

INNOVATIVE AND INFORMATION PERSPECTIVES OF BUSINESS MANAGEMENT

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Abstract: The purpose of this study is to point out the extent to which enterprises want to exploit the possibilities of information technologies (IT), system integration of information systems (IS) and business process automation with the aim to increase the intelligent work with information and improve business management support in enterprises. The paper evaluates the development and analyzes the views of 189 managers of Slovak SMEs and 26 managers of IT companies on the causes that prevent wider use of innovation opportunities and IS potential in enterprises in the process of increasing the competitiveness of their enterprises in the market. In this case we focused on the analysis and identification of several advantages and disadvantages related to the implementation of innovation and process automation and their impact on business management. We compare these results with the results of similar researches in the EU. Based on the best practice results, we suggest practices and recommendations that should eliminate the barriers to successful implementation of innovation potential in businesses and create conditions to support managerial decision making processes to be more effective.

Key words: Innovation, ICT, Business process automation, Management development techniques, Business models

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Introduction

Successful business performance is strongly dependent on managers' possibilities to obtain the most available information, expertise, knowledge and wisdom by using all information systems' possibilities and tools supported by IT. All required data exist, but manual processes to search, extract, summarize and report on an ongoing basis are too time consuming and expensive. This is often caused by incorrect structure of available information or insufficient analysis.

According to our previous research (realized in 2015 with managers of SMEs), the level of information usage obtained within using such tools as marketing information systems, business intelligence, competitive intelligence strongly effects business growth, particularly in the sector of micro-enterprises (strong dependency). Although Slovak enterprises own above mentioned information systems supported by the newest information technologies, they usually do not use

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all their possibilities. Managers usually make analyses of markets, competitors, partners and technologies, but they use only basic available tools. It is common to use only MS Excel (scenario planning, simulation/modelling, e.g.) for processing information despite of the fact they own better tools. It is almost due to lack of knowledge and lack of finance. One possibility how to succeed is to get control over the processes by using their innovations and automation of business processes (BPA). In this way a company can improve the control of performed processes and achieve improvement of knowing about their activities. This information base will allow managers to increase quality of management and decision making. Innovation as a change makes companies to put higher stress on effective utilization of available software equipment and its intelligent application applications not only for information support but also for increasing the overall company performance.

Basic Assumptions for Innovation of Business Management

The IT industry is one of the most robust industries in the world as it, more than any other industry or economic facet, has an increased productivity, particularly in the developed world, and therefore is a key driver of global economic growth (Abu Rub and Issa, 2012). It rapidly increased the growth and improvement of ICT. Each enterprise (regardless its size or turnover) may dispose with the newest technologies and use their opportunities. Processes of globalization have been taking its place, which was reflected by the development of IT that conditioned the changes in the processes of business organization and in the conception of traditional business models. It increases electronic ways of obtaining, analyzing, processing and distributing information. Information is essential in every business – about internal environment as well as external environment in micro and macro view. There is no problem to obtain information, to work with it, analyze it and to make decisions as long as an enterprise has a few customers or suppliers and its competition on a target market is small. It increases the need to orientate in data about enterprise environment and its surroundings. It can be a problem if it is not organized reasonably. As we have found from the results of our previous research, it is usually the case that some information is obtained and processed duplicate on several places and another is missing in an enterprise. It means there is no problem with lack of information, but with its surplus, relevancy and verity (Pomffyová and Bartková, 2016). Both content and form of information are important. This is almost the reason for refusal to cooperate with the new partners or to entry to new market. If cooperating enterprises do not dispose with the right system for obtaining, processing, sharing and using of information, employees and managers will be lost in information and will not know how to make a decision (Peyrot, et al., 2002, Biere, 2003, Fitriana et al., 2011, Abbott, 2014). Prosperous conditions for electronic business development have been formed due to intensive processes of globalization and increasing extents of competition (Jovarauskiene and Pilinkiene, 2009). It is common to have it not only in big companies but also in SMEs. On the

market - complex information systems as modular applications that are not designed just for large companies but also for small organizations are available.

As Bankole and Bankole (2017) state, ICT innovation is one of the major forces for socioeconomic development. It is the key element to spur growth of the economy of a nation. When entrepreneurs innovate, this consequently contributes to higher levels of international competitiveness (Ferreira et. al., 2017). As Lopes et al. (2017) also state, innovation plays a key role towards effective strategic sustainable management. Hall and Sena (2017) find that firms that innovate and rate formal methods for the protection of intellectual property highly are more productive than other. As we have researched, in practice, there is occurred the problem related to a lack of systems integration of IS. We decided to research the key barriers that slow ICT using as well as the assumptions for system integration of IS.

