

MANAGEMENT OF ICT IMPLEMENTATIONS IN ENTERPRISES IN POLAND

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Abstract:

In order to develop and be competitive, modern enterprises, which function in an environment that is globalised, dynamic and subject to strong digitalisation pressure, need to implement information technologies in a way that will allow them, as they achieve further levels of virtualisation, to maintain, and even enhance, their ability to create value added. As business activity is moved to a space shaped by computers and IT networks and distance communication tools and forms are developed, the importance of establishing contacts and relations in the organisation and execution of value-creation business processes increases. Digitalisation of the economy and society is one of the most dynamic changes of our times, opening up new opportunities to create business models, while bringing uncertainty and various threats connected, among other things, with social consequences of the automation of production processes and security in a broad sense.

The aim of the presentation is to indicate areas of activity in which information technologies are most often implemented in enterprises in Poland as well as managers' strategic approach to this problem in the face of digital transformation.

The paper presents the level of Polish enterprises' engagement in the process of digital transformation and shows how the progress in terms of implementation of modern ICT in the aspect of customer contacts, managing and executing contacts with suppliers and recipients and resource configuration, impacts the effectiveness of the enterprises surveyed.

Keywords: management, ICT, enterprise

Introduction

Digitalisation as a continuous process of convergence of the real and virtual worlds is becoming the main driving force for innovations and changes in most sectors of the economy. Currently, the main factors driving the development of the digital economy include:

- the Internet of Things (IoT) and the Internet of Everything (IoE),
- hyperconnectivity,
- applications and services based on cloud computing,
- big data Analytics (BDA) and Big-Data-as-a-Service (BDaaS),
- automation and robotisation,
- multi-channel and omni-channel models of the distribution of products and services.

What is especially important is that current changes are radical, and in some cases even disruptive, bringing completely different values to market players and consumers. In order to cope with these changes, individual enterprises and whole sectors, public administration, society and national economies need to undertake digital transformation.

The paper presents the essence and significance of the rapid changes caused by modern information technologies and IT-based management tools implemented in enterprises in Poland as part of the so-called digital revolution. While five years earlier such tools were little known and rarely used in Poland, which was especially the case in small and medium-sized enterprises, today they are much more widespread, and entrepreneurs are increasingly aware that their businesses are determined by exploration and fast implementation of what Industry 4.0 has to offer.

The diagnosis of the virtualisation level of enterprises in Poland based on a 2013 survey was worrying. The majority of the enterprises in Poland surveyed did not take advantage of the possibilities offered by modern digital

technology. What is more, they showed inertia and conservativeness, viewing the technological possibilities as a fad, a passing trend in management that would generate high costs and a very long period of return. Therefore, the issue of digital transformation was not included in enterprises' strategies of action.

In the paper, the author adopted the view that virtualisation of business processes involves implementation of information technologies into business activity as well as creation of communication networks that are aimed at developing intra- and cross-organisational interpersonal bonds and relationships with customers, initiating and meeting virtual needs, and creating the architecture of business in cyberspace. Consequently, virtualisation was treated as a type of strategy reflecting three separate yet interrelated domains:

- Contacts with customers (virtual meetings) – refer to new challenges and possibilities connected with the interaction between an enterprise and its customers. The development of information technologies allows customers to use products and services remotely, actively participate in the dynamic adaptation of products to customer needs, and establish mutually supportive communities of customers (Rayport, Sviokla, 1994, Hagel, 1997).

- Configuration of assets (virtual sourcing) – refers to enterprises' needs for virtual inclusion in a network of commercial activity, as opposed to the vertical integration model of the industrial economy. Companies that use the Internet in commercial transactions can build a range of links and manage them in a way that allows them to accumulate and coordinate assets in a way that will generate customer value (Davidow, Malone, 1992, Goldman, Nagle, Preiss, 1995, Quinn, 1992, Lewis, 1995, Venkatesan, 1995)

- Development of knowledge (virtual experience) – refers to the possibilities of developing various sources of experience within and outside of an organisation. Due to information technology, knowledge and experience are becoming a driving force for value creation and increased efficiency of an enterprise (Venkatraman, J.C. Henderson, 1998, Drucker, 1998, Steward, 1997).

Digital transformation is based on a simple principle: it enables better cooperation by connecting people, places and things. This is important for every company. For that reason, an integral element of digital transformation is digital communication – both within an enterprise and within its external ecosystem. The ability to combine corporate data and services is of key importance for all aspects of an enterprise's activity – from product innovations and customer service to flexibility and operational efficiency.

By skilfully integrating three pillars of business operations: people (customers, employees, business partners, etc.), places (stores, factories, offices, warehouses, etc.) and things (production equipment, products, fleet of lorries, infrastructure, etc.) an enterprise can not only perform its processes much more efficiently but also constantly development new business models. The key to an effective combining of business areas is a skilful use of the solutions and technologies available on the market such as: public and private cloud, Internet connectivity, security solutions and increasingly widespread mobile services.

