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DIGITALIZATION OF BUSINESS PROCESSES OF SMALL AND MEDIUM ENTERPRISES

This research addresses the opportunities and challenges related to the adoption and use of digitalization in micro, small and medium enterprises (SMEs), the results so far, and how SMEs can be helped to start and improve their «go digital» businesses. The analysis in the first part includes business process models and digitalization of business as the main trend of the modern economy. Digitalization is then considered globally from different aspects. The analysis was performed from three aspects, the aspect of knowledge management, the aspect of innovation, and the aspect of business process management. The final part of the paper presents the results of the analysis of the degree of digitalization of SMEs in Russia, Slovakia and Serbia performed using the IDSME index on a sample of 226 companies. The conclusions recommend that everything that can be automated be automated so that workers can engage in creative work and that SMEs perform self-evaluation using the IDSME index so that they can realistically see their potentials, strengths, and weaknesses.

Keywords: SME, digitalization, knowledge management, process management, innovations, IDSME index

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ЦИФРОВИЗАЦИЯ БИЗНЕС-ПРОЦЕССОВ МАЛЫХ И СРЕДНИХ ПРЕДПРИЯТИЙ

В данной статье рассматриваются возможности и проблемы, связанные с внедрением и использованием цифровизации в деятельности микро-, малых и средних предприятий (МСП), полученные на данный момент результаты и способы, с помощью которых им можно помочь начать и улучшить свой «цифровой» бизнес. Анализ в первой части включает в себя модели бизнес-процессов и цифровизацию бизнеса, как основной тренд современной экономики. Далее в статье цифровизация рассматривается глобально с разных сторон. Анализ включает в себя аспект управления знаниями, аспект инноваций и аспект управления бизнес-процессами. В заключительной части статьи представлены результаты анализа степени цифровизации МСП в России, Словакии и Сербии, выполненного с помощью индекса IDSME на выборке из 226 компаний. В выводах рекомендуется автоматизировать максимальное количество операций, которые могут быть автоматизированы, чтобы работники могли заниматься творческой работой, а МСП проводили самооценку с использованием индекса IDSME, чтобы они могли реально увидеть свой потенциал, сильные и слабые стороны.

Ключевые слова: МСП, цифровизация, управление знаниями, управление процессами, инновации, IDSME индекс

A literature review shows that no generally accepted definition of the *business process* exists. That makes it hard to define the term *business process model* because it is not possible to determine the subject of the modeling. Different definitions include different terms used in business process

descriptions: *relationship, structure, client, transaction, activity, task, process step, work step, purpose, subject, product, and service...* [1].

In essence, one can distinguish two basic interpretations of the term business process. The first considers business processes as kernel processes that define company services and produce value for the customer [2]. The second definition is broader and defines business process as a process that contributes to a company's performance, including service and support processes.

Many scientific and professional papers discussed the advantages digitalization brings to small and medium enterprises (SMEs), e.g. [3–6]. It is interesting to note that according to a survey conducted by the SAP¹, 46 % of decision-makers believe that digitalization provides the same opportunities to all companies, and 37 % of them believe that SMEs have an advantage over large companies due to their flexibility [1].

Digitalization of business processes brings many innovations in corporate governance. It enables much more transparent control over the employees' work but at the same time provides them with more comprehensive support in their work. Some authors question whether workers turn into tools that depend on the platforms that «employ» them. The paper [8, p. 30–32] gives as examples:

- *Intelligent factory Bosch Rexroth* where the assembling executes according to the «Just-in-Time» system. Products are transferred and sorted with the help of artificial intelligence that informs the worker about what to do;

- *Technicians who maintain Kone elevators*. They carry computers that allow them access to technical and other data they can use in their work. At the same time, it allows management to monitor their activities both when they work and during transportation from one workplace to another;

- *Amazon's order fulfillment algorithms*.

In the case of Amazon's algorithms, Irani [2] states that they create a work scenario and orders that dictate how the workers work in warehouses. A worker can either accomplish a task or leave. Although Irani cites this as a new problem that threatens workers' livelihood, it is practically no different from the well-known work on the conveyor belt. The only difference is that here software defines the work-dynamic, and in the case of conveyor belts, the engineer in charge determines the speed.

Bearing in mind digitalization, Head [3] rightly asks a question that can be paraphrased as «Will smart factories produce stupider workers?» In the same paper, he answers that this could happen if unions and workers do not choose technology to be a tool for workers and not the other way around.