The European Commission has identified three factors that make it difficult for SMEs, in particular, to engage more fully with ICT and develop sustainable business practices (Gatautis and Vitkauskaite, 2009). Firstly, the relatively high costs associated with investments in ICT, secondly, the lack of technical and managerial skills, and thirdly, reluctance on the part of SMEs to network with other enterprises. As Wu (2017) states, enterprises should build a well technological innovation system, increase the technology innovation input and be active in technological innovation activities. We can follow the approaches how to be more successful than competition. It lies in an inter-functional coordination that was firstly defined at the beginning of 90s (Kanovska and Tomaskova, 2012). It is the coordination of all enterprise activities leading to the increase of business performance. Hi-tech firms perceive inter-functional coordination as very necessary presumption for enterprise future development and prosperity.

Innovation as a Driver for Change

The method of creating innovation means to discover, create and develop ideas, to refine them into useful forms, and to use them to make profits, increase efficiency, and/or reduce costs (Závodský et al., 2012). It enables companies to achieve results that are compatible with corporate strategy (Dallavalle de Pádua et al., 2014). By Pansera and Martinez (2017) innovation underpins a purpose, a goal that is not just novelty for the sake of novelty. One of the possibilities how to innovate is using business process automation. Very important task in this case is to determine which processes will be automated in view to achieve the desired increased efficiency. According to Kabaale and Kituyi (2015), the current inefficient operating processes are used as a way of change. Companies can decide to automate the main or support processes, the business processes. All of such processes are suitable candidates for automation.

Business Process Automation and Management Improvement

Particularly, business process automation is replacing manual and frequently recurring activities with appropriate software support. It regards the use of ICT to promote performance and business process management. The main result is to achieve synchronization and coordination of business processes. Business processes will thus be able to control, measure, evaluate, optimize with minimal involvement of employees. So, the enterprises will be provided not only with adequate information about the progress and duration of activities, it may dispose with accurate information related to controlled processes and their response. It allows them better implementation of managerial and decision making processes.

As Tuček et al. (2013) state, Business Process Management (BPM) serves as the comprehensive process management. The goal is to set the process in order to achieve the maximum efficiency. Traditional approaches to BPM generally follow this sequential order: a business strategy is proposed; the business structures and processes are planned; and, business structures and processes are implemented with the support information technology (Kabaale and Kituyi, 2015). According to Pradabwong et al. (2015), this process-oriented approach is used to design, analyze and improve business processes to enable it to effectively manage and improve performance. Le Loarne and Blanco (2009) claim that it is increasingly used not only in large, but in recent years also in small and medium-sized enterprises with the aim to create successful and effective functioning of innovation processes.

IT has the highest possible impact on IT-driven BPR methodologies (Panayiotou et al., 2015). New technologies open new possibilities of individually shared information and new kinds of interaction among employees (Bögel et al., 2013). Hänel and Felden (2015) state, that the integration leads to higher efficiency and improves business processes. As Samaranaake (2009) states, the choice of a particular software application itself affects the performance of business processes. Their usage also allows the enterprise to use vast amounts of data to obtain valuable information about business processes (Suriadi et al., 2015). In addition, these systems help create an integrated and functional whole in terms of IT business support. We reviewed the situation in presented areas of innovation based on views of managers of SMEs as well as IT managers.

Methodology and Data

As the basis for the summary of the conclusions, we will use the results of our research, realized in 2015-2016, which is a part of the research aimed at utilization of Competitive Intelligence and Business Intelligence in Slovak companies as well as findings from other surveys in this area. The object of our research are the opinions of respondents concerning the barriers that restrain the widespread use of IT, system integration of IS and tools supporting business process automation as a tool to promote awareness of their immediate status, in order to improve the support for governance and decision-making.

We will consider our assumptions as well as comments and views obtained by summarizing the arguments of respondents - company managers and representatives of IT companies. We used questionnaire distributed electronically as well as personally, and on-line structured interview method. Our questionnaire research sample consists of 189 respondents from Slovak SMEs on positions of middle and upper managers or owners and partners. Using the identification questions we analyze structure of the research sample according to the size of enterprises and their average annual turnover (112 micro, 40 small and 36 medium enterprises), area of doing business (44% in area of wholesale and retail, 27% in food and textile and furniture industry, 12% in metal and engineering industry, 8% in building industry, 5% in banking, healthcare and agriculture sectors, 3% in transportation, and 5% in various types of industry), as well as what type of software do they use to working with information.