According to the participants of a survey on digital transformation conducted in August 2018 by editors of the "Computer world" magazine, the most important elements of this concept, as viewed by Polish managers, include: optimisation of the existing business processes through their digitalisation (58%), increase in employees' productivity through adaptation of modern IT solutions (such as group work tools, mobile solutions, AI and automation – 49%) as well as launching of digital distribution channels and access to services (45%). (Computerworld, 2018) A digital transformation survey was also conducted by the IDC analytical centre at the end of October and beginning of November 2017. The analysts found that the most important objectives of digital transformation were: reduction of costs (60%), improvement of the quality and attractiveness of the range of products and services offered (54%), improvement of business communication (43%) and improving knowledge about customers (32%).(IDC Poland, 2017)

Digital transformation encounters various barriers in Polish companies. One of the most important ones, which companies are often unaware of, is failure to include digitalisation and the use of new technologies in strategic documents. Only every tenth organisation operating in Poland has a strategic document in place dealing with digital transformation. Twice as many companies addresses this phenomenon in a comprehensive way as part of their overall strategy, with every fifth company (22%) only mentioning digital transformation in such a document. Almost six out of ten enterprises do not address this subject at all.

However, defining and appropriately prioritising the areas in which digital transformation should take place is of key importance. It is impossible to reorganise a few strategic areas simultaneously without harming an enterprise's day-

to-day operations. A methodical and thought-out strategy of change is required. A different approach should be adopted by manufacturing enterprises, where the main emphasis should be placed on streamlining production and logistics processes, and a different one by commercial companies, for which the role of analytical tools and customer service tools is of key importance.

Without solid strategic foundations, any organised prioritisation of activities or translating them into efforts aimed at the adaptation and development of IT environment would be difficult. A strategy that defines digital transformation in an enterprise is essential for introducing reliable performance indicators or managing the communication concerning implemented changes in a way that is transparent and understandable for customers and employees.

Lack of a strategy usually means that a company has not in place a developed and systematised vision of organisational culture change as well as related technological changes. Implementation of even the most cutting-edge solution will not bring about a qualitative change unless the existing processes in an enterprise are adjusted accordingly. This is a huge challenge for IT departments, which, in addition to the implementation of new systems, have to re-organise the existing solutions so that they can streamline the operation of the organisation after the changes are implemented. Strategic documents relating to digital transformation which describe planned activities and performance indicators make it possible to undertake efforts to translate the vision into concrete operational activities – both managerial and technological ones.

Digital transformation and management of innovative implementations in enterprises

Industry 4.0 is a relatively new concept and refers to an enterprise's production system that is composed of an information system and numerically controlled machines, which work autonomously and display elements of artificial intelligence. (Lee, 2013)

Other authors argue that since production processes are differently organised and run differently in different industries, the concept of Industry 4.0 should not be generalised in this way. (Kagermann, Wahlster and others, 2013) There is an increasingly widespread view that the scope of the definition of Industry 4.0 should be considered on an individual basis, depending on the needs of a particular enterprise. (Lasi, Fettke and others 2014). At the same time, the nomenclature of this new concept of an enterprise management changes, as the way of defining it evolves, with ever new terms introduced to refer to the phenomenon observed, e.g. Industrial Internet or Digital Factory. (Schmidt, Möhring and others, 2015)

“According to experts from industry and research, the upcoming industrial revolution will be triggered by the Internet, which allows communication between humans as well as machines in CPS throughout large networks. It introduces customized and flexible mass production technologies fostering once again novel interaction between technological change and industrial organization. Machines will operate independently or cooperate with humans in creating a customer-oriented production field that constantly works on maintaining itself. The machine rather becomes an independent entity that can collect, analyze, and offer advice based upon data. The idea behind Industry 4.0 is to create a social network where machines can communicate with each other, called the Internet of Things, and with people, called the Internet of People.” (Trento, Bannò and others, 2018).

According to Hermann M., Pentek T., Otto B. (Hermann, Pentek and others, 2015), the concept of Industry 4.0 encompasses areas that involve numerous technologies and related paradigms. Accordingly, the main elements that are closely connected with the idea of Industry 4.0 include: Industrial Internet of Things, cloud-based production, smart factories and cyber-physical systems.

The Internet of Things was first defined by Kevin Ashton in 1999. The author proposed the use of data transmission over the Internet using RFID to control the supply chain in the company Procter & Gamble. Currently, the Internet of Things encompasses all types of equipment, e.g.:

- domestic equipment (household appliance and multimedia equipment),
- security and health and life protection systems,
- automation systems, - passenger cars and lorries,
- production and logistics systems of an enterprise.

The idea of IIoT, like that of IoT, is to collect a large amount of data. In the case of the Industrial Internet of Things, data is collected from production processes and sent to data processing centres.

