

## Digital Transformation of Health Services Provided by Medical Centers in Bulgaria

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### Abstract

**Purpose of the article** The purpose of this paper is to shed light on some digitized health services offered to the clients by and excerpt of medical centers in Bulgaria, to determine the stage of digitalization of these services, and to consider potential challenges medical centers face while managing their activity in a dynamic business environment.

**Methodology/methods** The research is based on the analysis of scholarly literature, comparison of medical centers' data and the information included in the official websites of those organizations. Quantitative analysis based on structured interviews has been made to obtain empirical data. In total, 10 completed interviews and 20 expert assessments has been compiled. The empirical data was processed and analyzed using the Microsoft Office Excel software.

**Scientific aim** The scientific aim of the paper is to determine significant aspects connected with the digitization and development of small enterprises like medical centers in Bulgaria. The current study analyzes briefly the necessity of a strategic adaptation to the digital transformation of a business.

**Findings** Based on this research, challenges and important issues that medical centers may face planning and realizing digital solutions have been outlined. The impact of the digital transformation on business is concerned with reducing costs and time to complete management tasks. In addition, supporting informed management decision making in medical centers is reported to be very important. Other essential aspects connected with digitization are creating a favorable team environment in the organization, as well as assuring accuracy and prevention of errors while performing basic activities.

**Conclusions** The presented results are related to the two research questions: the need for strategic adaptation to the digital transformation of business and outlining aspects of the digital transformation on the development of small and medium-sized organizations like medical centers. Medical centers have realized the need of digitization, but this requires strategic concern because the time horizon for revision of the managerial vision for strategic development and digitalization shrinks down to about five years. Based on the investigation, it can be concluded that the digital strategy of the organization is associated with the choice of digital technologies in which to invest effectively, considering the so-called "digital maturity" and the size of the organization.

**Keywords:** business development, health services, digitization & strategy

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## **Introduction**

Digitization penetrates all sectors and activities of the modern economy. Many of the organizations see the digital transformation as a perspective for their business development. The health services segment is not an exception. The purpose of the paper is to shed light on the need for strategic adaptation to digital transformation focusing on digitalized health services. The systematized results are based on analysis of the Bulgarian reality. They figure out the stage of digitization and the potential challenges the medical centers have to face while manage their activity in a dynamic business environment.

In Bulgaria, medical centers are an integral part of the healthcare system. They provide specialized outpatient care. In terms of their size and characteristics, medical centers fall into the category of small and medium-sized enterprises (SMEs), as they operate under the requirements of the Commercial Law.

The paper is part of the research of the authors' team concerning business development and strategic management of healthcare organizations. The scientific aim is to determine the most significant aspects connected with the digitization of small and medium-sized organizations (medical centers) in Bulgaria and their development in the healthcare industry. The current study analyzes briefly the necessity of a strategic adaptation to a digitally transformed business.

### **1 Need for strategic adaptation to digital business transformation**

In today's economic environment, research on global practice increasingly suggests that the digitization of business is a long, logical process that is part of company's strategic management. Back in 2015, for example, a study by the MIT Sloan Management Review and Deloitte University Press on digital business transformation found that it is about integrating digital technologies, including social media, mobile and cloud technologies, to support the way businesses operate. Businesses and organizations that are just considering digital transformation are focused on solving single business problems using individual digital technologies. (For details: <https://sloanreview.mit.edu/projects/strategy-drives-digital-transformation/>).

However, in order to talk about a complete digital transformation of a business, a specific digital strategy is needed. The development and implementation of such a strategy should be a priority for a new type of leaders whose personal characteristics are linked to the ability to change and innovative attitudes. Digitization is also linked to a number of business models used to create sustainable development (Šimberová, Kita, 2020).

Digital transformation of a business is associated with the search for new competitive advantages, especially in the technological domain, which inevitably leads to higher risk-taking (Kirova, 2018). Such a management decision is aided by the attitudes and desires of people to work for businesses and organizations that are strongly committed to the progress of digital transformation. This is a long and arduous process, especially when it comes to the digitization of strategic decision support tools.

Adapting organizations to the digitization of business challenges today's leaders to attract and retain the best new generation professionals who are motivated and have the greatest degree and mindset to work in a digitized environment and implement digital strategy.

Fundamentally, an organization's digital strategy is about choosing digital technologies to invest in wisely and effectively, taking into account so-called "digital maturity", as well as the size of an organization.