We also researched the opinions of 26 providers of software support for business process automation (69%) and those, which only focus on providing system integration of information systems (31%). We also identified positives and negatives related to business process automation and its influence on business management. From all the surveyed respondents there were most micro companies (48%), small businesses (37%) and the smallest representation consisted of medium-sized companies (15%).

To evaluate barriers as well as obstacles, which prevent better utilization of technologies and innovations, potential we set our partial hypotheses.

H1: Most of SMEs use only basic type of software to working with information as heterogeneous solutions.

H2: SMEs that stated that "During the last five years their turnover mostly increased or stagnated", use IS in these order: first company IS, then office IS, system supporting processes management and its outputs, and finally these that do not use any IS for working with information.

H3: If companies are interested in new technologies and innovations, they will be more frequently interested in new information about them.

H4: If enterprises do not prefer to seek and analyze information about software, IT and innovations, the reason are: "I do not consider it to be effective" or it is "too time consuming", is mostly frequently occurred answers, than "required information is not available" and "special skills are needed".

Next, we examine the validity of these hypotheses using the methods of regression analysis. We used the statistical software, named SPSS. We used built-in method as the Friedman test as well as Mann-Whitney U test. To assess levels as well as orders of respondent's preferences we used also the descriptive and frequency statistics, comparative and summarizing methods - synthesis, as well as the thought processes - induction and deduction.

Results

According to Mueller et al. (2009) in most companies the basis of used computer software is very heterogeneous and this causes a need for data integration. This is especially difficult for small and medium-sized enterprises, as they face the problem of relatively high costs concerning the existing standard solutions spread only on a small scale. In this context, we have defined and verify our first hypothesis. We examined respondents' views (189 managers of SMEs) to the question "What software they almost use to process information in their company?" We also evaluated the orders of the respondents' preferences concerning the use software support to process information in their company, using a non-parametrical Friedman test.

As we found, in micro and small enterprises the most frequently used software is office information system (52.4% of respondents, with mean rank position equal to 3.3). The second mostly used software is "company IS" (31.7% of respondents, with mean rank position equal to 2.63). Such software is usually used as common software for data processing in medium and then in small enterprises. Only a small part of all SMEs used system supporting processes management and its outputs (9.5%, with mean rank 2.05). We also found out that in micro sector it is common that they do not use any information systems to process information in their company (6.3%, where the value of mean rank was 2.02). Our hypothesis H1 was confirmed.

We tried to assume our hypothesis H2. SMEs which stated that "During the last five years their turnover mostly increased or stagnated", use IS in these order: first company IS, then office IS, system supporting processes management and its outputs, and finally these which do not use any IS for working with information.

We examine relationships between turnover increasing or stagnating and between decreasing and fluctuated and between using of some type of IS or Company IS or system supporting processes management. We found that in our sample was 74.3% of SME whose turnover is increasing or stagnating and 25.7% of SME which state that their turnover is decreasing or fluctuated. Most of SMEs (48%) with increasing or stagnating growth state, that they use only office information system for working with information, 12% of them use company IS, only 5% use system supporting processes management, and 10% of them do not use any IS. We have to conclude, that our hypothesis is not confirmed. There is different order of IS as we assumed. Most of SMEs use only for information processing only basic information systems and even so their turnover is growing. There are also companies that are successful and do not use any information system. They are micro enterprises, where their average annual turnover is smaller than 2 million. EUR and the area of doing business are food industry, accommodation and food services.