Cyber-Physical Systems (CPS) are defined as a combination of the computing layer and physical processes. (Lee, Bagheri and others, 2015) The integration most often takes the form of embedded systems and networks for monitoring and controlling physical processes. The control system of a production process works in a feedback loop. In this case, physical processes constitute the source of data for computing a signal controlling selected executing entities. The development of CPS can be divided into three phases:

- first generation of CPS – includes RFID technology,
- second generation of CPS – systems are equipped with sensors and actuators with a limited range of functions,
- third generation of CPS – systems are able to store and analyse data.

Smart Factory is a leading component, one of the main concepts of Industry 4.0. It is defined as a factory that purposefully supports human resources and machines in the execution of their tasks based on elements of a cyber-physical system and the Internet of Things. This means that the factory „will be aware and intelligent enough” to control the production process or keep machines and devices in a proper technical condition. Thus, there will be integration at all levels of production resources, e.g. sensors, actuators, machines and devices, robots, conveyors, etc. (Kagermann, Wahlster and others, 2013)

Social Product Development (SPD) is a relatively new concept in the world of product development. Without a clear definition as yet, the concept is assumed to mean engagement of a team of people within or/beyond an enterprise in the development of a product (qualified group of people). For that purpose, technologies, social tools and media are used in a way that allows users to have an impact on the product’s life cycle at every stage of its design process. (Peterson, Schaefer, 2014).

An important element that can support the implementation of the concept is virtualisation of processes occurring in an enterprise. By means of virtualisation elements, it is possible, using sensors, to monitor physical processes occurring in a organisation. Based on obtained data, it is possible to map physical processes and simulate how they work.

A virtual organisation is identified with a continuous process of organising in a highly computerised environment, involving a virtual space, a parallel reality created by computers, their software, network connections and communication technologies. According to Niedzielska, (Niedzielska, 1997) the idea of a virtual organisation is manifested in the form of multi-faceted and multi-factorial system transformations that take place in various economic entities in order to eliminate inefficient input channels, limit the routes of information stream flows and to convert heavy architectures into flexible organisational units characterised by high autonomy and high standard of operation.. „A virtual organisation is an organisation that uses communication technology as a substitute of material structures to enable diffusion and decentralisation of work and make an organisation more flexible and indefinite.” (Warner, Witzel, 2005). Virtualisation of enterprises shifts value creation processes into virtual space, where it is possible to offer intelligent products online. An intelligent product offered online in a virtual form is so constructed that a customer can choose such a part of it, an option of the offer, that best meets his/her expectations.

The value added contained in an intelligent product is usually high, as it is a product with a large potential of knowledge and technology, so large that not every customer can fully appreciate or take advantage of it. For a customer receiving a product with high value added when his/her expectations are significantly lower, the perceived value of such a product will be lower compared to the value perceived by the customer with higher expectations. In a network, the value of a product can be disassembled into its components, and a customer can choose the ones that he/she needs while resigning from the others, which, though valuable for other customers, are worthless to him/her. (Tapscott, 1999) The concept of an intelligent product facilitates the process of optimising relations between the value offered and the value expected by the customer.

Methodology

The first stage involved a study using a survey questionnaire carried out among enterprises in Poland. A total of 346 enterprises participated in the study, including 143 micro enterprises, 104 small enterprises, 48 medium-sized enterprises and 51 large enterprises; Including:

- 245 service enterprises and 101 manufacturing enterprises;
- 318 privately owned, 9 state-owned, 11 cooperative, and 4 employee ownership enterprises;

- 61.2% - self-employed economic activity; 22.8% – capital companies, including 28 joint-stock companies and 51 private limited companies.; 4.6% partnerships
- 60.1% enterprises operating 5 to 15 years; 5.2% – up to 1 year; 33.8 % - over 15 years, of which 24 (6.9%) operating over 30 years.

The second stage in order to assess the degree of enterprises' engagement in the process of implementing modern information technologies, a survey was conducted which covered 143 managers: 119 worked for companies from the SME sector, with the remaining respondents employed in managerial roles in large enterprises (24). The survey questionnaire consisted of a dozen questions concerning the perception of the issue of digital transformation and its inclusion into key strategic and organisational documents, enterprises' readiness to implement modern technologies, organisational culture, ICT use and achieved effectiveness.

Results of research: The use and objectives of application of information technologies in enterprises in Poland

In order to assess the importance of virtualisation of contacts with customers in value creation in the analysed enterprises, the question about the impact of IT technologies on the quality of relations with enterprises' customers was posed. Larger enterprises much more often declared higher expectations regarding the level of virtualisation of contacts with customers (Table 1).

Table 1. Values of r^2 and Yule's η coefficient for the use of information technologies and level of customer service

Problem	r^2	p	
The use of information technologies vs. level of customer service	46.793	0.0001	0.392

Source: own work based on a survey

Moreover, a clear positive correlation was observed between the achieved level of virtualisation of contacts with customers in enterprises and their economic and financial situations (Table 2).

