

# DIGITAL TRANSFORMATION AS A STARTER OF THE CREATION OF NEW ECONOMIC BUSINESS MODELS

Nataša Đalić<sup>1</sup>, Živko Erceg<sup>2</sup>

<sup>1</sup>University of East Sarajevo Faculty of Transport and Traffic Engineering, Dobo, Bosnia and Herzegovina, [djalic.natasa@gmail.com](mailto:djalic.natasa@gmail.com)

<sup>2</sup>University of East Sarajevo Faculty of Transport and Traffic Engineering, Dobo, Bosnia and Herzegovina, [zivkoerceg@gmail.com](mailto:zivkoerceg@gmail.com)

Review paper

<https://doi.org/10.7251/JIT2401055DJ>

UDC: 330.341:005.591.6

**Abstract:** Digital transformation refers to major changes occurring in all sectors of the economy and society, as a result of the introduction and integration of digital technologies into every segment of human life. The subject of research work is the contribution of the process of digitization and digital transformation to the improvement of the business processes of companies in Bosnia and Herzegovina. One of the sources of competitive advantage of modern companies is digital technology, which, due to the accelerated development of information and communication technologies, is changing the way of functioning and adapting to a more innovative way of doing business. The problem of research work manifests itself through the question of whether the application of digital technology and digitization affects the business operations of companies and the choice of their business strategy, and whether digital transformation can represent the strategic determination of companies in Bosnia and Herzegovina in modern business conditions. The goal of the research is to investigate the meaning, characteristics, and role and functions of digitization and digital transformation in the business of the company. The paper will present a comparative analysis of the digitization process of business in Bosnia and Herzegovina with the European Union.

**Keywords:** digitization, digital transformation, digital economy, new economic business models

## INTRODUCTION

Digital opportunities, scopes and limitations, and accelerated technological development, lead to a global digital transformation of society. The application of modern technological achievements changes almost all spheres of human life, the way he works, communicates, buys and spends his free time.

Business transformation is an extremely complex initiative that primarily aims to improve the company's operations through all its functions. The newest and most current model of the modern business concept or form of business is digital business. Its basic feature is manifested in solid support of digital technology, i.e. digitization of business processes at all levels within the company.

What is crucial in the context of digital business, which is based on the described digitalization, is based on data and information. According to Celik, digitalization through this concept means the reorientation of interactions, communications, business functions and business models into digital models

that often come down to a mix of digital and physical content, integrated marketing or smart production with a mix of autonomous, semi-autonomous and manual operations [2].

The connection between digitization and digital business is manifested in the fact that digitization actually represents the direction or movement towards digital business, and this process is often described as digital transformation. Krsmanovic states, the above-mentioned process represents a systematic process of intensive application of digital technology and resources with the aim of converting them into new revenues, business models and ways or forms of business [8].

Digital transformation, with its immediate impact on awareness, ideas, paradigm shift and way of doing business, led to the creation and expansion of the digital economy, as a completely new and previously unknown model of digital business.

Digital transformation has produced profound changes in the way we do business and live, which are reflected in several of the most significant points

of the digital economy (innovation and technological progress, through the growth of the startup ecosystem, through the global market and availability, Freelancing and the gig economy, platform business models, new revenue models and digital security and privacy).

All these changes represent great challenges, but also opportunities for companies and individuals who are ready to adapt and take advantage of the potential of the digital economy. This transformation is not only technical, but has deep cultural and social implications that shape our daily lives and the future of business. In the international economy or modern practice, this transformation occurs at the moment when a company decides in a relatively short period of time to fundamentally change business processes, strategies, activities, hierarchical and organizational structure, all with the aim of optimally connecting these elements and achieving better business results.

## REVIEW OF CURRENT LITERATURE

According to the author [2], the process of digital transformation represents one of the most comprehensive transformations of the business environment that took place in the last hundred years, as a result of which its potentials, which were used within the framework of new digital innovations, represent a significant challenge for all industrial branches, as well as national economies.

