

Business process redesign as a basic aspect of digital business transformation

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Abstract

Background: It is widely accepted that the digital transformation of business is increasingly attracting the attention of researchers from the academic circles as well as professionals from the business community. The main consequence of this lies in the daily development of new and improvement of existing digital technologies. The outcomes of such events on the market are reflected in all aspects of companies' operations. For this reason, they are constantly looking for various improvements to their business, which most often include the implementation of new technology. Mere implementation of a new technology without any other changes very often leads to failure. The core of this failure can be found and attributed to inadequately identified, analysed, documented and established business processes. Business process management (BPM) and redesign as its integral part are actually an indispensable segment of a successful process of digital business transformation. Therefore, the digital transformation of business should not be viewed exclusively from a technological perspective, but also from a process viewpoint.

Purpose: With the aim of shedding additional light on the connection between business process management and digital business transformation, the paper aims to identify and explain the importance of business process redesign.

Study design/methodology/approach: For the purposes of this paper, a systematic literature review was conducted.

Findings/conclusions: The result of the conducted research indicates that a process approach to the digital transformation of business can contribute to significantly different, more successful results.

Limitations/future research: Limitations refer to the number of databases searched during this systematic literature review. Subsequent research could include additional sources that would include additional works that can contribute to a better research result.

Keywords

digital transformation; digital technologies; business process management; BPM; business process

Introduction

The fourth industrial revolution or Industry 4.0 can be characterized as the era of digitization and information (Kostakis & Kargas, 2021). It was very quickly realized that the initial goals of Industry 4.0 would be exceeded and that its impact would be reflected on all companies and society as a whole. Entering the fourth industrial revolution

marked the need for companies to change their strategies and practices in order to cope with the information storm and rapid changes in the market, in order to achieve competitive advantage and survival (Kostakis & Kargas, 2021). Guided by recognized potentials, stated changes, needs and intentions as well as the goal to evolve towards the digital age, companies are starting their own transformation known as digital transformation

with the aim of achieving competitive advantage and emphasizing diversity (Fernández-Rovira & Álvarez Valdés, 2021; Skhiri & Duverne, 2020). Digital business transformation is becoming the goal of every company (Karekla et al., 2021). Li, (2020) describes digital transformation as a modern way of overcoming obstacles caused by digital changes. Although studies on digital transformation have existed for about 10 years, only in recent years have they aroused greater scientific interest (Ivančić et al., 2019). Regardless of the fact that they represent a more recent concept, Graphs 1 and 2 testify to the interest of scientists in the analysis of this topic. A search of the index databases "Scopus" and "Web of Science" by entering the keywords "Digital transformation" resulted in a total of 19,121 hits that contain a defined keyword in the title or abstract. The decline that can be observed for the year 2022 on both graphs can be attributed to the fact that at the time of writing this paper, not even half of the year 2022 had passed. Observing the trend of the number of works in previous years, it is expected that the number of published works will continue to grow this year compared to the previous one. Both graphs point to 2016 as the year of the start of a significant increase in interest in the topic of digital transformation.

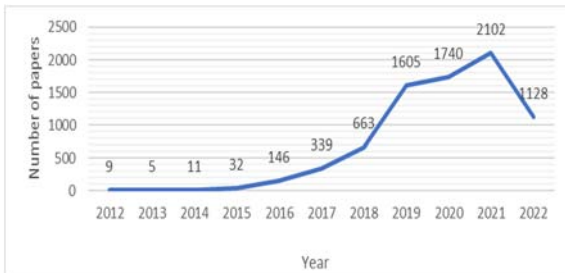


Figure 1 Number of papers "Web of Science" - "Digital transformation"

Source: the authors' contribution

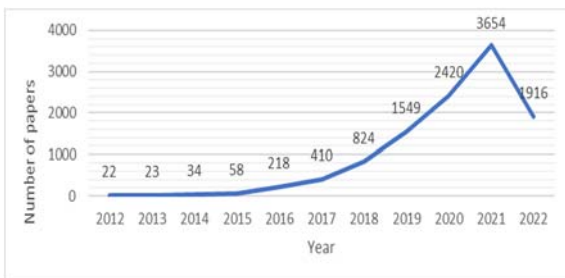


Figure 2 Number of papers "Scopus" - "Digital transformation"