Table 2. Values of r^2 and Yule's η coefficient for information technology employed in enterprises and assessment of the economic and financial situations

Problem	r^2	p	
The information technology employed in an enterprise in the area of customer service vs. an enterprise's economic and financial situation	28.807*	0.0001	0.288

Source: own work based on a survey

A higher level of virtualisation of contacts with customers comes with a better assessment of an enterprise's economic condition (higher capacity for generating value added).

The study confirmed a significant relationship between an enterprise's size and the degree of technological advancement in configuration of assets (Table 3).

Table 3. Values of r^2 and Yule's η coefficient for an enterprise size and the level of employed information technologies

Problem	r^2	p	
The level of employed information technologies vs. the size of an enterprise	58.247	0.0001	0.446

Source: own work based on a survey

The bigger the enterprise, the higher the level of information technologies used to acquire resources. In order to assess how virtual sourcing impacts an enterprise's capacity for value generation, correlation was examined between the degree of virtualisation of the configuration of assets in enterprises and their assessments of their economic and financial situations (Table 4).

Table 4. Values of χ^2 and Yule's γ coefficient for virtualisation level and enterprises' economic and financial situations

Problem	χ^2	p	γ
Level of virtualisation of the configuration of assets vs. assessment of an enterprise's economic and financial situation	26.983*	0.001	0.279

The study confirmed a positive, statistically significant moderate relationship between the level of virtualisation of the configuration of assets and the assessment of the economic and financial situation. The higher the level of information technology and tools used in establishing and maintaining contacts with suppliers, the better the assessment of the enterprise's economic and financial situation. (Ziółkowska, 2013)

Conclusion

The results of the studies confirmed the hypothesis about a positive relationship between the degree of virtualisation, as determined by the quantity and technological advancement of the IT tools and systems in enterprises and the way they are used, and an enterprise size and the industry representing the main area of its business activity. Large enterprises more often (statistical significance) achieved higher levels of process virtualisation in all the virtuality vectors analysed. Likewise, enterprises, irrespective of their size, showed higher levels of virtualisation if they operated in modern industries where information technology is a component of offered products/services and is directly used in creating customer value added. Among the industries where the highest level of virtualisation was achieved were: information and communications, finances and insurance, repair and maintenance of computers and communication equipment, and science and technology. Traditional industries, including in particular construction, hospitality and food, and trade and repairs, are characterised by a lower level of virtualisation of their activity in all the domains (virtualisation vectors) analysed.

An increase in enterprise value is determined today by the implementation of modern IT solutions, both in the area of internal processes and relationships with the environment. The study shows that enterprises more often identify their value with their property, the sum of tangible and intangible assets, than with market value or income value. They see customers and market outlets as the main source of value increase. Therefore, in their value increase-oriented activities they most often concentrate on customer satisfaction or, in the case of large companies, on the execution of processes that create customer value added. Better assessment of the economic and financial situation comes with a better assessment of employees as a source of value increase and the impact of customers and market outlets on enterprise value.

Almost half of the enterprises surveyed had a formalised strategy in place, but only one fourth used it to govern their day-to-day operations. Processes performed in enterprises are more often perceived instrumentally – as a value creation instrument than as its source. That's why their virtualisation is often omitted at the strategy level except for those enterprises where information technology is part of the range of activity.

A better assessment of the economic and financial situation came with a better assessment of the impact of the processes performed in an enterprise on its value. As far as risk factors for enterprise value were concerned, enterprises most often indicated competitors. However, competitors are a concern mostly for small enterprises. According to large companies, it is rather difficult macroeconomic situation as well as poor organisation and course of the processes performed in an enterprise that put their value at risk. The study confirmed a statistically significant relationship between enterprise value and activities aimed at boosting innovativeness, efficiency and effectiveness of the processes performed in an enterprise. By analysing the responses provided in the survey and comparing them against the virtualisation levels defined in the author's Descriptive Model of Virtualisation Levels (Ziółkowska, 2013) it was found that virtualisation is an important tool for value increase in all of the areas analysed, from the quality of contacts with customers through establishing and maintaining contacts with suppliers and buyers in terms of configuration of resources, to acquisition and development of knowledge and competences in enterprises.

Summing up, defining the demand for the level of virtualisation of selected value creation processes at the stage of a strategy design would allow an enterprise to achieve such a level during the implementation of its strategy and to generate a higher value added. Planning of innovative IT implementations that impact the virtualisation level of value creation processes taking into account the value increase determinants as presented in the proposed Model for

aligning virtuality dynamics with the strategy for managing by values (Ziółkowska, 2013) may contribute significantly to an increase in an enterprise's effectiveness.

Results of research: Managers' decisions and strategic actions in the face of digital transformation

Asked about the key characteristics defining digital transformation, Polish managers indicated above all digitalisation, virtualisation and optimisation of the existing business processes (58% of those surveyed), increased productivity of employees thanks to modern IT tools and implementation of digital channels of access to services (45%). Other areas associated with digital transformation of enterprises included: improvement of managers' capabilities thanks to data analysis, contextualisation of contacts with customers and bringing IT departments closer to business.