Contemporary business is a term that over time, and during the past three decades, began to be used in economic thought and profession, as a term that indicates numerous changes in today's business, compared to the traditional one. They are, for the most part, the result of dynamic technological development and its intensive support for everyday business processes. Technology is a commonly known and often used term, both in science and in practice. Krsmanovic states, while it once represented an innovation and an exception, today it is increasingly an essential resource in the international economy and global society [9]. The unprecedented and accelerated development of technology has influenced the establishment and strengthening of virtual communication, as well as the digitization of business and people's daily lives.

According to the author [10] who defines the digital economy as an economy based on digital technologies, including digital communication networks and other related information technologies.

In the digital economy, organizations use digital tools to automate processes, analyze data, connect with customers and expand their business to the global market. Also, digital communication networks enable fast and efficient exchange of information between different actors in the economy. This definition emphasizes the key components of the digital economy, emphasizing the importance of digital technologies and communication networks in shaping the modern business environment.

Digital and information communication technology is a product of scientific and technological progress, as well as general development during the second half of the 20th century. Considering their importance in modern business, it is pointed out that they increasingly exceed the level of revolution, and are maintained through economic, sociological and cultural effects and implications, states Krsmanovic [10].

According to Drucker, technology in general, which initially refers to digital technology, contributes to modern business in various ways. It is based on data and information, advanced knowledge, understanding and critical thinking [4]. Djalic and the group of authors point out, in order to clarify the meaning of the concept of digital business in the simplest and at the same time complete way, it is important to define the original concept of digitization. It is a complex term that refers to enabling, improving and transforming business, functions, models, processes and activities or, in one word, business using digital technologies and using digitized data [5]. What is crucial in the context of digital business, which is based on the described digitalization, is based on data and information. In this context, digitization means the reorientation of interactions, communications, business functions and business models into digital models that are often reduced to a mix of digital and physical content, integrated marketing or smart manufacturing with a mix of autonomous, semi-autonomous and manual operations, Celika claims [2].

The connection between digitalization and digital business is manifested in the fact that digitalization actually represents the direction or movement towards digital business. This process is often described as digital transformation. It represents a systematic process of intensive application of digital technology and resources with the aim of converting them into new revenues, business models and ways or forms of business, highlights Krsmanovic [8].

Digitization and digital business are interrelated concepts that together shape the way organizations work and provide value to their customers. Digitization represents a fundamental change in the way organizations handle information and business processes, while digital business means a step further in utilizing these digital resources to improve business in a broader sense.

Together, these two concepts form the basis for adaptability and competitive advantage in today's digital ecosystem. Organizations that are able to effectively use digital resources have a greater chance of success in the modern business environment.

According to Kotler, digitization as a process is carried out through the application of digital technologies, directly or indirectly, and as a rule has an impact on the creation of value and competitiveness, the organizational design (structure) of the company, human resources, production processes or services, the reward and promotion system and the profiling of the development strategy [7].

A group of authors [14] believes that digital transformation can be defined as a change in the way a company uses digital technologies to develop a new digital business model, and helps create new value for the company.

Digital transformation enables human beings and autonomous devices to collaborate using information technology (IT), which is enabled by big data, cloud computing, and mobile technologies and social networks, states Anthony [1].

## **DIGITAL TRANSFORMATION AS A SOURCE OF BUSINESS GROWTH AND DEVELOPMENT**

Digital transformation has become a key factor for the growth and development of companies in today's technologically advanced environment.

Digital transformation, with its direct impact on ideas, behavior and change of paradigm, focus and way of doing business, undoubtedly led to the creation and expansion of the digital economy, as a completely new and previously unknown model of market business.

The trend of adopting digital transformation strategies in the corporate segment encourages all companies to focus more strongly on improving their business. Based on research findings, analysis, as well as visible indicators that the process of applying modern

technologies brings with it, the conclusion emerges that digitization brings not only numerous but also profound changes, both in business and in other segments of social life.