A survey of large enterprises in Poland, for example, shows that of the IT tools surveyed for strategic control tasks, companies most often use elementary spreadsheets (MS Excel), and the least used tools are ERP, which, at first sight, should be imperative in large organizations. On the other hand, business intelligence systems are becoming increasingly popular (Bieńkowska, Kral and Zabłocka-Kluczką, 2017; Boneva, 2018).

A study in the United States shows that in the early stages of an organization's digital maturity, only 15% of enterprises are transforming their processes and considering digitizing their business models. However, a clearly articulated and implemented digital strategy is shared by about 80% of so-called "digitally mature" enterprises.

Like any corporate strategy, a digital business transformation strategy is tied to a clearly defined goal and scope of action.

In the early stages of digital maturity, the organization tends to focus on individual technology decisions (which also appear strategic in terms of their importance to the organization's development) made for the needs of a specific problem. In digitally mature organizations, strategies are developed to transform the whole business.

Digitally maturing companies are gradually building organizational skills to implement the strategy. A study in the US shows that digitally mature organizations are about four times more likely to assess the knowledge and skills required from their employees than organizations in the early stages of maturity. All of this suggests that early stages of digital maturity lack skills to assess the impact of technology on the business, respectively on employee evaluation and motivation in an evolving environment.

In another study, it was noted that in the age groups of 22 to 60 years, a large proportion of employees want to work for organizations with digital business transformation, and the risk of new technology penetration is perceived as a challenge (For details: <https://sloanreview.mit.edu/projects/strategy-drives-digital-transformation/>).

Researchers' summaries on the topic boil down to the fact that in the transition to digitization, the biggest obstacles and challenges are related to the organization itself – its skills, capabilities and organizational structure (Gupta, 2018). In order to provide appropriate digital solutions and services to its customers, an organization must thoroughly analyze the needs of these customers (Krilova, Ciemleja and Lāce, 2019).

## **2 Aspects of digital transformation on the development of small and medium-sized organizations**

A number of studies have shown positive digitization trends in the management of different types of services (Zarina, Voronova and Pettere, 2019). Aspects of digital transformation in small and medium-sized businesses can be found in different directions. This paper attempts to summarize the more common ones.

- Rationalization of functions and tasks through information technology

This aspect is linked to the definition of management functions and tasks that are most essential in the management of an organization. The aim is to check whether there is a scope for automating specific tasks linked to the performance of management functions, thereby improving processes and activities. A good example is the use of an integrated accounting software in order to avoid errors when doing timely and detailed accounting of sales, deliveries, production. This, in turn, is the basis for business planning, for controlling or organizing the processes of accounting, delivery, and warehousing.

- Ensuring accuracy and preventing errors in the execution of basic activities

In this area, automation of daily operations can help reduce human error. The use of integrated programs to manage specific tasks allows setting control parameters and deadlines. This significantly reduces the likelihood of fatal errors in daily operations and activities. Digitization can help the organization to eliminate errors at every stage of the activity (by forming the so-called control points and selecting control activities). In this way, the modern understanding of process orientation of internal control can be realized, and a significant part of activities and processes can be covered (Mihaylova and Papazov, 2021).

- Substantiating the importance of informing management decisions

In a digitization environment, organizations are striving to be competitive in the market. In this case big databases are becoming one of the most important factors of the business environment. With the help of big databases, the performance analysis of, for example, on-line sales, advertising and real-time marketing tools is supported. All this can assist small and medium-sized businesses in the so-called informed selection of tools, methods, approaches to planning, organizing, control.

- Reducing cost and time for management tasks

Cost-reduction is one of the main aspirations of business organizations. Analysis of the business environment highlights opportunities that, through digital transformation, can support the implementation of planned strategies. This improvement can be sought in both cost and time factors. Digital transformation enables tasks and activities to be managed quickly and seamlessly through various technologies (e.g., cloud technologies). In this regard, a very good analysis of the use of the organization's available assets and resources is necessary (Gupta, 2018). The analysis should focus on comparing the cost-effectiveness of using real and digital assets, as well as the time to complete an activity using real and digital assets.

- Creating a supportive team environment in the organization

Organizations that are in the early stages of digital transformation typically have a collaborative and mutually supportive mindset when it comes to tasks and activities. Interaction in digital transformation also supports the growth of small businesses, for example in the implementation of Customer Relationship Management (CRM) systems (as a part of an ERP system).