1. ASPECTS OF DIGITALIZATION.

1.1. Digitalization of business processes from the aspect of knowledge management. Business process modeling is very often reduced to a description of activities and their relationships, which is suitable for describing the current situation, but of little use when it comes to innovation [11]. Process orientation in creating a business model is focused primarily on increasing the effectiveness and efficiency of the production process. Innovation means thinking about new yet not realized options and without details. The introduction of knowledge management added another element, knowledge transfer. Knowledge transfer is not only about presenting knowledge but also about creating knowledge from the collected information. Dominant, mapping-oriented understanding of the terms *knowledge* and *model* in both disciplines does not consider their inclusion in social practice. Therefore, one must consider alternatives to this understanding [1].

The perception of knowledge management as a specific function of management by which knowledge is considered a resource appeared in the last decade of the twentieth century. The application of information technology accelerated it. However, although the topic is often discussed,

¹ SAP SE (Systeme, Anwendungen und Produkte in der Datenverarbeitung) is a German multinational software corporation based in Walldorf, Baden-Württemberg that develops enterprise software to manage business operations and customer relations.

there are still different approaches to what knowledge is, and what knowledge management is about. Sveiby [12] proposed one of the classifications. He viewed knowledge management from two perspectives with two levels and presented his point of view in a table (Table 1). He means by knowledge management: «The art of creating value from intangible assets».

Table 1

Knowledge management		
Track Level	IT-Track Knowledge = Object	People-Track Knowledge = Process
Organization level	Re-engineers	Organization theorists
Individual level	AI – specialists E – specialists	Psychologists

Source: author's developed on the basis of [12].

From an IT perspective, knowledge management is information management. Consequently, knowledge is an object. From the human resources management perspective, the management goals are to evaluate, change and improve human skills and influence their behavior, so knowledge means the process as a set of dynamic skills and *know-how*. When researching knowledge management, the question necessarily arises: Knowledge management or management of those who know? There is no unequivocal approach here either. Some cultures focus on explicit knowledge and measuring and managing existing knowledge and view the organization as an information-processing machine. In this regard, employers consider their employees as part of an information system for data processing, and not as a system for generating information and creating new knowledge. This second approach is much more complex and fruitful. Ignoring the subjective aspects and the social context leads to the wrong conclusion regarding their integration.

1.2. Digitalization of business processes from the aspect of innovation. Oslo Manual 2018 distinguishes between innovation as an outcome and the activities that drive innovation. It defines innovation as «a new or improved product or process (or a combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)» [13]. That is a general definition. It refers to everything that brings innovation, from individuals to state institutions, including SMEs. In the case of SMEs, four significant concepts can be singled out [13]:

- *innovation activities* – include all development, financial and commercial activities that the company undertakes to achieve some innovation;
- *business innovation* – is a new or improved product or business process (or a combination thereof). it differs significantly from what the firm previously had and offered to the market or used within the firm;
- *innovative product*;
- *innovative business process* – a new or improved business process for one or more business functions.

Digitalization requires the application of digital technologies in most existing activities and opens new activities. When digitalizing its business processes, the SME should first identify the category of its business process. Then it must determine whether the innovation it wants to introduce is an innovation only for that SME, or for its market, or globally, whether it will bring changes to the market covered by the SME, and whether innovation will increase its competitiveness. Not every change is innovation. Thus, e.g., routine changes, transfer of ownership or expansion, aesthetic product changes, production according to the wishes of one customer, conceptual or model solution, or prototype

production are not in themselves innovations. For something to be an innovation, it needs to enter the market.

SMEs can be innovative and innovatively active in a certain period, and the situations shown in Table 2 may occur.

Table 2

Innovative and innovation-active firms

		The SME has innovation activities in the observation period	
		Yes	No
The SME has at least one innovation in the observed period	Yes	The SME has one or more innovations and is, therefore, an innovative firm. Innovation activities can be ongoing, put on hold, completed, or abandoned	It might occur if all work to introduce an innovation was conducted before the observation period
	No	The SME is innovation-active but has not introduced an innovation, although it might do so in the future	The firm is not engaged in innovation activities and has not introduced any innovations in the observation period

Source: author's developed on the basis of [14].

In connection with innovation activities, applying digitalization SMEs can plan and implement many activities (marketing, research and development, training, etc.) that can lead it to the goal, to achieve positive results. The use of digital technologies enables faster, easier, and cheaper goal achievement.

When creating a new product, an SME should keep in mind intellectual property, either to protect its innovations, or to use someone else's intellectual property, e.g., patents, licenses, and the like.

Every innovation comes with costs. The innovation project implementation digitalization enables monitoring of up-to-date data on invested funds, also easier adjustment of plans and/or costs, and easier forecasting of total costs, ie. considering the cost-effectiveness of innovation. That is especially true in cases where more complex projects involve multiple parts of SMEs and when it is hard to keep track of each cost. Digitalization is extremely useful here. It can enable SME to better measure its intellectual capabilities, competencies, financial, production and other resources, internal and external factors, and to decide based on such an analysis on starting or not starting work on a specific innovation. Unfortunately, many SMEs do not perform such an analysis, so many projects remain started and unfinished. It may lead SMEs to bankruptcy.