According to Kotler, the digital transformation of business is accompanied by a new way of thinking, approaching problems and solving them. In this regard, experts estimate that the key to successful digitization includes: new strategy, improvement of user experience, digital marketing, modern CRM system, development of a new management and business model, and innovative organizational design. Its effects are reflected in the increase in profitability, growth and development of companies in various production and service sectors, which most often in practice can also mean the redefinition of current business models [7].

The process of digitization and digital transformation has a significant impact on economic effects in the company, and it manifests itself in several ways:

- The implementation of digital technologies enables the automation of routine tasks and processes, which reduces the time needed to perform business processes, and the aforementioned results in an increase in efficiency and productivity in the company.

- Digital transformation enables businesses to collect, analyze and use data in a way that facilitates informed decision-making. This can lead to a better understanding of the market, customer needs and industry trends.

- Through the implementation of digital technologies, companies can improve the quality of their products or services, increasing customer satisfaction and increasing competitive advantage.

- Digital platforms enable communication with customers in real time. This enables a faster response to questions, complaints or requests, which increases customer satisfaction.

- Digital platforms enable communication with customers in real time. This enables a faster response to questions, complaints or requests, which increases customer satisfaction.

- Digitization enables better monitoring and management of resources, including human resources, materials and financial flows. This can lead to more efficient use of resources and reduced costs.

- Companies that are leaders in the process of digital transformation usually have an advantage over the competition. This may include better utilization

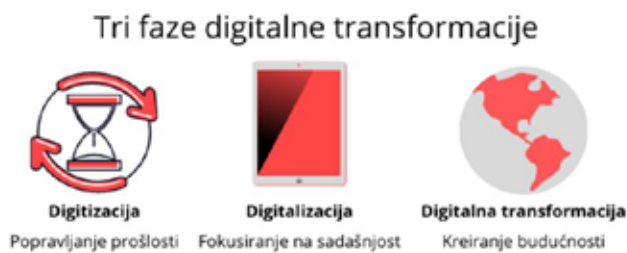
of technological solutions, faster response to market changes and innovative approaches.

- Digitization enables flexible work arrangements, including remote work. This can improve employee satisfaction and help attract talent.

- Digital transformation enables companies to more easily access the global market and expand their business beyond local borders.

- Through digitization, businesses can implement sustainable practices, including reducing the consumption of paper, energy and resources.

All these advantages together contribute to strengthening the company's competitive position on the market and create a foundation for long-term success. However, it is very important to emphasize that successful digital transformation requires careful planning, investments in employee training and constant adaptation to changes in the technological environment.



*Figure 1. Phases of digital transformation*

Digital transformation is by its nature multidisciplinary, as it includes changes in strategy, organization, information technologies, supply chains and marketing. In this regard, business success requires an increased understanding of how companies can gain a sustainable competitive advantage by transforming their business, what strategies they should adopt to improve their business, and how to change their organizational structure to support the new strategy.

According to a group of authors [14], three external factors can be identified that drive the need for digital transformation. First of all, with the advent of the World Wide Web and its adoption worldwide, the need for an increasing number of supporting technologies (e.g. broadband Internet, smartphones, Web 2.0, cloud computing, speech recognition, online payment systems and cryptocurrencies) was expressed, and what has strengthened the development of e-commerce. It is estimated that the ubiquity of big data and the

emergence of new digital technologies such as artificial intelligence, blockchain, the Internet of Things and robotics will have far-reaching consequences for business. Although not all of these technologies may be as powerful as expected, the arrival of new digital technologies clearly signals the need for companies to digitally transform their operations. In addition, these new technologies can also affect the company's cost structure by replacing humans with robots, virtual agents or optimizing logistics flows and reducing supply chain costs using artificial intelligence and blockchain.

New digital technologies contribute to a drastic change in competition. Not only has the competition become global, but the intensity of the competition has also been changed by large information-rich companies (eg Amazon, Alphabet, Apple and Facebook from the USA or Alibaba and JD from China) that have begun to dominate numerous industries.

