

Implementation of intelligent solutions in Polish companies - opportunities and barriers

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Abstract: Modern knowledge-based economy requires business management based on intelligent solutions serving the effective use of knowledge possessed and abstracted. To meet the requirements enterprises try to transform into the intelligent organizations whose main attributes are: high sensitivity to incoming external and internal signals, ability to quickly and properly respond, and the ability of continuous learning. The aim of the article is to show the importance of intelligent solutions and tools for improving the management process of the modern enterprise, as well as to identify the opportunities and barriers of implementation of these solutions in Polish companies.

Keywords: intelligent organization, knowledge management, intelligent solutions

JEL classification: M14, M 31, O3

1. Introduction

In recent decades followed the dynamic changes of socio-economic, due to the rapid pace of technological progress in the field of information and telecommunications and the growing globalization. The economy, despite economic fluctuations, entering a new era, characterized by order based on knowledge, creativity, intellectual capital, progress in the field of telecommunications and computerization, as well as new structures and organizational activities. These factors shape the modern enterprise environment that is becoming increasingly turbulent and unpredictable. There is a growing and intensifying competition in international markets, which requires consideration of intercultural aspects in the management and use of tools of international marketing (Supeková and Janáková, 2014). Compete effectively in such an environment requires the ability to respond quickly, willingness to change and attitudes to the need for continuous learning. The answer to these challenges is the use of intelligent management methods and tools, such as flexible organizational structures, systems monitoring and early warning, controlling instruments of strategic and operational databases and data warehouses, modern IT systems, etc.

The aim of the article is to point out the importance of intelligent solutions for improving the competitiveness of the modern enterprise and to identify the severity of Polish enterprises in implementing these solutions. The basis for assessment is the analysis of the results of research carried out in the framework of the PAED research project (PAED - Polish Agency for Entrepreneurship Development).

2. What is the intelligent organization?

In case Intelligent organization is a learning organization, having the ability to capture, create, organize, and share knowledge and use it to improve operating efficiency and enhance competitiveness in global markets (Łobejko, 2009). As intelligent enterprise is defined such

company which is able to effectively manage knowledge and intellectual capital in order to gain and maintain competitive advantage. Knowledge becomes the primary determinant factor in the functioning and success of the company in the Information Age [Kromer, 2008]. In order to acquire and expand knowledge of the company can use multiple internal and external sources. It should also result in the transfer and exchange of information with entities environment, especially with its stakeholders. Dialogue with stakeholders is a very effective management tool, servant obtaining valuable knowledge. Planned and conducted in accordance with the guidelines of AA1000SES dialogue can bring many benefits of minimizing the risk of a crisis to generate innovative solutions and build a positive reputation of the company as a responsible organization, open, transparent and trustworthy (Szwajca, 2015a). Is also worth noting that an important verifier intelligence enterprise is its approach to the crisis and how to manage crisis (Szwajca, 2015b).

Organizational learning is learning to employees within the organization. The learning process is a continuous up-skilling of workers, college, participate in training, as well as the exchange of information with the entities environment. Learning always involves entities (people), but intelligence organization (enterprise) arises only when the learning process is a team covering all employees - from management to staff representatives of the executive.

The intelligent organization plays a key role intellectual capital, or resources related to knowledge. In the traditional, narrow terms of intellectual capital it is identified with human capital, which includes knowledge, skills, abilities, personality traits workers, and they create teams (synergies). However, in the modern approach, a broad intellectual capital is understood to structure consists of several components (Szwajca, 2010; Szwajca, 2012).

The most commonly mentioned three or four components of intellectual capital:

- Market Assets, Intellectual Property Assets, Human-centred Assets, Infrastructure Assets (Brooking, 1996),

- Organizational Capital, Human Capital and Customer Capital (Ross, 1997),

- Human Capital, Structural Capital and Relationship Capital (Guidelines for..., 2002).

In addition to human capital, the most frequently mentioned structural capital, organizational and relational. Structural capital is mainly related to infrastructure and apply to expenditure on research and development (R & D) in the enterprise. Organizational capital refers to the processes, infrastructure, culture and organizational structure, management methods and tools. In contrast, relational capital includes knowledge and benefits from external relations with such entities as: customers, collaborators, suppliers, dealers.

The literature refers to a number of features and attributes of intelligent organization. Among the most important should be noted: the ability of early recognition of opportunities and threats, flexibility, the ability to respond quickly to change, adaptability, learning from mistakes, continuous improvement and competence of staff, implementation of modern information systems and management methods and tools.