Source: the authors' contribution

A large number of works, however, did not lead to the selection of one generally accepted and most precise definition of this phenomenon. One of the main reasons for this lies in the fact that there is no universal approach for the realization of the transformation process (Kondarevych et al., 2020). Each company has its own approach and follows a different path on its digital journey (Karekla et al., 2021). However, assertion, which has been confirmed by many authors through their works, concerns the role of business processes and business process management in the digital transformation of business. Based on the conducted research, Fischer et al., (2020) state that their analyzed companies used business process management in order to achieve a positive impact on costs, service quality and the customer himself. Also, Ochara et al., (2018) mention business process modeling, which is part of business process management, as a key basis for digital transformation. In their book, Dumas et al. (2013) defined business process management as the science and art of observing the way work is carried out in the organization, with the aim of ensuring consistent outputs and exploiting potential opportunities for improvement. Unlike digital transformation, which is a more recent topic, various sources suggest that business process management has captured the attention of stakeholders as early as the 1990s. Bogea Gomes et al. (2019) observe that most innovations are driven by processes rather than technologies. Brkic et al., (2020) states that technologies are one of the drivers of business changes. As the search results of the previously mentioned index databases confirm, the interest of researchers in this topic has existed for more than two decades longer than the interest in digital transformation. Figure 3 shows that the importance of business processes does not decrease and that they represent an indispensable area during the implementation of undertakings such as digital transformation.

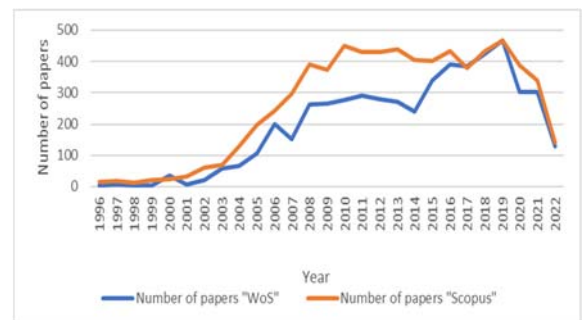


Figure 3 Number of papers - "Business process management"

Source: the authors' contribution

The structure of this paper is organized as follows: after the introduction, Section 1 describes the methodological procedure used. Section 2 summarizes the results of the conducted research while the last section of this paper provides a conclusion.

1. Methodology

The methodology used during the research process was focused on research question: place of business process redesign as a basic aspect of digital business transformation.

The way in which the systematic review process was carried out consists of eight steps, namely (Kitchenham, 2004, Xiao & Watson, 2019):

- 1. Formulation of the research problem;
- 2. Development and validation of the review process;
- 3. Literature search;
- 4. Reviews for inclusion of the study in the work;
- 5. Quality assessment;
- 6. Data extraction;
- 7. Analysing and synthesizing data;
- 8. Reporting on findings.

Figure 4 shows the mentioned process.

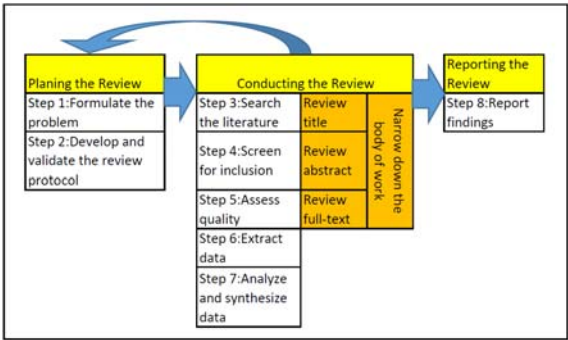


Figure 4 The process of systematic literature review Source: Xiao & Watson, 2019

The first step involves formulating research questions. Research questions are based on digital transformation and business process management (BPM). Due to the wide scope of the given topic, it was necessary to narrow the point of view and introduce additional restrictions. The question that is defined by observing this domain is: place of business process redesign as a basic aspect of digital business transformation.