Also, consumer behavior is changing in response to the digital revolution. Market figures show that consumers are shifting their shopping to online stores. With the help of new search tools and social media, consumers have become more connected, informed, empowered and active. Digital technologies allow consumers to co-create value by designing and customizing products, performing distribution activities, and helping other customers by sharing product reviews. Mobile devices have become an important factor in the behavior of today's consumers. Consumers are also heavily reliant on apps and new technologies based on artificial intelligence. These new digital technologies are likely to structurally change consumer behavior and, consequently, the use of new digital technologies can easily become the new norm and defy traditional business rules. If companies cannot adapt to these changes, they become less attractive to customers and are likely to be replaced by companies that use such technologies.

Digital change within an organization can be divided into three phases, from relatively simple to more complex change, which include: digitization, digitalization and, finally, digital transformation, states the group of authors [15]. In recent times, almost all companies in most industrial branches have been most affected by the technological environment due to digitization, which represents the transformation of physical into virtual content, as well as due to digitalization, which represents the processing of digitized content, states



the group of authors [15]. This transformation is a consequence of the process of digitization and conversion of physical resources, information and processes into virtual form, as well as digitization that includes the processing and processing of digital content. These two processes bring numerous changes and new opportunities, but also challenges for business.

Thus, digitization is the encoding of analog information into information in a digital format in such a way that computers can store, process and transmit such information, states the group of authors [14]. Examples refer to the use of digital forms in appropriate processes, the use of digital surveys or the use of digital applications for internal financial transactions. Typically, digitization mostly digitizes the documentation process, but does not add value to the business.

Digitization describes how digital technologies can be used to change existing business processes. Through digitalization, companies apply digital technologies with the aim of optimizing existing business processes by enabling more efficient coordination

between processes and/or creating additional user value through improving the user experience. Thus, digitization is not only focused on cost savings, but also includes process improvements that can improve customer experiences. Digital transformation is the most extensive phase and describes changes in the entire company that lead to the development of a new business model. Companies compete and can achieve a competitive advantage through their business models, which are defined by the way the company creates and adds value to customers, which aims to make a profit, states the group of authors [13].

Digital transformation affects the entire company and its ways of doing business and goes beyond digitization - the change of simple organizational processes and tasks. Processes are being rearranged to change the company's business logic and the ways in which value is added. The use of IT is transformative and leads to fundamental changes in existing business processes, routines and capabilities, and enables entry into new or exit from current markets. The great

**Table 1.** Trends in digital transformation

| Technology               | Description  | Positive influences   | Negative influences   |
|--------------------------|--|---|---|
| Implantable technologies | Devices implemented in the body, such as a pacemaker   | Useful for health checks or locating missing children   | A threat to privacy and data security   |
| Wearable Internet        | Technologies in mobile phones designed to fit into clothing and accessories  | Self-sufficiency and better decision-making   | Threat to privacy and data security, addiction  |
| Internet of things       | Connecting everything to the Internet through sensors and appropriate applications                                       | Increase in productivity, improved quality of life, safety (food, autonomous vehicles, airplanes, etc.), creation of new companies, connection with the environment | Privacy concerns, loss of traditional jobs, security threats  |
| Smart cities             | Energy management, material flows, logistics and traffic with the help of sensors and data platforms                     | Increased productivity, improved quality of life, lower crime rates, increased mobility, better access to education   | Privacy concerns, risk of system collapse, cyber attacks  |
| Big data                 | Manage and use massive amounts of data for automated decision-making when building and customizing services in real time | Better and faster decision-making, cost savings, new job categories   | Job loss, privacy concerns, questionable data trust, questionable data ownership  |
| Driverless cars          | Threat to privacy and data security, dependency  | Improved safety, less impact on the environment, improved mobility of the elderly and infirm  | Job loss, cyber attacks, less income from public transport  |
| Robotics                 | Application of robots in design, construction and other operations   | Hard work of people replaced by robots  | Job loss, liability, dependence on machines   |
| Blockchain               | A distributed trust mechanism designed to track transactions   | Increased transparency, disintermediation of financial resources  | People's trust, fear of unrealistic thinking about finances   |
| Sharing economy          | Exchange of physical goods, property or services   | Increased access to resources, better use of assets   | More labor contracts, reduction of gray economy, abuse of trust   |
| 3D printing              | Creating physical objects by printing a drawing or model layer by layer  | Accelerated product development, growing demand for designer products, more personalized products   | Job loss, piracy, uncontrolled production of body parts, opportunity to print items such as weapons which pose a danger |

advantage of using digital technology is in achieving a competitive advantage by transforming the company and using existing core competencies or developing new ones.