According to Delic and Dayal Intelligent Enterprise should be: (Delic and Dayal, 2003)

- agile - it can launch a production order very rapidly after, for instance, closing a Web-based purchase;
- adaptive, self-regulating, self-optimizing - it can adjust key business parameters (revenue, profit, cost) to the short-term, changing business climate;
- with fuzzy borders, mesh-like structure - it can restructure and scale the organization to fit dynamic needs, as in outsourcing or complete outsourcing, for example;

- self-aware, aware of the markets and able to learn from them and adapt to them - it can deal with internal inefficiencies, bottlenecks and latencies and coordinate them with perceived market changes, for example, knowing the level of goods being produced, correlating this information with the market niche real-time situation, and jumping quickly into a price reduction campaign on the Web;
- able to morph into new and better forms - this is a long-term process in which we may not even guess what will the final form look like; it will include not only adjustments of the business and operational parameters, but also major structural changes; deciding for mega-merge or drastic resizing while changing the industry branch, for example.

In conclusion, we can say that smart business is one that is based on knowledge management and use of intellectual capital as a source of competitive advantage and market value (Caputa, 2008). Most operating on the Polish market of enterprises recognizes the need for the deployment of intelligent solutions and sees related benefits such as the ability to develop new markets, strengthen our competitive position, shape a positive image and brand recognition, reduced marketing costs (Ginter and Kałuža, 2013). However, in practice, few companies use intelligent management tools, and knowledge management systems.

3. The PAED research project - aims and objectives¹

In 2010, the Polish Agency for Entrepreneurship Development (PAED) commissioned a research project entitled "Intelligent organizations - knowledge management and competence of employees." The main objectives of the project was to answer two basic questions:

1) Is the SME sector in Poland use (and if so, to what extent) with intelligent solutions relevant organizations and whether these actions improve the competitiveness of companies (and, if so, in what areas)?

2) What barriers limit the development of knowledge management in the SME sector? The main part of the research project was a quantitative survey, which was conducted in May and June 2010. It uses the technique of direct interviews using a survey questionnaire on paper (PAPI). The study sample consisted of 800 small, medium and large enterprises. Inclusion in the study of large companies had to give a broader context analyzed the problems and allow for a comparison. Sampling was done by stratified sampling according to the criterion of company size and sector of activity. The procedure followed draw ensured the generalizability of the results to the population of enterprises in Poland, employing over 9 workers.

For the project we assume that intelligent organization is one that meets all of the following four conditions (Fig. 1):

(1) has formalized (written down) development strategy, which sets out long-term development goals and ways of achieving them,

(2) has formalized (written down) policy of human resource management (including recruitment, remuneration and human resources development),

(3) has a website and intranet, and uses specialized computer programs,

(4) in addition to the exchange of information when buying or selling in another way exchange knowledge with the environment.

¹ Based on: Kordel P., Kornecki J., Kowalczyk A., Krawczyk K., Pylak K., Wiktorowicz J., Inteligentne organizacje – zarządzanie wiedzą i kompetencjami pracowników. PARP, Warszawa 2010.

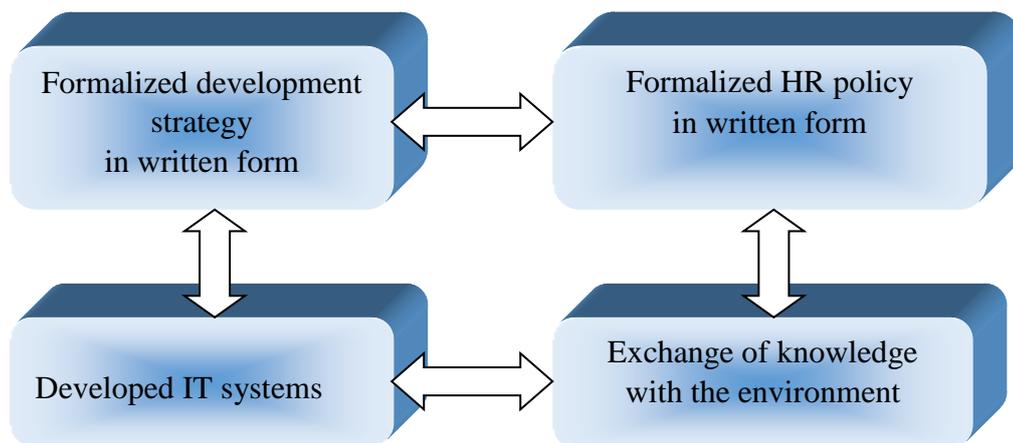


Figure 1 Criteria for classifying an undertaking for the intelligent organization

Source: Kordel P., Kornecki J., Kowalczyk A., Krawczyk K., Pylak K., Wiktorowicz J., *Inteligentne organizacje – zarządzanie wiedzą i kompetencjami pracowników*. PARP, Warszawa 2010, p. 80.