A special group of innovations consists of *digitally based innovations*. It includes ICT product and/or process innovation and ICT-based innovation. Nowadays, there are more and more such innovations. The SME must assess the factors crucial for this area, such as digital integration of SME in their business activities; access to relevant data and analyzes and the ability to use that approach; possession of appropriate manpower, equipment, Internet access, and Internet platforms; selection of the most favorable business model in the Internet environment; managing sensitive and private customer data, and, most importantly, the degree of vulnerability to cyber-attacks.

1.3. Digitalization of business processes from the aspect of business process management.

Business process management refers to a set of methods, techniques, and systems used to improve an organization's business processes. Improvement implies all activities that lead to improving the organization's business processes. It includes key-factors identification, setting of priorities, analysis, definition, and implementation of selected solutions, as well as monitoring the effects of applied solutions. Constant improvements are necessary, so the process is repeated continuously. Business process management is expected to increase the flexibility and agility of the organization, but also to

align the organization with innovation and be customer-oriented. Given the complexity of tasks, business process management is demanding in every way. It affects different organizational levels and resources of the organization. Approaches to management have changed over time, and one of the newer ones, SME-oriented, is presented in the paper [14]. The paper is based on the process and business maturity model (PEMM) proposed by Hammer in his paper [15]. The PEMM framework essentially supports all companies in planning and implementing transformation-based processes. In addition to individual processes, transformation-based processes include five characteristics: design, executor, owner, infrastructure, and metrics.

At present, the prevailing view is that improving the business performance of an SME can be achieved by constantly installing new technological solutions in business, which primarily refers to social media, mobile technologies, and through the constant digitalization of their own business. If one can say that technology is a key factor in process management, then technology is a central element of digitalization. Without its application, there is no transformation.

2. EVALUATION OF THE LEVEL OF DIGITALIZATION OF SMEs.

Scientists developed a lot of coefficients to assess the level of digitalization of a company and compare it with others at the state level. They covered many factors ranging from the possibility of Internet access to public digital services. A summary of these indexes (DESI, I-DESI, IDI, etc.) is given in [3]. However, all these analyzes include analyzes of historical data, which means obtaining results related to the work in the previous period. One of the indexes, which enables the assessment of the degree of digitalization of SMEs in real-time is the IDSME index. It is described in detail in [4], and here we will only point out that the IDSME index has four dimensions.

1. Connection to the Internet.
2. Digital skills.
3. Integration of digital technologies, and
4. Internet usage.

These dimensions are weighted depending on their significance. Each of the dimensions has its sub-dimensions, and indicators. In total, the IDSME index includes 28 criteria.

The IDSME index intends to the self-evaluation of SMEs. It allows them to identify their strengths and weaknesses and develop plans that will improve their business. Using the IDSME index, they will be able to see their position and improve what can be improved. IDSME is particularly suitable for comparing SMEs within a group of SMEs that deal with the same or similar activity, as the analysis will include the same indicators, and the results will be more comparable [4].

As an example of the results obtained by surveying 226 SMEs in Serbia, Slovakia, and Russia, the mean values of the IDSME index by countries and collectively, shown in Table 3, can serve.

Table 3

Mean values of IDSME indexes by countries and collectively

Companies	IDSME for the surveyed SMEs			
	Russian Federation	The Republic of Slovakia	Republic of Serbia	Responded SMEs collectively
Medium	0.453	0.464	0.511	0.503
Small	0.530	0.423	0.520	0.519
Micro	0.451	0.420	0.398	0.429
SMEs in total	0.460	0.444	0.465	0.483

Source: author's developed.

By analyzing their data according to the proposed criteria, SMEs can see their position in the environment and improve where they lag others. The main advantage of using the IDSME index is that it can analyze the current state of the degree of digitalization of the interested SME.

Conclusions. Based on the performed analysis, it is possible to conclude that digitalization is necessary for the functioning of SMEs. Digitalization of business processes has the greatest potential, but it also brings many innovations in company management. It enables much clearer control of the work of employees, but also provides them with better support in their work. Everything that can be automated should be automated to enable employees to engage in creative work. It would be bad if, due to automation, workers turn into tools that will depend on the platforms that «employ» them.

Digitalization of business processes is a complex task that needs to be solved by having in mind the most diverse aspects that can be opposed to each other. The outcome largely depends on the quality of previous analyzes. For an SME, it is profitable to identify its opportunities using some of the self-evaluation models, e.g.

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