According to the group of authors, new development trends of digital transformation include the implementation of new digital technologies under the common name Industry 4.0 or the fourth industrial revolution [11]. The rate of technological development in Industry 4.0 is exponential and, therefore, predicting the challenges and even the benefits is much more difficult than what the world has experienced in previous industrial revolutions. The fourth industrial revolution is also bringing a shift in the way technology, communications, data and analytics affect the way we live, work and relate to each other.

A group of authors [11] provided an overview of certain new trends in digital transformation along with their positive and negative impacts (Table 1).

All the mentioned technologies have the potential to increase productivity and bring digital transformation to the organization, whether they are presented or used separately, or in combination, and the only chal-

lenge is the right choice of technology.

The context of digital transformation in Bosnia and Herzegovina is reflected through the State regulation and legal frameworks as well as through the competences and legal framework.

An analysis of the available secondary data according to the DTS approach is presented in Figure 3. The analysis focuses on the current trends in the integration of digital technologies and the factors that enable it.

When it comes to the digital infrastructure indicator, Bosnia and Herzegovina is at the bottom of the table compared to other European countries. According to DTS 2018, drivers of digital transformation include:

- Digital infrastructure,
- Supply and demand of digital skills,
- Entrepreneurial culture,
- Investments and access to finance,
- e-leadership.

Based on the mentioned enablers, DTS 2018 calculates the Digital Transformation Enablers Index (DTEI), which was developed by linear combination of each of the DT enablers indices. DTEI enables the ranking of EU countries.

Table 2. Methodological approach to presenting secondary data

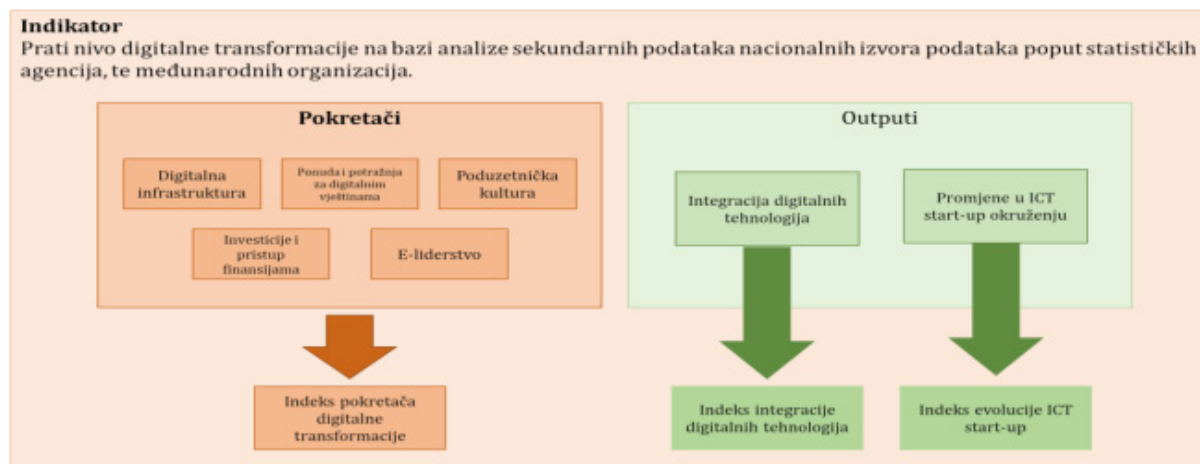


Table 3. Indicators of the digital infrastructure dimension

| Indikator   | Izvor podataka               |
|---|------------------------------|
| Preduzeća koja koriste DSL ili drugu fiksnu širokopojasnu vezu  | Eurostat                     |
| Propusnost Interneta  | Global Competitiveness Index |
| Postotak preduzeća koja imaju ERP softverski paket za razmjenu informacija između različitih funkcionalnih područja | Eurostat                     |
| Postotak preduzeća koja koriste upravljanje odnosima s klijentima   | Eurostat                     |

The availability of digital infrastructure is a driver of digital transformation, and consists of the indicators presented (Table 3.)