Figure 1. Digital Transformation According to Polish Managers

Resource: own study own study Digital transformation in Polish companies, Computerworld 2018

Whatever the IT architecture model adopted and developed in a company, ensuring scalability and easy management of services boils down to a common denominator: implementation of solutions in which the basis is programmable resource pools - whether in the form of services provided by external providers or a private cloud or various intermediate models (hybrid, multi-cloud ones).

For the purpose of the study, a list was prepared containing technological solutions whose presence in an enterprise's IT environment is necessary or at least highly desirable in digital transformation processes. Next, participants of the survey were asked to indicate which of the solutions on the list had been implemented in the technological environment of their organisations.

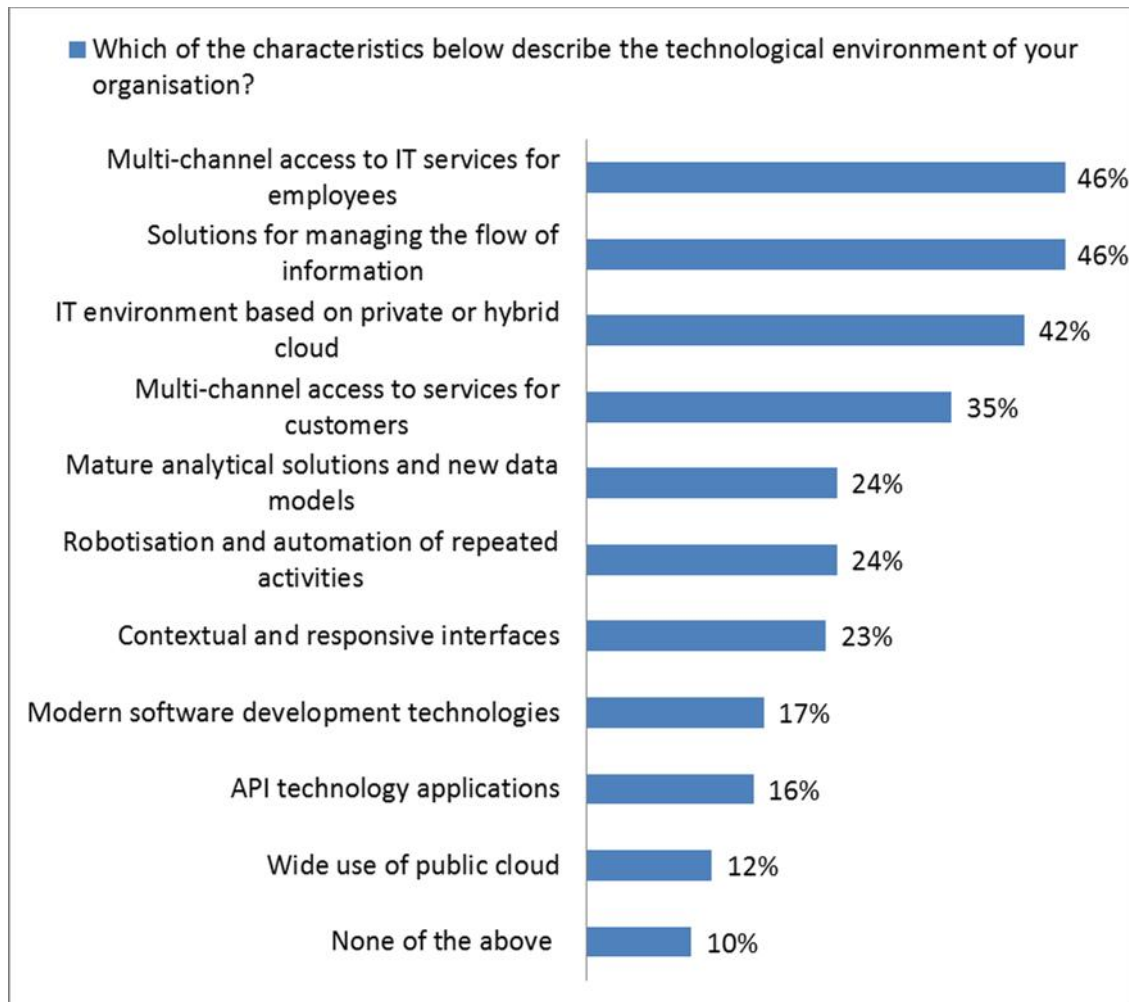


Figure 1. Technological Environment of Polish Enterprises

Resource: own study Digital transformation in Polish companies, Computerworld 2018

More than four out of ten respondents (42%) declared that private or hybrid cloud constituted the technological basis in their company. Some companies were able to proceed to create private clouds based on programmable solutions, such as VMware, Nubium or OpenStack. Even though some of the implementations classified as private or hybrid cloud are not pure resource pools but virtualised individual elements of infrastructure (most often servers, more and more often mass storage devices and networks), it is evident that the popularity of systems with software tier is increasing.