The aforementioned aspects of digitization in small and medium-sized organizations are linked to a study on digital transformation as a business development perspective in Bulgaria. Information on the use of digital systems in differently sized organizations in Bulgaria is presented in Tables 1, 2 and 3. As is evident from the presented information, the level of digitization, measured on the basis of the use of ERP systems, software applications for managing information about clients (CRM) and systems for automating accounting activities is not high: on average about 1/6 of all enterprises in Bulgaria use such high-tech tools. Large enterprises are the most active in this respect, which is explainable by the fact that they have the most investment resources.

**Table 1** Enterprises using ERP software package (%)

|                              | 2019 |
|------------------------------|------|
| Total                        | 23.4 |
| By size class                |      |
| 10 – 49 persons employed     | 19.2 |
| 50 – 249 persons employed    | 40.1 |
| 250 or more persons employed | 60.7 |

Source: National Statistical Institute of Bulgaria, 06.12.2019

**Table 2** Enterprises using software application for managing information about clients (CRM) (%)

|                              | 2019 |
|------------------------------|------|
| Total                        | 17.2 |
| By size class                |      |
| 10 – 49 persons employed     | 15.3 |
| 50 – 249 persons employed    | 24.9 |
| 250 or more persons employed | 34.1 |

Source: National Statistical Institute of Bulgaria, 06.12.2019

**Table 3** Enterprises sending e-invoices suitable for automated processing (%)

|                              | 2020 |
|------------------------------|------|
| Total                        | 10.0 |
| By size class                |      |
| 10 – 49 persons employed     | 8.9  |
| 50 – 249 persons employed    | 13.8 |
| 250 or more persons employed | 24.2 |

Source: National Statistical Institute of Bulgaria, 11.12.2019

For successful digitization of processes and activities it is necessary to set common team goals, determine the direction of joint actions and the appropriate digital tools through which information on the results will be continuously exchanged.

The digitization of medical services is a widely discussed topic worldwide and has been heavily influenced by the development of the COVID-19 pandemic. Demand for medical services using digital platforms is growing as social distancing measures increase in many countries. From a business development perspective, virtual consultations, use of communication platforms, etc. has helped patients (customers of the medical service) overcome initial behavioral barriers to digitization.

A number of studies show a significant increase in the number of new users of online platform for healthcare services in China, for example. There has also been a surge in the use of digital health platforms in Singapore, and initiatives to promote on-line medical services have been launched in South Korea and Japan (Ho, Caals and Zhang, 2020). In Romania, one of the strategic goals is the complete digitization of the healthcare system and the elimination of paper records to maximize the efficiency of the medical service and to provide the population with rapid access to healthcare services (Roman, 2021). The German Federal Government recognizes the growing role of digitization in healthcare and the potential to improve diagnosis and treatment through a wider application of IT in medical research. The Medical Informatics Funding Scheme (MIFS) has multiple objectives, including to exploiting of opportunities created by the digitization in medicine, to develop innovative IT solutions to improve patient care and research, to accelerate the exchange and use of data between individual organizations (prioritized between medical centers and laboratories), and to improve education, training, and professional development in medical informatics and healthcare management (Semler, Wissing and Heyder, 2018; Mitev, 2020).

Given the generalizations made about the growing role and importance of digitization for the development of various activities, an investigation was conducted among medical centers in Bulgaria on the extent of digitization of activities, the development of a digitization strategy and opportunities for development.

### **3 Research methodology and results**

In Bulgaria, some health services offered to the public are part of outpatient care facilities. According to The Medical Establishments Act (adopted 1999, as amended on 09.02.2021) defines a medical center as a healthcare establishment that provides specialized outpatient care and employs at least three doctors with different recognized specialties. In terms of their size and characteristics, these medical centers fall into the category of small and medium-sized enterprises (organizations), as they operate under the terms of the Commercial Law of the Republic of Bulgaria (adopted 1991, last amendment on 08.12.2020).

This publication presents an analysis, which is only part of a more in-depth study of the author's team, related to business development and applied strategic analysis tools in medical centers in Bulgaria and leading European countries. The investigation is made from an economic and managerial point of view and has a limited (case-study) nature.

The study is based on structured interviews conducted among 10 medical centers, in which 20 experts were covered and gave their opinion and vision on the development of digitization in medical centers. The survey was held in the period May-June 2021 and the empirical data were processed and analyzed using Microsoft Office Excel software.