Political fragmentation affects the coordination and implementation of national projects, including those in the field of information technology. Different governments have different priorities, which can lead to misalignment or duplication in digital initiatives.

Bosnia and Herzegovina lags behind some of its European neighbors in terms of digital infrastructure development. Infrastructure modernization and Internet access are key to the success of digital initiatives.

The European integration process could encourage the development and adoption of digital initiatives. EU funds and programs can provide the necessary funds and expertise for the development of the digital economy.

## RESEARCH RESULTS

Bosnia and Herzegovina as a developing country has a lot of room for progress in terms of technology and digitization. The technological progress of companies in Bosnia and Herzegovina varies significantly, ranging from the fact that some companies almost do not use digital technologies to those that are at a higher level of digital business transformation.

It is evident that there are differences in the level of digital transformation depending on the sector in which companies operate. Companies engaged in production as the main drivers of digital transformation represent business needs for solving problems in production. The size of the company also somewhat determines the level of digital transformation of the business. However, it is interesting that medium-sized companies (from 50 to 249 employees) have a higher rate of technology adoption. The internationalization of business is also a significant indicator of the focus on the adoption of digital technologies in business. Organizations that have entered the European and international markets with their products have a greater degree of regulation of business processes, harmonization according to international business standards, which consequently requires digital transformation that enables digital records of business events, easy proof of business facts during internal and external audits.

On the basis of research carried out using a comparative analysis of the process of digitalization of business in the European Union and Bosnia and Her-

zegovina, it can be assessed that the level of digital transformation in Bosnia and Herzegovina is low to moderate. Businesses face different challenges in all areas that are defined as drivers of digital transformation: digital infrastructure, supply and demand of digital skills, entrepreneurial culture, investment and access to finance and e-leadership. According to most indicators, Bosnia and Herzegovina (BiH) is below the average of the European Union (EU), at the bottom of the table. Taking into account the complexity of the organization of Bosnia and Herzegovina, governments at different levels are trying to define measures to achieve digital transformation of the country, but the results are barely visible. The projects of international institutions and organizations that are very active in this field have a significant impact on improving the state of digital transformation. In Bosnia and Herzegovina, there are several examples of successful digital transformation (DKS) initiatives that can serve as a model or inspiration for similar projects within the country and beyond (health information system, digital academy, online e-commerce platform).

The level of digital transformation in any country is complex and depends on many factors including politics, education, economic stability and others. It is important that governments, businesses and educational institutions work together to create an environment that encourages digital transformation and enables businesses to realize its potential.

When it comes to the indicator of digital infrastructure, BiH, in comparison with other European countries, is at the back of the table.

In terms of supply and demand for digital skills, BiH is far behind the countries of the region when it comes to talent competitiveness. In addition, BiH is at the bottom of the table that ranks countries according to the percentage of employment of ICT experts, as well as the percentage of companies that have provided employees with portable devices that enable a mobile connection to the Internet for business use.

The assessment of entrepreneurial culture shows that although entrepreneurship is considered an attractive profession, very few people intend to become or become entrepreneurs. The reasons for this can be found in many factors, starting from macroeconomics, those related to the process of establishing a company, and ending with the business environment itself, as well as personal characteristics of people. The conclu-

sion regarding investments and access to finance when it comes to BiH is that it is relatively easy to get a loan (especially compared to other countries in the region). However, when it comes to investing in research and development, the availability of venture capital, and raising money on the stock market, BiH is worse positioned than most neighboring countries. It is interesting that the total tax rate (share of commercial profit) is much lower than in developed European economies.