The second step involves developing and validating the review process. As mentioned in the first step, due to the wide domain of observation, it was necessary to introduce certain additional

keywords. Those are "redesign" and "digital technologies". Thus, the observed domain of works is narrowed.

The third and fourth steps include literature search and review for inclusion in the paper. The channels used to find relevant literature are electronic databases. The electronic databases on which the literature search was performed are "Web of Science" and "Scopus". In order for the work to contain the essence that follows contemporary events, the time period of literature observation is limited to the previous seven years. "Digital transformation", "business process management", "BPM", "digital technology" and "redesign" are the key words that were used when searching the databases. Table 1 shows the final combination of key words used in the search for the primary studies.

Table 1 Final search string and total number of hits

Final Search string	Number of hits		
	WoS	Scopus	Total
Digital transformation AND Business process management	84	95	179
Digital transformation AND BPM	51	52	103
Digital transformation AND redesign	35	61	96
Digital technology AND redesign	19	96	115
Digital transformation AND business proces AND redesign	3	10	13
Total	192	314	506

Source: the authors' contribution

Papers that did not provide a concrete hint in their title that they were conducive to research were excluded from further consideration. The date when the search was carried out is April 2022, while the date of finding the works is also April 2022. After the search, no additional restrictions were introduced. After reading the abstracts of the selected papers, it was concluded that 112 papers will be included in the paper. The next step was to find and eliminate duplicates. After completing this step, there are 92 papers that will be considered by the authors. Papers have been taken from all potential areas that are conducive to the research domain.

When performing the first iteration, only those papers were taken into account that, based on their title, based on the authors' decision and assessment, are suitable for inclusion in the research, i.e. can provide useful information for research. The next step was iteration through the abstracts of the selected papers. The electronic bases mentioned above were used for the given iterations. The period for which the works were observed is from 2015 to 2022. A search of the Web of Science index database using defined keywords resulted in a total of 192 hits. The number of works that were

suitable for inclusion in the work (in the first iteration) is 50. The same procedure was repeated on the second index database - Scopus, where we hit 314 potential works, of which the number of those that were suitable amounted to 62. The total number of papers that were accepted during the first iteration was 112. Then we proceeded to eliminate duplicates. By eliminating duplicates, 92 papers were obtained.

The fifth step includes quality assessment. A detailed reading of the selected works further reduced the number of publications included in the final list of works. In order for the paper to be a relevant reference for a given research, it had to contain an answer to research question. Papers that did not contain any information suitable for research were excluded from further analysis. A qualitative analysis was then performed. Reading the papers resulted in a total of 32 papers that are relevant and included in the paper. The reasons for removing the remaining works were:

1. ongoing research - 2;
2. incomplete work - 3;
3. out of context - 10;
4. not in English - 3;
5. other - 42.

The sixth step is data extraction. A narrative review was performed to extract data. Thus, there was a lower degree of rigor when it comes to the criteria for inclusion in the work. Also, textual narrative synthesis was performed. When extracting data from the works, the data were entered in a separate table, key observations, and notes. The extraction was performed in such a way that the relevant data on the topic was taken.

The seventh step involves analysing and synthesizing the data. Analysing was done for each paper separately, and by synthesizing them, an attempt was made to create a broader picture that would answer the research questions. Figure 5 shows the method of conducting search and evaluation of works.