The summarized results are presented in the context of the main aspects of the digitization of the organizations in Bulgaria mentioned in the previous paragraph. In a synthesized form the following can be noted regarding:

- **organizational level of digital maturity** The studied healthcare centers are in their early stages of digitization or have partially digitized processes and activities.
- **digitization strategies developed** Only 15% of organizations have digitization issues addressed in their strategy documents. The majority have not yet developed a strategic vision for their digitization or, if they have such intentions, they are not in full form.
- **prevalence of platforms** Predominant platforms are the interactive communication, digitization and information exchange between patients and the medical center. All medical centers included in the study are successfully using such a platform.
- **execution of a service** With the help of information technology, the bulk of the functions and tasks of medical centers have been streamlined. For example, digital radiography performed by medical centers has a number of advantages over traditional radiography. Digital images can be easily stored and thus the outcome of the treatment carried out can be tracked and the patient's condition compared over time. In this way, activities can be monitored, and results planned.
- **assurance of accuracy and prevention of errors in the execution of basic activities** One of the fully shared examples in this regard is the high image quality of digital radiography, coupled with the processing capability that facilitate medics in making a correct and accurate diagnosis. In contrast to

conventional radiography, in digital radiography the irradiation is reduced many times (approximately 10 times) without affecting the quality of the image obtained.

- **provision of support for informed management decision-making** In medical centers, digital charting and laboratory tests greatly aid decision-making. Thanks to digital imaging, the image can be further processed, and necessary measurements can be taken, which is important for accurate diagnosis and treatment. All medical centers point out as one of the main advantages that a consultation with leading specialists can be made immediately and remotely by sending the image over the internet.
- **reduction of cost and time to complete tasks** Medical centers report that, for example, when ordering laboratory tests, the digitized service allows each patient to receive a unique identification number, guaranteeing complete identity between the biological material and the patient, a high degree of security and confidentiality of results. The results are obtained only through the corresponding individual number, or a medical person authorized by the patient via the Internet. This reduces the cost and time associated with obtaining the result and enables a much faster decision to be made regarding the patient's treatment. This information is needed by medical centers to be able to offer additional services for the prevention or recovery of patients.
- **creation of a supportive team environment in the organization** The surveyed medical centers in Bulgaria fully share the opinion that digitization creates a favorable environment for working in a multidisciplinary team. For example, using a multifunctional telemetry system to directly and remotely monitor, record and analyze multiple patient vital signs using a discrete and convenient device. This system allows real-time monitoring of electrocardiogram, heart rate, arterial pressure, oxygen saturation, respiratory rate and body temperature of the patient. These indicators provide crucial information about the patients' condition. The simultaneous recording of several indicators that are essential for the assessment of the patient's condition and for the establishment of an accurate diagnosis can be used to examine different specialists or to form a team to discuss the condition, the diagnosis and the planned treatment.

The presented results show that medical centers as part of the organizations operating under the Commercial Law in Bulgaria show trends in terms of digitization similar to other business organizations. The focus is on processes that are directly related to patients (who are essentially the customer group of medical centers). These organizations are also looking for ways to continuously evolve, including through digitization of processes, although they are still in the initial phase of digitization. The study has some temporal and spatial limitations, and naturally cannot anticipate all the responses in the Covid-19 environment and the specific prerequisites for expected changes in process management.

## Conclusion

The findings presented in this paper show that medical centers as part of the country's business sector are also well embracing the digitization process. This necessitates the search for strategic solutions for digitization of healthcare services.

The results presented in this paper are related to the two research questions: In the first place, showing the need for strategic adaptation to the digital transformation of the business. In second place, outlining the aspects of digital transformation on the development of small and medium-sized organizations, including medical centers in Bulgaria.

Based on the review, it can be concluded that, firstly, the digital strategy of the organization is associated with the choice of digital technologies to invest in wisely and effectively taking into account the so-called "digital maturity" and the size of the organization; secondly, the management vision for strategic development is linked to digitization, but the time horizon for review is limited to five years; and thirdly, in terms of the key aspects of the impact of digital transformation on the business, reducing the cost and time of management tasks is essential.

Alongside this, supporting informed management decision-making at medical centers, for example, improves service delivery and ensures quality of service. In conclusion, the increasing role of digitization in healthcare and the potential to improve diagnosis and treatment through a wider application of information technology should be noted.

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