When it comes to the e-leadership indicator, Bosnia and Herzegovina is in the lower part of the table. According to the data related to the percentage of companies that trained ICT/IT experts to develop/upgrade their ICT skills and the percentage of companies that provide their employees with portable devices for mobile internet connection, BiH is not at the very bottom. However, Bosnia and Herzegovina is the worst ranked country in terms of the percentage of companies with a workforce with higher education. Overall, the evaluation of the digital infrastructure in BiH is unfavorable in many aspects, which is directly reflected in the level of digital transformation.

The vast majority of companies in Bosnia and Herzegovina are equipped with a fixed broadband connection. BiH companies can benefit from easy access to loans. A large number of people consider starting a business as a desirable career choice, so the promotion and support of entrepreneurship could significantly improve many aspects of the economy. A solid e-leadership rating is more a consequence of skills acquired in academia than on-the-job training provided by companies. The amount of taxes and mandatory contributions that the company pays in the second year of operation, expressed as a share of commercial profit, is quite favorable, so it could be used to attract investments, while creating a more stimulating business environment (in terms of starting a business, etc.). An increasing number of companies are turning to e-commerce, which opens up the possibility of expanding the market.

The level of technology adoption and digitization in Bosnia and Herzegovina is low, which consequently affects the country's growth potential. However, the communication and Internet infrastructure is relatively satisfactory, and the ICT sector has a tendency to grow. In this regard, BiH has the opportunity to take advantage of this, as well as the efforts of the EU through the Digital Agenda of the European Union for

the Western Balkans, and improve the presented indicators, and consequently overall social progress.

Bosnia and Herzegovina still faces significant shortcomings in most areas that are drivers of digital transformation. Commercial loans are available, but venture capital, which is very important for the development of entrepreneurship and small and medium enterprises, does not exist in the ecosystem. Furthermore, the low performance of the country in terms of the competitiveness of talents and qualified ICT experts is evident. In addition, BiH is far below the EU average in terms of the number of companies that use an ERP system that enables electronic sharing and processing of information, which is the first step towards the transformation of business to electronic business. The country is poorly positioned on the global competitiveness index, as well as according to the global talent competitiveness index.

In addition, poor results in the field of digital transformation also stem from the insufficient use of digital technologies for business purposes. Despite high DSL and broadband usage, average Internet bandwidth in the country leaves significant room for improvement. All of the above leads to the conclusion that BiH has room for improvement in each of the analyzed areas that are drivers of digital transformation. In this way, the foundation will be created for the improvement of the adoption of digital technologies and the digitization of business, which will result in a more favorable position for BiH when it comes to the integration of digital technologies, but also in the evolution of the IT start-up environment.

It is especially necessary to carry out the necessary improvement activities in the sector of small and medium enterprises, where there is no institutional framework at the state level that would support the development of these enterprises. Consequently, there is a lack of financial instruments for the promotion of innovation within small and medium-sized enterprises. Although the FBiH Government provides some financial support, the measures are mostly ineffective and do not meet the real needs of small and medium-sized enterprises (ITU). In addition, funding is divided between multiple levels of government where coordination and monitoring of implementation and effects are lacking. It is important to note that very little is used of the funds available from EU funds, probably due to the lack of qualified personnel.





**Figure 3.** Ranking of Bosnia and Herzegovina according to topics relevant to business (1-190)

Low performance in terms of supply and demand of digital skills has resulted in low innovation performance of the country. ITU (2018) states in this report that young entrepreneurs too often give up their initial venture and re-enter the regular workforce in large companies, instead of treating their initial failure as a platform for learning, personal development and improvement of the next venture. This speaks precisely to the lack of entrepreneurial culture and the already established fact that young people want to stay in their comfort zones, aiming for a job in the public sector as the best option. In other words, risk aversion is high, so it is necessary to promote entrepreneurial culture on multiple levels. Insufficient workforce with tertiary education, as well as IT personnel, results in poor e-leadership performance.