Next we tried to verify our third hypothesis H3. According to our previous research (realized in 2015 with managers of SMEs), only a small part of SME was interested in the new technologies. We tried to find the key barriers, which prevent companies to utilize the potential of new technologies and innovations. Wasinski

and Wozniak dealt with a similar issue and (2016) they stated that managers of small and medium-sized enterprises declare lack of financial resources and infrastructure for the comprehensive implementation of integrated information systems to facilitate interpersonal communication in plants. They use only traditional tools, their level of skills is low and their awareness of staff production facilities in the field of information security, especially when working on the computer and using traditional media is low, too. These results are part of the research which was done in 50 small and medium-sized enterprises located in Lower Silesia. We decided to research the common situation in this area also in the sector of Slovak SMEs. To review adequate amount of information we analyzed respondents' answers to the question if companies have enough information about the technologies and innovations. The result is that in two above mentioned areas companies see low level of satisfaction with the rate of their awareness (the worst was situation concerning foreign markets awareness). Using Wilcoxon Signed Ranks non-parametrical test we considered mutual relation between awareness of new technologies and innovations. As we found, $\alpha = 0.127 > 0.05$, therefore, we want to state, that they feel to be better informed about technologies than about innovations. Then we reviewed frequency of seeking information about technologies and innovations. We considered respondents' answers to question "How often do you search information about technologies or innovations?" We tried find out if they more often seek information daily, weekly or monthly or prefer seeking information once a half year, once a year or never. By Wilcoxon Signed Ranks Test we considered the frequency of seeking information. We calculated, that $\alpha = 0.827 > 0.05$. We found out that they are mostly seeking information about innovation or technologies (app. monthly, 29% or half yearly, 20.5%). That is why we can state that, if companies are interested in new technologies and innovations, they will be more frequently interested in new information about them. Our hypothesis was confirmed.

Next, we examined hypothesis H4. Firstly, we examined "What is the reason for lack of information about these areas?" Using Friedman's non-parametrical test we found out that respondents assume that it is not effective for them (mean rank=2.74), next it is too expensive for them (mean rank=2.53). As following, there are: "they do not have enough information about searching methods" (mean rank=2.45) and a part of them uses opportunities of external company (outsourcing) (mean rank=2.28). Secondly, we researched the situation: "Why enterprises do not prefer to analyze information about innovations or technologies?" If they make such analyses, they prefer almost financial analyses (app., in 28% cases). To set the order of preferences, we used Friedman test.

We found out, that the situation is different as the above-mentioned one. We found out, that the barriers are: it is too expensive (4.72), required information is not available (4.70), special skills are needed (4.53) and it is too time consuming (4.43) and respondents do not consider it to be effective (4.36) or special software is needed (4.25). As we can see, the barriers are not the same. Enterprises mostly

consider that it is not effective, or it is too expensive for them to seek such information. The situation is different in the case of barriers why enterprises do not prefer to analyze such kind of information: as the biggest barriers are: “it is too expensive”, “required information is not available” or “special skills are needed”. Therefore, H4 was not confirmed.

We also researched how often they use outsourcing to make analysis about technologies and innovations. In this case, $\alpha = 0.180 > 0.05$, and it means that disinterest in both outsourcing of technologies and innovations prevails. Better situation is in the area of interest in utilization of a special program to automatize processes (app. 31% uses it monthly, but 60% do not use it at all). It means that only enterprises where positive enterprise attitude for innovation, preference for systems that support teamwork, mutual cooperation of all the managed processes and also effort to be flexible exist, can succeed in hard competition. A similar idea is expressed by Brink (2016) who claim that governance of behaviour of SMEs has a considerable significant positive impact on innovation, which subsequently has a significant impact on their management level, and consequently their growth.

Next, we examined opinions of 26 representatives of IT companies and suppliers of such solutions and discussed the barriers of widespread using of system integration of IS and business process automation (using structured interview). The possible causes of barriers to use IT, to integrate and innovate common IS as well as attitude to innovate enterprise processes were discussed. Due to the interviews with these representatives and on the basis of best practices, we found that it is necessary to keep: right estimate of the time necessary to implement (30%), sufficient analysis and knowledge of the system (26%), right estimate of human resources (18%). It follows: under-estimated resources (financial, material, etc.) - (15%) and it is necessary to take into account that the conditions and requirements of customers change rapidly (11%), well defined and structured processes, extensive editorial support for applications during process testing, and incomplete idea of the real needs of the customer.

Analysis of actual state of utilized ICT in selected companies was aimed also at determination of influence on business management. In this regard, one of the researched areas was to identify a number of advantages and disadvantages connected with implementation of processes automation. Positives related to business process automation and its influence on business management are: simplification of manual and often repeated task execution, shortening of process duration time, simpler monitoring and control of processes, simplification of process management, decreasing of costs to human resources and energy, flexible modification and adjusting to changing conditions, effective utilization of resources, higher quality of communication, simple and quick administration, setting of periods for duties fulfilment, setting of unique approval procedures. Negatives are: investment in software support, unwillingness to accept changes on the of employees, costs to retraining of employees, necessity of qualified workforce, re-allocation of employees, necessity to spend time to seek IT

companies, taking risk of internal information leak. These prerequisites will allow us to create much more sophisticated conditions for managerial decision-making.