In each of the highlighted areas of "intelligence" company can manifest itself in a certain way. Under a formalized strategy may be manifestations of intelligence:

- knowledge of what knowledge is most important for the development of the company,
- the existence of the person responsible for the collection, processing and use of knowledge,
- the use of different methods of strategic control using not only financial indicators, but also non-financial indicators, for example. Determining the efficiency of processes, customer loyalty, effectiveness of training etc.,
- use a variety of sources and gathering tools of knowledge,
- having public electronic databases of experts, in which you can find employee / professional according to the competences sought.

For the area of human resources management policy formalized among the manifestations of intelligence are:

- formalizing elements of HR policy: the policy of recruitment, motivation and remuneration policy, policy training and development of employees,
- the use of periodic evaluations of employees,
- the use of different methods of motivating employees,
- planning staff training,
- existence of a system of evaluation of training effectiveness.

For the developed systems which can be used by smart organizations are among others: Enterprise Resource Planning (ERP) systems, Electronic Data Interchange (EDI), Product Lifecycle Management (PLM), Human Capital Management (HCM), Supply Chain Management (SCM), B2B systems, strategic decision support systems, so-called. Business Intelligence (BI), Customer Relationship Management (CRM), Intranet, electronic circulation of documents, databases and data warehouses.

With regard to the fourth region, in addition to the exchange of information during the purchase and sale of the company can acquire knowledge in dealing with public administration at central and local non-profit organizations, universities and R & D institutions, with financial institutions (e.g. banks, equity funds), competitors and so on.

4. The implementation of intelligent solutions in the Polish companies

The principal problem raised in the study was to identify the severity of companies operating on the Polish market in implementing intelligent solutions. It turns out that only just over 12% of the surveyed companies (99 of 800) meets all four criteria assigned to the intelligent organizations, that these companies can be called intelligent (Fig.2). Other companies meet three, two or one criterion, and almost 35% of entities do not meet any of the highlighted criteria.

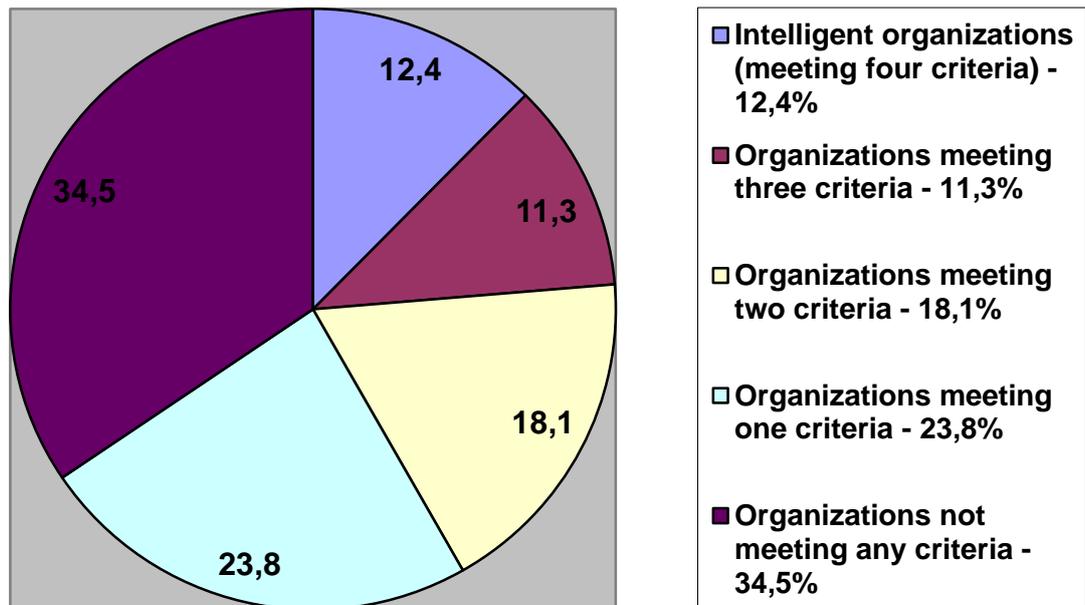


Figure 2 Structure of surveyed companies according to the number of fulfilled criteria

Source: Kordel P., Kornecki J., Kowalczyk A., Krawczyk K., Pylak K., Wiktorowicz J., *Inteligentne organizacje – zarządzanie wiedzą i kompetencjami pracowników*. PARP, Warszawa 2010, p. 81.