On the other hand, the share of public cloud in IT environment was once again lower than in the West - merely 12% of those surveyed declared a widespread use of services of this type. According to this year's TOP200 report by Computerworld, in 2017 the market of public cloud in Poland was worth PLN 860.8 million, i.e. it increased by almost 18% compared to 2016 (PLN 731.6 million). As impressive as this increase may seem, it still accounts for merely 6.1% of the whole market of IT services (PLN 14 billion) and 1.4% of the value of IT market (PLN 60.7 billion). Strikingly, relatively few enterprises (16%) use API interfaces or tools for cloud environment management. This means that the implemented cloud solutions are often of silo type and are only limited to selected areas of an enterprise's activities. ([Pietruszy ski](#), 2018)

Technological elements that are most often implemented in Polish organisations include: solutions ensuring a multi-channel access to IT services to employees (46%) and customers (35%) and systems for managing the flow of documents and information (46%).

Conclusions

Knowledge of digital transformation and key elements of this process seems to be widespread among Polish companies. 55% of Polish managers think that digital transformation requires huge expenditure on infrastructure. Even more (57%) do not plan digital transformation. Only 20% of Polish companies developed detailed transformation plans. In the context of the development of technological infrastructure in view of digital transformation, it is worth stressing that only 10% of Polish organisations have a strategic document in place addressing this issue. Another 10% addressed this phenomenon in detail in the organisation's overall strategy. Further 22% of enterprises and institutions mentioned digital transformation in strategic documents without giving more attention to it. The remaining participants of the survey - almost six out of ten companies (57%) - did not even mention digital transformation, of which more than every fifth company (22%) did not possess any documents describing organisation strategy. Among the biggest threats posed by digital transformation, those surveyed indicated above all high costs of building modern IT environments (55%), ensuring appropriate level of security (42%) and difficulties with managing ever more complex IT environments (41%). More than a quarter (28%) of the respondents participating in the survey considered the lack of strategic documents that take into account digital transformation as one of key barriers. Other important problems included: legacy IT environment with old architecture (31%), lack of sufficient knowledge and competencies (26%), and difficulties with describing performance indicators (23% - which is a result of the lack of the strategy) and problems with attracting employees (23%). Developing modern IT environments requires huge investments, as older, legacy equipment and systems prevent implementation of a uniform system for managing resources. The architecture of traditional monolithic applications often requires a lot of resources for single instances of an operating system. Replacing solutions of this type involves high financial investments and organisational efforts.

Summary

Enterprises that engage in cooperation in a networked environment see it as a possibility of creating a greater business potential and generating a greater value as part as cooperation systems. The value generated in a network should be distributed among the partners proportionally to their contributions. However, the practice shows that this is rarely the case. Thus, the issues connected with co-creation of value in a networked environment should be addressed along with the issues of effective retention of value.

Efficiency and effectiveness of the functioning of enterprises in a networked environment depends on the network architecture and the use of modern ICT solutions and tools. It is especially creation of wireless networks and provision of access to business applications from mobile devices that creates a range of possibilities of value adding and increasing security of the functioning in a network as well as improving the process of value retention.

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Attachment

SURVEY

Please, complete this survey. Its aim is to assess the importance and scope of the use of value creating factors in the operations of enterprises, with a particular focus on the role of information technologies.

The results of the survey will only be used for scientific findings and will not be used for any other purpose or shared with a third party.

1. Enterprise value is (please, put "X" next to one response):

A	The price at which an enterprise can be sold.	
B	The amount constituting the value of all the tangible assets of an enterprise determined based on the inventory.	
C	The sum of future discounted nett cash flows that an enterprise will generate in the future.	
D	It is the cost that would have to be incurred to create an enterprise identical to ours.	
E	The sum of tangible assets and intangible assets (staff, management, contacts with customers and suppliers, knowledge, experience, image, reputation, organisational culture, etc.)	

2. A source of an increase in enterprise value is (please, arrange the responses proposed below in the right order by marking the most relevant response as 1 down to the least relevant response as 6)

A	Tangible assets	
B	Customers and market outlets	
C	Intangible assets (company’s knowledge, information, image)	
D	Employees	
E	Relationships with the environment	

