RESEARCH**

The basic premise of the study was the statement that "the challenges faced by today's organizations highlight the need to take into account not only quantitative factors but also qualitative indicators of competitiveness while creating competitive advantage" (Machaczka, 2014). Enterprises predestined to build such an advantage, especially by means of intangible assets, are companies belonging to the high-tech sector. Therefore, the questionnaire consisted of 17 questions about the resources and skills, which in the opinion of managers of these companies, allow one to gain competitive advantage. The distribution of replies is presented in the table below.

From the above set of resources (skills) constituting competitive advantage of companies respondents on a scale of 1 (lowest rating) to 5 (highest rating) most appreciated the following:

- human capital ( $m_e=5$ ,  $d=5$ ,  $\bar{x}=4,63$ );
- tendency of a company to learn ( $m_e=4,5$ ,  $d=5$ ,  $\bar{x}=4,18$ );
- social capital of employees ( $m_e=4$ ,  $d=5$ ,  $\bar{x}=4,13$ ).

These factors can therefore be considered as a set of determinants, which allow the creation of competitive advantage for small and medium-sized enterprises

in the high-tech sector of Greater Poland region. In addition, these results indicate that the analysed entities primarily value intangible resources so difficult to imitate and emulate and so crucial for the concept of intellectual entrepreneurship. The first tangible factor in the form of company's finances has been positioned sixth.

**Table 2.** The importance of resources and skills to shape competitive advantage

Assets	Median	Mode	Arithmetic mean
1. Human capital	5	5	4.63
2. Company's eagerness to learn	4.5	5	4.18
3. Social capital of employees	4	5	4.13
4. Social capital in relation to business partners	4	5	3.95
5. Flexibility of organizational structures and activities	4	5	3.63
6. Know-how and corporate image	4	4	3.95
7. Research and development activity	3	3	2.86
8. Shortening the period of the commercialization of results	3	3	3.13
9. The processes of organizational learning	3	3	3.30
10. Patents and licenses	3	1	2.63
11. The state of company's finance	4	4	3.95
12. Implemented innovations	4	4	3.95
13. Quality management system	3	3	3.50
14. Company's location	3	4	3.04
15. Machines, production equipment	3	3	3.18
16. Logistics	3	3	3.00
17. Others	3.5	4	3.16

Source: own study.

The highest importance attributed to human capital – the aggregate of knowledge, skills and experience, clearly shows that these elements are treated by the analysed companies as a strategic resource in which it is necessary to invest. This approach is consistent with the concept of a knowledge-based economy which, from a microeconomic perspective, assumes that knowledge remains an undisputed source of competitive advantage for most businesses, including those of small and medium size (Koźminski, 1996). Moreover, according to Edvinsson and Malone (1997, p. 34), human capital embodies the dynamics of an intelligent organization through its creativity and innovativeness. It is worth noting that among the 44 surveyed units there are 32 innovative entities, i.e. those which have introduced innovations in the past three years.

In the opinion of the respondents the second most important factor (also in this case an intangible production factor) is a company's eagerness to learn. This resource becomes crucial in the context of the acquisition of competitive advantage in a situation where "sustainability has been devalued, while transience is rapidly gaining value" (Bauman, 2001, p. 161). Therefore, a specific challenge faced by enterprises today is the relentless "creative destruction" in thought and action, as addressed by J.A. Schumpeter (2014, p. 192), who identified it with the impact of the implementation of innovations, when "better behaviour forced the destruction

of the old". Thus, Schumpeter played a significant role in the rejection of the neo-classical approach to equilibrium and stability. As Szymański (2012, p. 169) aptly adds, "the market is changing in an erratic and turbulent way. On the other hand, the company itself faces difficulties in adapting to changes, and it regards especially its leadership, which does not demonstrate an adequate capacity to change and remains in with its behaviours in the old era of continuity. [...] As a consequence, it causes an imbalance between the market reactions and the reactions of enterprises". Therefore, the importance of organizational learning also increases. It is a process in which the acquired knowledge increases the ability to both solve current problems, as well as undertake more effective actions (Wang & Ahmed, 2007; Zott, 2003). Thus, this process facilitates a high flexibility of action (Brett, 2002). Similar conclusions have been reached by Senge (2006), who stated that organizations that are able to build competitive advantage in the future are those which can take a fresh look at the place and importance of social capital of a given organization, and those, which will learn to use the involvement of employees and their ability to learn in a right way (Chen, 2008; Wang, Cheng & Lin, 2013).