Among the companies that meet at least one criterion most (47%) has developed systems, 38% of exchanges information with the environment, 32% have a formal policy for managing human resources, and only 27% have a formal strategy development.

When it comes to diversity results due to the size of the company, it's definitely more intelligent solutions are used in large entities. As many as 40% of them meet all the criteria, and about 63% have a formal strategy development and human resources management policy. With respect to midsize companies for intelligent you can be considered roughly every fourth company, and among the small companies - only one in ten. According to the analysis due to the profile of the largest share of smart organizations reported among industrial companies (14%) and merchants (12%), and lowest among construction companies (5%).

Smart companies (12,4%) differ from other surveyed companies, in many respects, including in terms of:

- 1) used sources of knowledge,
- 2) the number and type of environment entities, with whom they contact and exchanges information,
- 3) used solutions,
- 4) the degree of formalization of policies of human resources management.

Smart organizations to a greater extent than other organizations use various sources of knowledge. The most common are: Internet, training, internal and external, trade publications and research papers, conferences, fairs and symposia, Intranet and reports from internal tools (sales, production monitoring, etc.). The biggest difference in the use of sources of knowledge for the benefit of intelligent organizations include: Intranet (36 pct.), Reports of internal tools (32 pct.) And Knowledge draw off the external training (30 pct). This is illustrated in Fig. 3.