Conclusions

In this paper we examined the barriers that restrain the widespread use of IT, system integration of IS and tools supporting business process automation based on the arguments of respondents – company managers and representatives of IT companies. We evaluated our hypotheses aimed to receive or decline our assumptions in the area of the exploitation the potential of IT, especially in the SMEs. Hypotheses are partially confirmed. We can state, most of SMEs (93.7%) use basic software support for business doing. This creates conditions that increase the importance of implementing electronic business models also in the small and medium sector as a basic tool for data processing, information searching and for their distribution and sharing. This is important when it takes a quick decision in the environment in strong competition.

Before software implementation for business support, it is necessary to acquire adequate information about the company. According to the views of literature findings, respondents' and interview representatives' views, we can classify this information in the following order: finding functionality in order to use software support, the level of integration with other instruments, identifying areas of corporate activities, and the price they are willing to invest in the ICT support, technical requirements, existing IT support and the other requirements included - bottlenecks in business processes, knowledge of work practices, current processes and planned changes, process model, as well as the application to be supported.

Enterprises, that will be well informed about new technologies and complex solutions of IS and BPM can succeed in hard competition. Enterprises, in which these problems are properly examined, can create a positive enterprise attitude for innovation, preference for teamwork, co-operation and effort to be flexible.

The innovative need lead to the integration of an environment for the support of knowledge management based on the creation of conditions for the establishment of an environment for the dissemination of knowledge across the enterprise. In this sector, SMEs are the initiators of change, so they have to look for suitable solutions at low cost to innovation and BPM.

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INNOWACYJNE I INFORMACYJNE PERSPEKTYWY ZARZĄDZANIA PRZEDSIĘBIORSTWEM

Streszczenie: Celem niniejszego artykułu jest wskazanie, w jakim stopniu przedsiębiorstwa chcą wykorzystać możliwości technologii informacyjnych (IT), systemowej integracji systemów informatycznych (IS) i automatyzacji procesów biznesowych w celu zwiększenia inteligentnej pracy z informacjami oraz poprawy wsparcia zarządzania w przedsiębiorstwach. Artykuł ocenia rozwój i analizuje opinie 189 menedżerów słowackich MŚP i 26 menedżerów firm IT na temat przyczyn, które uniemożliwiają szersze wykorzystanie możliwości innowacyjnych i potencjału systemów informatycznych w przedsiębiorstwach w procesie zwiększania konkurencyjności na rynku. W tym przypadku skupiono się na analizie i identyfikacji szeregu zalet i wad związanych z wdrażaniem innowacji i automatyzacji procesów oraz ich wpływem na zarządzanie przedsiębiorstwem. Porównano osiągnięte wyniki z rezultatami podobnych badań w UE. W oparciu o wyniki najlepszych praktyk zaproponowano rozwiązania i zalecenia, które powinny wyeliminować bariery utrudniające skuteczne wdrażanie potencjału innowacyjnego w przedsiębiorstwach i

stworzyć warunki do wspierania procesów decyzyjnych menedżerów, tak aby były bardziej skuteczne.

Słowa kluczowe: innowacje, ICT, automatyzacja procesów biznesowych, techniki rozwoju zarządzania, modele biznesowe.

創新和信息視角的企業管理

摘要: 本研究的目的是指出企業要在多大程度上利用信息技術(IT), 信息系統(IS)的系統集成和業務流程自動化的可能性, 以增加信息的智能化工作並提高企業對企業的管理支持。本文對斯里蘭卡中小企業189名管理人員和26名信息技術企業管理人員的發展進行了評估, 分析了企業在提高企業競爭力的過程中阻礙更廣泛地利用創新機會和企業潛力的原因。在這種情況下, 我們著重分析和識別與創新和過程自動化的實施及其對企業管理的影響有關的幾個優點和缺點。我們將這些結果與歐盟類似研究的結果進行比較。根據最佳實踐結果, 我們提出了一些實踐和建議, 以消除企業成功實施創新潛力的障礙, 並創造條件支持管理決策過程更加有效。

關鍵詞: 創新, ICT, 業務流程自動化, 管理開發技術, 商業模式