The third important factor that managers of the analysed companies recognize is the importance of their employees' social capital – their mutual relationships based on, *inter alia*, trust, loyalty, or even credibility in the process of gaining competitive advantage. Entrepreneurs should, therefore, take measures to strengthen trust (which constitutes a fundamental resource of social capital) between employees and their superiors as well as among employees themselves. This fact is especially important in the light of a very low trust of employees towards their superiors observed in Poland. As becomes clear from the research of the Institute Great Place to Work Poland, less than 50% of workers share the opinion that business is conducted in an honest and ethical way, and that they feel appreciated in their work environment (Forum Odpowiedzialnego Biznesu, 2015). For this reason, the fact that social capital is valorised in the analysed companies is encouraging. The more so with the fact that a number of studies confirm its positive impact on economic activity (Adler & Kwon, 2002; Coleman, 1990; Fukuyama, 1996; Granovetter, 1973; Lin, 2000; Nahapiet & Ghoshal, 1989). It is now seen as a pro-development factor affecting the success of an organization and the achievements of individuals, because it reduces opportunistic behaviours, incites greater accountability in economic interactions, and provides access to resources, including tacit knowledge and its faster diffusion between employees (Gajowiak, 2010). As noted by Grzanka (2009, p. 126), social capital allowing access to important information and other strategic resources has a significant impact on the ability of companies to adapt to both challenges and opportunities that emerge in the environment. The more possibilities for interaction between employees, the more social capital is created, "which results from the fact that new knowledge accumulated by a company creates new opportunities in the environment". Thus, it seems true that knowledge and values shared by people slowly replace three elementary principles of competitiveness, namely cost advantage, higher quality of goods and services and the speed of response to customer needs (Grzanka, 2009). Moreover, as stressed by F. Fukuyama,

social capital is the driving force for innovative behaviour, and its absence may act as a drag for such a behaviour (Fukuyama, 1996). Entrepreneurship, including the intellectual one, is based on the phenomenon of social interaction and the methods of operation of business entities are the result of "a game of interinfluence and negotiation" (Gajowiak, 2013, p. 62).

It should also be added that in the context of intellectual entrepreneurship it is worth pointing to organizational capital. And so, according to the study, the representatives of high-tech SMEs from Greater Poland (over 80% of them) attach importance to the development of organizational capital by introducing, inter alia, the latest quality systems and software for data storage and processing.

## 5. CONCLUSIONS

Over the last few years a model focused on continuity and evolutionariness has been created among entrepreneurs. This model, however, is becoming inadequate in a situation of discontinuity of the modern world. As rightly pointed out by Szymanski (2011, p. 164) "the unsuitability of enterprises for non-linear change is an expression of insufficient capacity for creative destruction in thinking and action". Therefore, it becomes necessary to use the resources (particularly the intangible ones) intelligently, and aim at increasing pro-innovation behaviour. The role of intangible values continues to rise, as the existence of modern organizations is conditioned by innovations mentioned herein as well as by gaining the trust of customers, by creating brand and by effectively responding to changing reality. Baron and Armstrong (2007, p. 11) conclude that "the success in these areas depends precisely on the people". Thus, organizations aspiring to be "intelligent" must base their activities on intellectual capital representing the following three basic elements: human capital, social capital and organizational capital. It remains undisputed that in addition to extensive knowledge and highly skilled employees, crucial to further development of a company are social skills, which determine the acceptance common values and common culture, and sharing them (Hayes & Upton, 1998; Teece, Pisano & Shuen, 1997). Thus, social capital becomes a resource enabling the transfer of knowledge between employees, as well as between a company's closer and farther surroundings. Taking it into account contributes to the reduction of transaction costs and increases the innovativeness of business entities. Therefore, it can be equated with the common good worth investing in (Lauzikas & Dailydaite, 2015). As aptly noted by Będzik (2010, p. 15), "in the face of the depletion of cheap resources and easy ability to achieve economic growth, the socio-economic development regarding all aspects of life in highly developed societies would not be possible without strengthening ties and trust among the members of society. Whatever the next step in evolution will be called, civil and information society, knowledge-based economy, each form requires cooperation, ties, the flow of information and trust".

The survey conducted among high-tech SMEs from Greater Poland confirms that these enterprises base their actions on intellectual capital, which becomes the

most important element of business management in the strategic perspective. Thus, their actions are consistent with the concept of intellectual entrepreneurship. The managers of these companies are aware that human capital, the willingness of a company to learn, and social capital created among employees are the most important factors influencing company's position on the market. These three elements are crucial in the context of the creation of their innovative attitudes and behaviour.

The main limitation of the study is its sample size. 44 entities from the total group of 215 companies, which met the criteria of the project, took part in a survey. As a fact, the results may not be generalized in regard to the level and kind of competitiveness of high-tech sector. Secondly, as discovered while conducting the study, not all companies were not "high-tech", as they have not created so far any innovations and the level of expenditures spent on R&D is less than 5%. That problem is commonly and strictly connected with "industry approach" to high-tech sector, which was assumed in the study.

It should be also emphasize here, that it would be interesting to conduct in the future comparative study taking into account small and medium high-tech companies with the biggest ones and getting to know which of them base their functioning more on intellectual capital and in how the managers approach the developing this crucial resource.

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