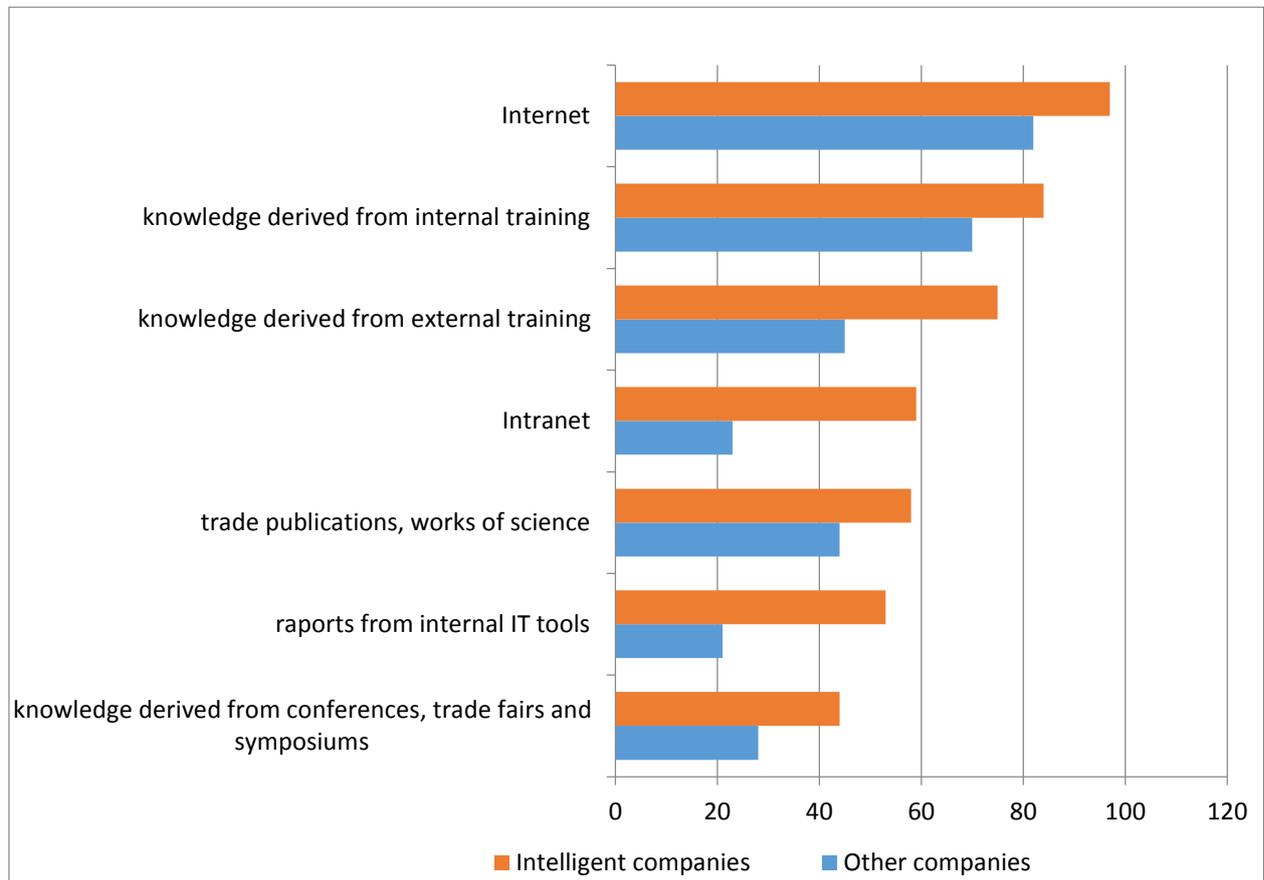


Figure 3 Sources of information used by intelligent and other companies

Source: Own work on the basis: Kordel P., Kornecki J., Kowalczyk A., Krawczyk K., Pylak K., Wiktorowicz J., *Inteligentne organizacje – zarządzanie wiedzą i kompetencjami pracowników*. PARP, Warszawa 2010, p. 110.

All surveyed companies, both intelligent and others, most often exchange knowledge with customers, suppliers and companies with a similar profile, do not constitute competition. You can, however, be noted that smart organizations are somewhat more open to contacts with entities environment (Fig. 4).

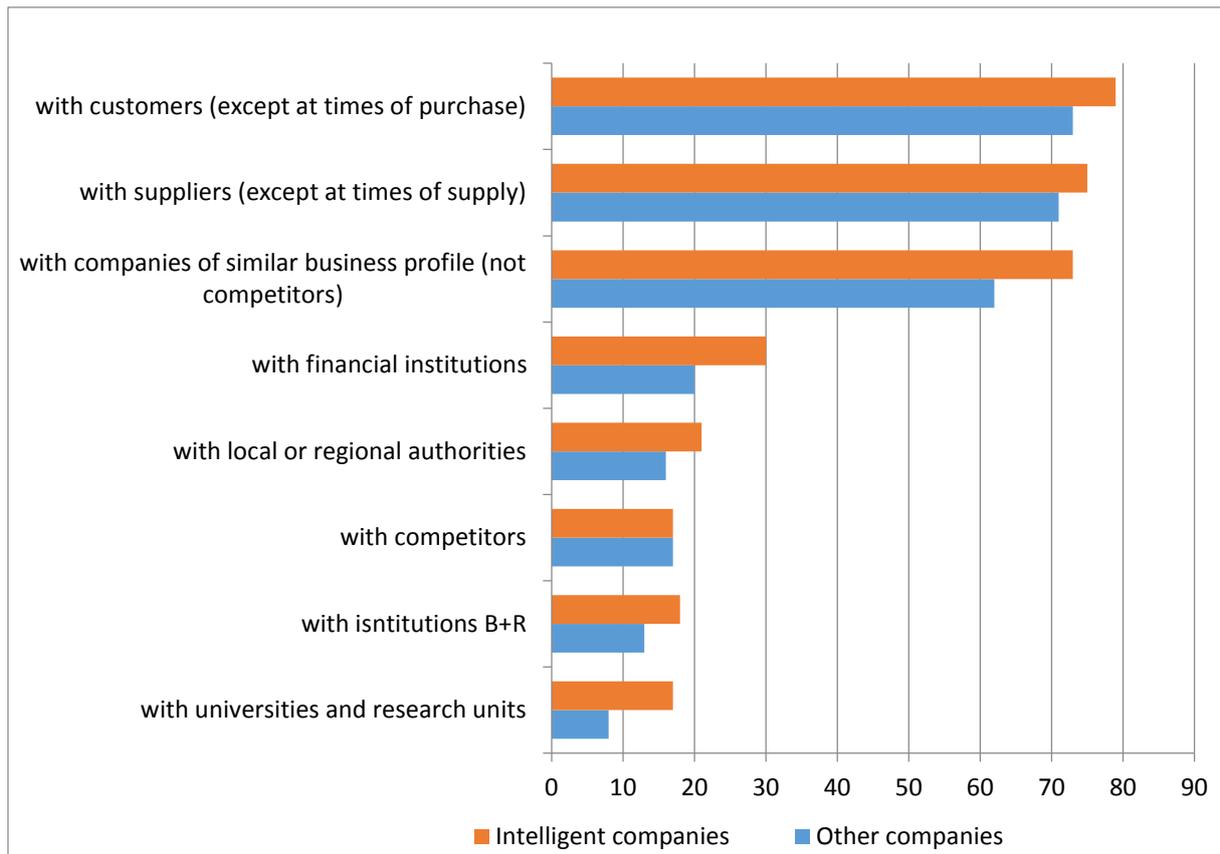


Figure 4 Entities environment that intelligent and other companies exchange knowledge