- | | | |
|---|--|--|
| F | The organisation and the way activities and processes are performed in an enterprise | |
|---|--|--|
3. What is the enterprise's attitude to risk (*please, put "X" next to one response*):
- | | | |
|---|---|--|
| A | The enterprise systematically estimates risk and knows its sources. | |
| B | The enterprise has an intuitive approach to risk. | |
| C | The enterprise has an institutionalised system of risk monitoring. | |
| D | The enterprise's activity is risk-free. | |
| E | The uncertainty of the environment is so huge that it is not possible to estimate risk. | |
4. The importance of a strategy in the enterprise's activity (*please, put "X" next to one response*):
- | | | |
|---|---|--|
| A | The enterprise has a formalised strategy and systematically adjusts it to the changes occurring in its environment. | |
| B | The enterprise is only focused on operational, day-to-day activities. | |
| C | Only the top management is familiar with the strategy. | |
| D | The strategy is of secondary importance in the operations of the enterprise. | |
| E | All the operational activities are in line with the strategy of the enterprise. | |
5. The organisation of the enterprise's activity is focused on (*please, arrange the responses proposed below in the right order by marking the most relevant response as 1 down to the least relevant response as 5*):
- | | | |
|---|--|--|
| A | Sourcing resources | |
| B | Satisfying customers | |
| C | Carrying out activities and processes that create customer value | |
| D | The efficient functioning of organisational units | |
| E | Implementing projects | |
6. The enterprise's investment activity mainly involves (*please, arrange the responses proposed below in the right order by marking the most relevant response as 1 down to the least relevant response as 5*):
- | | | |
|---|--|--|
| A | Increasing fixed assets and production capacity | |
| B | Training and improving staff's competencies | |
| C | Marketing and creating a corporate image on the market | |
| D | Investments in circulating capital | |
| E | Implementing innovative solutions to the way processes are performed | |
7. Indicate the factors that have the strongest impact on enterprise value (*please, arrange the responses proposed below in the right order by marking the most relevant response as 1 down to the least relevant response as 6*):
- | | | |
|---|---------------------------------------|--|
| A | Investments in tangible assets | |
| B | Investments in circulating capital | |
| C | Cost of capital | |
| D | Employees and managers | |
| E | Sales proceeds | |
| F | Processes performed in the enterprise | |
8. Indicate the factors that pose the biggest threat to an increase in enterprise value (*please, arrange the responses proposed below in the right order by marking the most relevant response as 1 down to the least relevant response as 5*):
- | | | |
|---|---|--|
| A | Competitors | |
| B | Changes in legal regulations | |
| C | Poor organisation and performance of the processes in the enterprise. | |
| D | Macroeconomic situation (inflation, unemployment, demography, symptoms of a crisis and recession) | |
| E | Lack of innovations | |
9. Investing in which areas contributes most to an increase in enterprise value (*please, arrange the responses proposed below in the right order by marking the most relevant response as 1 down to the least relevant response as 5*):
- | | | |
|---|---|--|
| A | Innovativeness, efficiency and effectiveness of the processes performed in the enterprise | |
| B | Human resources | |
| C | Relationships with customers | |
| D | Development of a network of suppliers | |

- | | | |
|---|--------------------------------------|--|
| E | Building a corporate brand and image | |
|---|--------------------------------------|--|
10. What contributes most to an increase in enterprise value (*please, arrange the responses proposed below in the right order by marking the most relevant response as 1 down to the least relevant response as 5*):
- | | | |
|---|---|--|
| A | Established goals and tasks | |
| B | Organisational structure (appropriate division of duties and privileges) | |
| C | The organisation and implementation of activities and processes in the enterprise | |
| D | Procedures and control systems | |
| E | Involvement of employees and managers | |
11. Indicate the response that best reflects the enterprise's economic and financial situation (*please, put "X" next to one response*):
- | | | |
|---|--|--|
| A | The enterprise is growing dynamically, its profitability is increasing and it is investing heavily | |
| B | The enterprise is growing moderately and maintaining financial liquidity | |
| C | The enterprise is mainly focused on survival | |
| D | The enterprise is limiting its activity | |
12. The enterprise's financial situation is determined by (*please, arrange the responses proposed below in the right order by marking the most relevant response as 1 down to the least relevant response as 5*):
- | | | |
|---|-----------------|--|
| A | Sales proceeds | |
| B | Variable costs | |
| C | Fixed costs | |
| D | Income tax | |
| E | Cost of capital | |
13. Value is created in the enterprise by (*please, arrange the responses proposed below in the right order by marking the most relevant response as 1 down to the least relevant response as 5*):
- | | | |
|---|---|--|
| A | Identifying chances | |
| B | Formulating a strategy | |
| C | Avoiding threats | |
| D | Performing value creating activities and processes | |
| E | Employees fulfilling their duties as part of the tasks assigned to the functional units in the enterprise | |
14. Which of the following ways of establishing and maintaining contacts with customers is dominant in the activity of the enterprise? (*please, put "X" next to one response*):
- | | | |
|---|--|--|
| A | Direct f2f, also using traditional forms of communication such as telephone, fax | |
| B | Through the corporate website and e-mail | |
| C | Using transaction applications e.g. CRM (customer relationship management) | |
| D | Using analytical applications designed to conduct analyses, interpret information and share knowledge: decision support systems (DSS), query and reporting systems (Q&R), data analysis and processing systems (OLAP). | |
| E | Using transformation applications, which include transaction and analytical systems, for assessing the impact of enterprise value on competitiveness | |
15. The information technology used in the enterprise (*please, put "X" next to one response*):
- | | | |
|---|--|--|
| A | Does not impact customer service | |
| B | Makes it possible to impact customers mainly by providing them with information and by advertising products/services | |
| C | Customers can respond to the enterprise's offer remotely (place orders, lodge complaints, use post-sale service) | |
| D | Allows the customer to impact the enterprise's offer, as customers can express their opinions about the most important features of products/services, read other customers' opinions | |
| E | Is crucial for adjusting products/services to the customer's actual expectations (creating customer value added), as it enables transformation of the information gathered by means of transaction and analytical applications | |