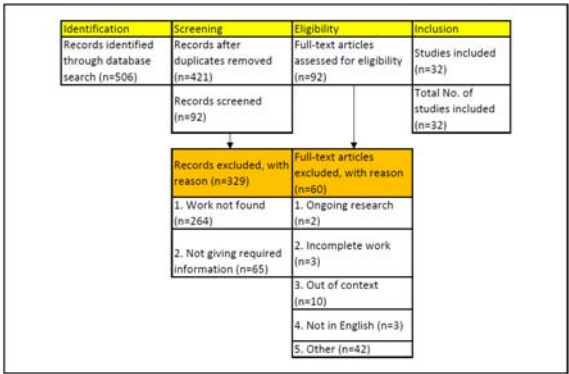


Figure 5 Literature search and evaluation for inclusion in the work
Source: Xiao & Watson, 2019

2. Research results

2.1. Business process redesign as part of business process management

The changes taking place in the global market affect changes within organizations, and they must adapt to new conditions as quickly as possible in order to advance in the market. One of the ways that enables them to follow global trends is to change their business processes (Stjepić et al., 2020). Van Looy, (2018) states that adaptation to changes in the form of business process redesign began in the 1990s and continues to this day. Business processes are series of activities (Baier et al., 2020) aimed at completing set tasks and achieving defined goals. A number of authors state that they represent the core of the company and influence the attractiveness of products and services. Moreover, they define tasks and jobs, which means that they shape the roles of all employees and thus influence the ability of organizations to adapt to new situations and meet growing demands (Dumas et al., 2013).

Due to the importance of business processes, monitoring and managing them effectively are crucial for the company's success (Stjepić et al., 2020). Business process management (BPM) began in the early 1990s when organizations realized the value of IT investments is gained through complementary changes in business processes and work practices that, in turn, have enhanced quality, product offerings, and service delivery (Baiyere et al., 2020). Dumas et al. (2013) state that the ultimate purpose of the business process management initiative is to ensure positive outcomes and maximum value for clients through the selected business processes that are the subject of management. A BPM initiative usually includes the steps shown in Figure 6.

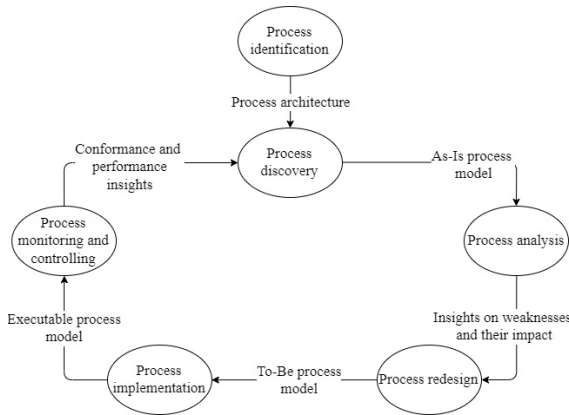


Figure 6 BPM lifecycle
Source: Dumas et al., 2013

2.2. The road to digital transformation

Ismail et al. (2017) ask the right question in their work, which is "Is digital transformation, as a topic, a novelty?". Indeed, if we go back, people have always been looking for changes while doing their jobs. The reason for this does not lie in the desire for changes, but in the pursuit of improvement, i.e. more efficient, effective and better performance of work. The roots of digital transformation can be found in business transformation, a topic on which the first papers appeared in the 1990s.

In general, the term "transformation" became a term for various practices and organizational outcomes in the 1990s. Business transformation is a term that has been used for many years, but defining it is not easy due to the large number of different definitions. One of the definitions given by McKeown and Philip (2003) defined the term "Business Transformation" as a comprehensive concept that includes a series of competitive strategies that organizations adopt in order to bring about significant improvements in business performance. In addition to the use of information technologies, quality management and organizational development, these strategies also include business process re-engineering, which has evolved over time into redesign of business processes as a step of business process management.

Just as the academic community agreed that the digital transformation of business consists of a large number of aspects, so researchers 20 years ago and more saw that business transformation is not a simple undertaking. Various aspects contribute to the creation of complex relationship between operational needs, capabilities, business processes, and organizations involved (Lakemond

et al., 2021). Based on the available literature, Muzyka et al. (1995) divided the initial view of transformation, which was defined as a change in organizational logic as a consequence of fundamental behavioural changes, into 4 types of transformation:

1. Re-engineering - improving overall organizational efficiency while not wholly solving the issue of better workforce engagement;
2. Restructuring - improving efficiency through right sizing (often downsizing), product portfolio pruning;
3. Renewing - achieving better efficiency, effectiveness and innovation through building new capabilities, introducing new business units and redefining the strategy;
4. Regeneration - improvement of existing processes and consideration of existing opportunities.