Source: Own work on the basis: Kordel P., Kornecki J., Kowalczyk A., Krawczyk K., Pylak K., Wiktorowicz J., Inteligentne organizacje – zarządzanie wiedzą i kompetencjami pracowników. PARP, Warszawa 2010, p. 108.

The biggest differences relate to the exchange of knowledge with companies with a similar profile of activity does not constitute competition (73% vs 62%), with financial institutions, e.g. Banks, equity funds (30% vs 20%), with research and development institutions (18% vs 13%), with universities and scientific institutions (17% vs. 8%).

Most of the surveyed companies establish contacts with two or three types of environment entities. However, smart organizations have a broader relationship with the environment, exchanging knowledge with more types of partners: 25% of them maintain relationships with three types of partners, 20% - with four, 17% - with five. On the other hand, other companies frequently come into contact with 2-3 groups of partners, and about one in five (more than twice as often as in the case of smart companies) contacts only with one group entities. It is worth noting that the number of stakeholder groups increases with the size of the company.

Companies qualified to the group of intelligent organizations often use a variety of solutions to support knowledge management processes in comparison with other companies. The most commonly used tools include: electronic circulation of documents, databases and data warehouses, as well as intranet. Other solutions are already being used much less frequently - every fourth intelligent organization uses CRM - Customer Relationship Management (although twice as likely than companies that do not meet criteria for organizations intelligent) and solutions collaboration, every fifth - the practice of Human Capital Management, having marginal use in other companies, and every sixth - strategic decision support systems, so-called. Business Intelligence (three times more often than the other). This is illustrated in Fig. 5.