16. Resources are sourced (*please, put "X" next to one response*):

A	Only based on traditional forms of contact with suppliers (f2f, telephone, fax)	
B	Through the website and e-mail	
C	Cooperation with suppliers is through transaction applications	
D	For management of resources, analytical applications are used, such as decision support systems	
E	The use of transformation applications enables the management of the network of links with suppliers as well as the most cost-effective accumulation and coordination of assets	

17. The competences that are necessary for the enterprise (*please, put "X" next to one response*):

A	Are created as a result of vertical integration and the enterprise has exclusive rights to them	
B	Exclusivity covers intangible assets, <i>know how</i> , while tangible assets are sourced from external commercial networks	
C	Are obtained through outsourcing and purchase of whole components	
D	The enterprise establishes close contacts with suppliers and subcontractors (cooperation networks are created) to increase its flexibility and effectiveness	
E	Are coordinated at the supra organisational level and used in a way that ensures the highest economic efficiency.	

18. The human capital in the enterprise (*please, put "X" next to one response*):

A	Represents permanent employees of the enterprise	
B	The staff is often changed mainly to add external specialists to the existing group of experts	
C	Employees participate in trainings and courses on a continuous basis to raise their qualifications	
D	The enterprise cares especially about its highly qualified staff	
E	The enterprise provides intense trainings for its employees in the areas of their specialisations, mainly through e-learning, and cooperates with a broad range of specialists in its environment	

19. The development of knowledge in the enterprise takes place (*please, put "X" next to one response*):

A	Through experience built up by employees	
B	Through recruitment of new employees and hiring of external specialists	
C	Through class-room trainings for permanent employees	
D	Through purchase of <i>know-how</i> and a license	
E	Through using e-learning	

20. Provide responses to the questions in the table below (Yes or No)

Question	Yes/No
The enterprise has its website	
The enterprise accepts and executes orders in electronic form	
The enterprise sells its products/services online	
The enterprise exchanges data with suppliers and buyers in electronic form	
The enterprise uses automatic and electronic internal exchange of information	
Information technologies have a strong impact on enterprise value (its competitiveness and ability to generate long-term profits)	
Information technologies have a strong impact on the pace, effectiveness and efficiency of the processes and activities performed in the enterprise	
The implementation of information technologies is cost-intensive and lowers enterprise value	
Information technologies slow down processes performed in the enterprise and reduce their effectiveness	
Enterprise value and value increase is of key importance for the enterprise and represents its main strategic goal	

Respondents' socio-demographic data
 (put "X" next to the answer that applies to you or give the answer in words):

a)

Industry	
C Manufacturing	
F Construction	
G Trade and repair of motor vehicles	
H Transportation and storage	
I Hospitality and food	
J Information and Communication	
L Real estate activities	
N Administrative and support service activities	
Other (specify)	
.....	
.....	

b)

Enterprise category	
Micro	
Small	
Medium-sized	
Large	

c)

Character of the enterprise's activities	
Industrial company	
Services company	

d)

Ownership form	
State company	
Private company	
Cooperative enterprise	
Municipal company	
Enterprise own by employees	
Other form of ownership (specify)	
.....	

e)

Number of employees (annual average):	
Up to 9 employees	
From 10 to 49 employees	
From 50 to 249 employees	
Over 250 employees	

f)

How long the enterprise operates:	
Less than 1 year	
More than 1 year up to 5 years	

More than 5 years up to 10 years	
More than 10 years up to 15 years	
More than 15 years up to 20 years	
More than 20 years up to 25 years	
More than 25 years up to 30 years	
Over 30 years (<i>specify how long.....</i>)	

g)

Organisational and legal form:	
Sole proprietorship	
Joint-stock company	
Limited liability company	
Partnership (specify)	
.....	
Civil law partnership	
State company	
Cooperative	
Association	
Found	
Other (specify)	
.....	

h)

Origin of the enterprise's capital	
Foreign capital 100%	
Dominant share of foreign capital	
Polish capital 100%	
Dominant share of Polish capital	

i)

Name of the enterprise	
.....	
.....	
Location (voivodeship, powiat)	
.....	
.....	
Function of the responder	
.....	

Kod JEL: L21

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