It was mentioned earlier that in the 1990s, transformations were related to the area of strategy, which included, among other things, information technologies. Enterprises were increasingly dependent on information and means of communication and manipulation of these resources (McKeown & Philip, 2003). Information technologies have become crucial for a large number of companies because the competitive advantage of companies derives from the ability to efficiently generate, maintain and use knowledge about both internal and external aspects of business. Because companies were gaining competitive advantage through the effective generation, use, and maintenance of knowledge about their internal and external environments, information technology has become a critical point for most organizations. Furthermore, technology has been identified as a major dimension contributing to organizational business transformation (Ismail et al., 2017). The significant role attributed to information and communication technologies in the transformation process stems from the recognition of their speed of development and expansion.

Focusing on technological change during business transformation, Ismail et al. (2017) called technology-enabled transformation. The domain of information systems expands the original concept of business transformation by pointing to potential information technologies and their role in IT-enabled transformations (Venkatraman 1994). This type of transformation is basically perceived as a

change caused by a change in information technologies, whereby the impact of information technologies must be reflected on at least 3 of the 7 identified dimensions (Ismail et al., 2017):

1. Processes;
2. New organizations;
3. Relations;
4. User experience;
5. Markets;
6. Customers;
7. Disruption.

Since information technologies formed the basis of transformation, many authors defined the rules and criteria of transformation in accordance with the possibilities of existing information technologies (Ismail et al., 2017).

2.3. Digital transformation

The literature offers different interpretations of digital transformation. Today, technological changes, which form the basis of the previously explained type of transformation, can be seen either as a source of digital threat or as a source of digital opportunities that drive digital transformation (Wessel et al., 2021). Kreuzer et al., (2022) state that the ability to recognize the possibilities of digital technologies is necessary in today's digital world. Therefore, digital transformation is increasingly becoming a central issue for businesses worldwide (Thamjaroenporn & Achalakul, 2021). The characteristics of this era include the rapid development of a large number of new technologies (Liu et al., 2020). The key technologies that are disrupting the market and opening up new opportunities to transform strategies and operations in ways we could not even imagine a few years ago are: cloud computing (Wessel et al., 2021), Internet of Things - IoT, Big Data, Artificial Intelligence - AI (Favoretto et al., 2022; Gurbaxani & Dunkle, 2019; Karekla et al., 2021; Khin & Ho, 2019; Li, 2020; Pînzaru et al., 2019), blockchain and robotics (Karekla et al., 2021). The use of individual digital technologies does not mean the digital transformation of the organization (Kondarevych et al., 2020), but also, the process of digital business transformation does not require the implementation of all the mentioned technologies, but only those that the company estimates can contribute to achieving the greatest benefit. Therefore, companies must possess vision, ability, knowledge, skills, then must show serious commitment and at the same time courage when making certain risky decisions (Pînzaru et al.,

2019).

Digital transformation in itself represents a complex area of research that arises from a large number of different aspects of observation. Existing research points to some of them, such as the digital transformation of society, industry and economy. The introductory part of the paper offered, among other things, 2 figures (Figure 1 and 2) that clearly suggest that a search of academic publications using the keyword "Digital transformation" offers thousands of papers that explore this concept from different perspectives. Ismail et al. (2017) grouped and offered some of the possible perspectives shown in Figure 7.