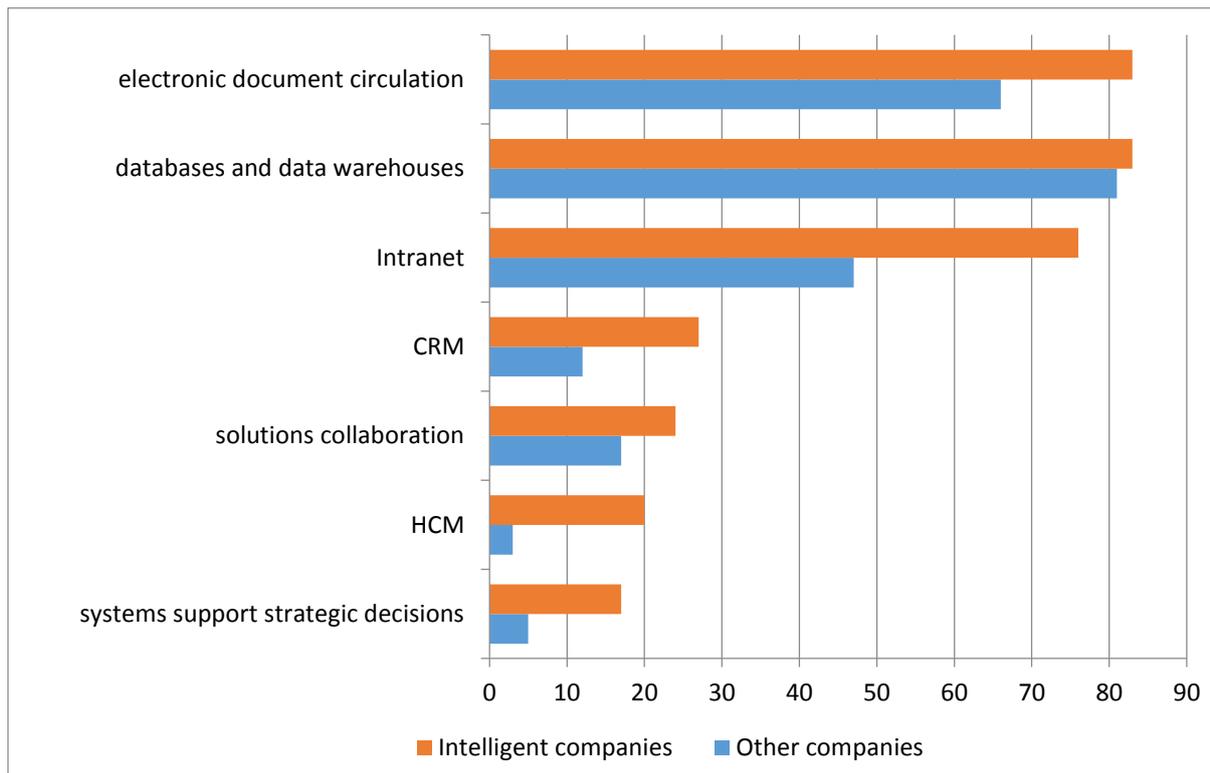


Figure 5 IT tools used by intelligent and other companies

Source: Own work on the basis: Kordel P., Kornecki J., Kowalczyk A., Krawczyk K., Pylak K., Wiktorowicz J., *Inteligentne organizacje – zarządzanie wiedzą i kompetencjami pracowników*. PARP, Warszawa 2010., p. 116.

It should also be noted that organizations apply a much more intelligent solutions to support knowledge management processes than other organizations. These organizations frequently uses five tools, while the largest group of other organizations use only one tool. In addition, organizations more intelligent appreciate the role of these tools in knowledge management and declare their further development in the future. Implementation of the solutions in the next 12 months planning every fourth intelligent organization (twice as often as in the case of other organizations). The vast majority of these companies (but also companies that do not meet the organization intelligent) plans to implement electronic document flow (100% of companies intelligent and 69% others), databases and data warehousing (96% and 75%) and Intranet (96 % and 50%). One in three intelligent organization plans during this period to implement more advanced solutions, namely systems: Human Capital Management, Customer Relationship Management and Business Intelligence solutions.

Regarding the formalization of HRM policy that smart companies have a much higher degree of formalization of activities in all areas of this policy (Fig. 6).

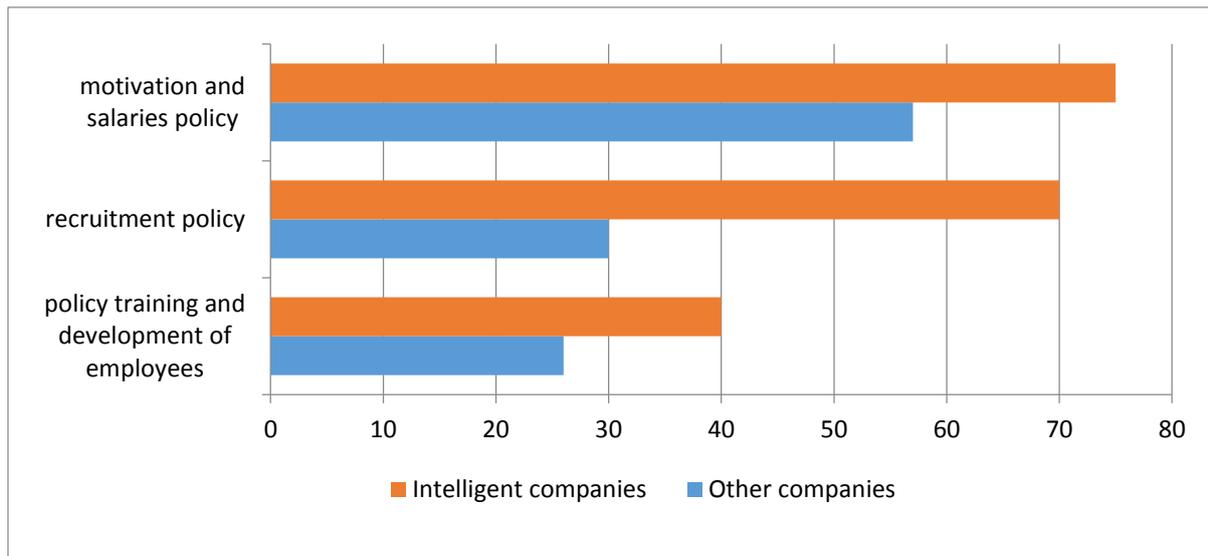


Figure 6 *The degree of formalization of the policy areas of human resource management*

Source: Own work on the basis: Kordel P., Kornecki J., Kowalczyk A., Krawczyk K., Pylak K., Wiktorowicz J., *Inteligentne organizacje – zarządzanie wiedzą i kompetencjami pracowników*. PARP, Warszawa 2010, p. 126.