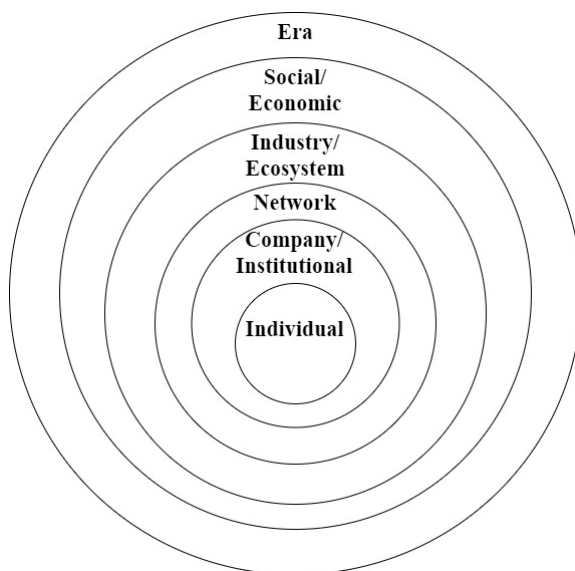


Figure 7 Digital transformation perspectives in the literature
Source: Ismail et al., 2017

According to different perspectives of observation, authors offer different definitions. Most theorizing in the field of digital transformation is driven by the idea of using digital technologies to improve business results (Wessel et al., 2021). However, although digital transformation relies on digital technologies, it represents a much broader concept that includes the analysis and reengineering of business processes, changing strategies, organizational structures, changes in the way of managing the organization, stimulating employees, changes in the required knowledge and skills of employees etc., in order to adapt to the evolving digital business context (Favoretto et al., 2022; Gurbaxani & Dunkle, 2019). Wessel et al. (2021) offer a more detailed definition that also highlights the use of digital technologies in order to improve business outputs, key business processes and task

automation. On the other hand, Saarikko et al. (2020) define digital transformation as a socio-cultural process of adapting firms to new organizational forms and skill sets that are relevant and necessary for survival in the digital age. Observing digital transformation as a socio-cultural process rather than a technical feat does not mean that technology is treated as unimportant, but that they consider organizational culture and ideas rather than technological savvy to be the drivers of transformation. Ivančić et al. (2019) united the two previously mentioned views in defining the concept of digital business transformation, defining it as a continuous process of climbing the scale of digital maturity using digital and other technologies together with organizational practices to create a digital culture.

The broad definition given by Liu et al. (2011) suggests that it represents the integration of digital technologies and business processes. Kaufman & Horton (2015), Schuchmann & Seufert (2015) and Hess et al. (2016) provide a different and more comprehensive view of the digital transformation. They indicate that the use of digital technologies affects on three organizational dimensions: externally, digital technologies influence the improvement of user experience and the establishment of better connections with them; internally, digital technologies contribute to changing the behaviour of employees, the existing ways of doing work and the way of making decisions. A change in the organizational structure can also be counted here; and finally holistic,

where the entire organization is affected which often leads to completely new business models.

In their papers, the authors agreed that the business process management is an important step in realizing the digital transformation of business. As mentioned earlier, business process redesign is one of the business process management steps that emerged from business process re-engineering. Continuous optimization of business processes has become an important factor for many companies to achieve success, competitive advantage and satisfy customer needs (Fehrer et al., 2022). In business process management (BPM), business process redesign (BPR) deals with improving business processes to solve previously identified process-related problems (Dumas et al., 2013). Ismail et al. (2017) defined different levels of digital transformation, which he displayed graphically, depending on the complexity of the transformation (Figure 8). According to this understanding, digital transformation implies only revolutionary levels of transformation that are of a higher level of complexity and impact, i.e. suggests that its degree of complexity exceeds that of previous IT-enabled transformations. Figure 8 shows that the lowest level of digital transformation is the redesign of business processes followed by business network redesign, business scope redefinition, customer experience transformation and business model transformation.

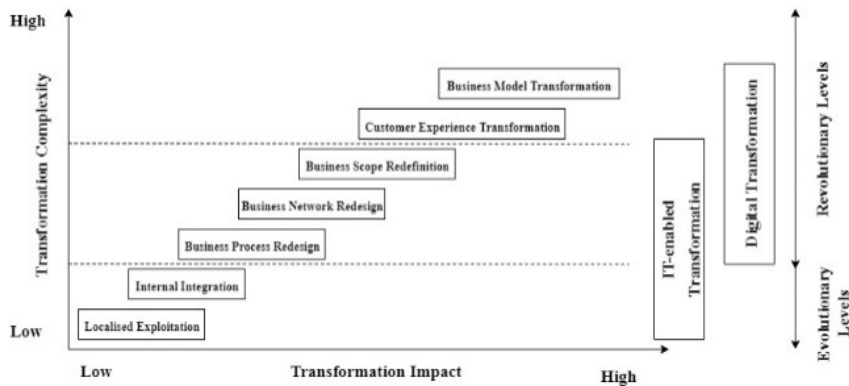


Figure 8 Digital transformation perspectives in the literature
Source: Ismail et al., 2017

In support of the claim about the complexity of the digital transformation of business, as well as the thesis that the implementation of digital and other technologies represents only one step of a much broader process, we can also cite the case study conducted by Ivančić et al. (2019), by which they

identified 7 dimensions of digital transformation,:

1. Strategy – a shared digital vision is considered an important factor in successful digital transformation. Although each company defines its own strategy

- according to its own needs, goals and stage of the digital transformation process, two common things of all strategic approaches have been observed: 1) defining the role of the Chief Digital Officer (CDO) who is in charge of digital transformation projects and efforts and 2) strong leadership support;
2. People – people have always played a huge role in the work and success of the company. For this reason, in the so-called digital culture, organizations use different approaches to find and acquire employees with digital skills. New hires with digital skills are capable of working on a wide variety of projects and in any team. Also, organizations strive to establish and encourage a culture of knowledge sharing between workplaces. A culture of sharing knowledge without fear that someone else will take credit for a certain contribution enables additional benefits for the company;
 3. Organization – a digital transformation project cannot be successfully implemented without the involvement of a large number of different organizational units. Therefore, the digital transformation unit must cooperate with the rest of the company and cannot function independently of others i.e. digital transformation, in addition to the members of the digital transformation unit, requires the inclusion of employees from other departments;
 4. Customers – the quality of service provision is one of the aspects that must be analysed and, if necessary, improved through the implementation of digital business transformation. (Re)designed products and services should provide a better user experience, improve the quality of service and create new value for the purchase, taking into account the different characteristics of the market and being guided by the needs of customers;
 5. Ecosystem – digital transformation projects include the most diverse aspects and goals of the company's operations. One of the main goals is to create a business atmosphere in which clients are perceived as partners. In this way, consumers are involved in the work of the company and its business processes. In addition, but no less significant, it also represents the creation of connections with the academic community in order to gather knowledge, innovation and human resources;
 6. Technology – the implementation of new digital technology requires considering the possibility of connection with existing traditional information technologies. Therefore, digital technologies can be classified as primary and secondary. Primary digital technologies include cloud computing, big data, mobile technologies and the Internet of Things, while secondary digital technologies include wearable devices, artificial intelligence, robotics, etc. Organizations can choose from a set of a large number of modern technologies, depending on the area of digitization. In addition to the adoption of digital technologies, the companies that participated in the case study conducted by Ivančić et al. (2019) emphasized the need and importance of a quality Enterprise Resource Planning (ERP) system;
 7. Innovation – generating new ideas and making contributions that will enable the identification and elimination of certain weaknesses in business should be strongly encouraged by management.

Conclusion

Despite the importance of the trend of digital transformation of business, it covers a very wide area of research, and still in many parts is not sufficiently understood and researched. The growing interest in this topic, both among researchers from the academic community and people from the economy, brings new knowledge and discoveries every day.

The general conclusion can be that digital transformation is a more complex type of business transformation empowered by technology, which, in addition to addressing the strategic roles of new digital technologies and capabilities for successful digital innovation (Yoo et al. 2010), must also consider other activities in order to successfully implement the digital transformation of business. One of those steps represents business process management and redesign as one of its steps. In business process management, business process redesign deals with improving business processes to solve previously identified process-related problems (Dumas et al., 2013). Due to its importance, Ismail et al. (2017) presented the

redesign of business processes in his work as one of the levels of digital business transformation. Successful implementation of business process redesign facilitates the desire to achieve superior performance and sustainable competitive advantage.

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