The highest level of formalization has a policy of incentives and remuneration (75% of indications for smart companies to 57% for other companies). Slightly less formal is the policy of recruitment (70% and 30%) and the lowest degree of formalization of the policy covers training and development of employees (40% and 26%).

The study showed that the use of intelligent solutions to improve the competitiveness of companies. Smart business acquired in 2009 compared with 2008 definitely better economic results in comparison with other companies. First, turnover increased by an average of 1.11 million PLN and 40% of them raised employment. Meanwhile, other companies reported an increase in turnover of 0.08 million PLN and increased employment by 25%. High average employment growth of intelligent organizations occurred while reducing employment in every sixth enterprise of this kind, which could be the result of rationalization of employment related to the improvement of technological processes.

5. Barriers to the development of intelligent organization

Among the barriers to the development of intelligent organization can replace the financial barriers, technological, formal and legal, cultural, organizational and mental. Financial barriers are connected with the necessity of incurring financial outlays for infrastructure, software, and development and implementation of knowledge management systems. Technological barriers may exist in the area of information and communication technologies if the company does not have an adequate level of infrastructure development and access to high-speed broadband computer. Intelligent organization is developing well in a flexible, giving leeway environment. Formal and legal barriers may occur in the political and legal environment, if there are provisions restricting this freedom. Cultural barriers may relate unwillingness to cooperate and exchange information with other actors in the environment, resulting for example with envy. Restrictions apply organizational communication process within the organization and reluctance to spend money on risky ventures. Psychological barriers are related to the fact that in the intelligent organization of employees requires a

strong commitment to the development of the company and their own development through participation in training courses and cooperation with others. This implies the need to constantly improve their skills, qualifications, willingness to change and the need for continuous professional development.

The results showed that all of the analyzed companies feel the barriers to the development of knowledge systems, the smart companies feel them much less than the other (Table 1).

Table 1 Types of barriers to the development of knowledge systems

Type of barrier	Intelligent organizations	Other organizations
Financial	- lack of funds for additional posts at which employees dealing with issues related to knowledge management	- the high cost of training
Organizational	- failure to state reasons for spending on knowledge management	- lack of communication within the company between managers, leaders
Skills	- ignorance of this, what tools to use in knowledge management	- lack of skills acquisition
Cultural	- unwillingness to cooperate with other institutions	- reluctance to share knowledge
Mental	- lack of focus employees on the customer's interest	- customer skepticism, reluctance to new solutions
Others	- low quality of offered training	- low quality of computer software

Source: Own work on the basis: Kordel P., Kornecki J., Kowalczyk A., Krawczyk K., Pylak K., Wiktorowicz J., Inteligentne organizacje – zarządzanie wiedzą i kompetencjami pracowników. PARP, Warszawa 2010, pp. 148-149.

Following most common barriers for both types of firms are financial barriers. Smart business (usually small) mention the lack of funding for additional positions to which employees dealing with issues related to knowledge management, and other companies - high training costs. In second place were mentioned organizational barriers: lack of justification for spending on knowledge management - a barrier indicated by a smart company, and the lack of communication within the company between managers, leaders were administered by other companies. Among the barriers "skills" intelligent company as the most important reported ignorance, what tools to use for knowledge management, and other organizations - the lack of skills acquisition. Among the cultural barriers as the most powerful smart companies (especially big ones) showed reluctance to cooperate with other institutions, while the remaining companies - the reluctance to share knowledge. Psychological barriers are much more strongly felt by larger companies, both in the group of intelligent as well as other organizations in the smart dominates lack of focus employees on the customer's interest, and in the other biggest barrier is the skepticism of customers, aversion to the introduction of new

solutions. In the category of other barriers to smart organizations also low quality of training offered, and the other - the poor quality of computer software.

6. Conclusion

Based on the results of this study we can formulate a thesis that companies implementing smart solutions are more competitive and better prepared to function in today's global environment. They are open to the exchange of knowledge with third parties, it can accumulate and efficiently use. As a result, they can more quickly and efficiently respond to changes and generate new ideas and implement innovative solutions. Smart organizations place great emphasis on the development of human resources through the implementation of more effective incentive systems and flexible organizational structures. Of the 800 surveyed companies operating on the Polish market for just over 12% can be classified as a group of intelligent organization. Others are more or less advanced stage of implementation of intelligent solutions. The most important factors inhibiting the development of knowledge management systems in all surveyed enterprises are financial barriers, organizational and cultural heritage.

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