## RESEARCH DISCUSSION

By means of a comparative analysis that was carried out with several significant aspects, a broader perspective of the state of digital transformation in Bosnia and Herzegovina was obtained.

When it comes to digital infrastructure, BiH's position in terms of the number of companies using DSL or another form of fixed broadband connection is in line with the European average. However, when it comes to Internet bandwidth, BiH is much worse positioned. When it comes to the integration of business processes using the ERP system, BiH is quite low on the table, only ahead of Bulgaria, Romania, Turkey and Hungary. Finally, only Hungary is behind BiH in terms of the number of companies that use CRM to analyze customer data. In conclusion, the digital infrastructure of BiH lags behind the infrastructure of most European countries. According to official data, the situation is comparable to Bulgaria and Romania, while Hungary

is probably in a worse position. According to the UN (2020), BiH belongs to economies in transition in the category of high and middle income, while Bulgaria and Romania belong to developed economies in the category of high and middle income, and Hungary in the category of developed countries with high income.

According to innovation results, when it comes to the supply and demand of digital skills, Bosnia and Herzegovina is at the very bottom of the table, behind Bulgaria, Romania, Hungary, and even neighboring countries. Also, in BiH it is much more difficult to find people with the skills needed to fill a job than in most European countries. Behind BiH are Hungary and Romania. It is interesting that companies in Bosnia and Herzegovina generally have no difficulty in filling the positions of ICT experts, unlike many developed EU countries that are in a worse position (Belgium, the Netherlands, Finland, etc.). However, if the interpretation of this result includes the fact that a far smaller percentage of BiH companies employ IT experts at all, then it is clear that the data on difficulties in finding experts does not indicate the state of the labor market. BiH is below the European average when it comes to the number of employed persons who received a portable device that enables a mobile connection to the Internet for business use, only ahead of Cyprus and Bulgaria. In conclusion, Bosnia and Herzegovina is far behind all countries in the region when it comes to talent competitiveness, which is a very devastating fact. In addition, BiH is at the bottom of the table that ranks countries according to the percentage of employment of ICT experts, as well as the percentage of companies that have provided employees with portable devices that enable a mobile connection to the Internet for business use. All this results in a low level of innovation, and indirectly in overall social progress.

Overall entrepreneurial activity, as well as entrepreneurial intentions in Bosnia and Herzegovina are far behind most European countries. Only the situation regarding the perception of the occupation of entrepreneurs is more positive. However, although entrepreneurship is considered an attractive profession, very few people intend to become or become entrepreneurs. The reasons for this can be found in many factors, starting from macroeconomics, those related to the process of establishing companies, up to the business environment itself, but also personal characteristics of people. It can also be a consequence of the complex administrative environment that makes it difficult to open a new company, and even more difficult to close it if the venture fails.

Investment in research and development, as well as direct investments in the IT sector, are indicators according to which BiH is positioned behind most European countries. On the other hand, the total tax rate expressed as a share of commercial profit positions BiH above many developed countries, and it is easier to get a loan than in many countries. However, the availability of venture capital, as well as access to the stock market, puts BiH again at the bottom of the list, which ultimately determines access to finance as less favorable for business compared to most European countries.

Bulgaria, Romania, Greece, Lithuania, North Macedonia and Turkey are countries that are worse positioned than BiH when it comes to the number of companies that trained IT experts (e-leadership) for the development/upgrade of their IT skills. However, it is last on the list when considering the number of companies with a workforce with higher education. Finally, Bosnia and Herzegovina is close to the average of the overall situation in the EU according to the number of companies that provide their employees with portable devices for mobile internet connection. Bulgaria, Romania, Cyprus, Greece, Slovakia and Italy are behind. In other words, companies in BiH lack highly educated staff, but also trained IT staff. Overall, Bosnia and Herzegovina is in a far worse position than most European countries when it comes to driving digital transformation, and is comparable only to Bulgaria, Romania and Hungary, and in some parameters to Greece and Cyprus.

In the continuation of the paper, several more examples of comparative analysis are presented that can

be significant in interpreting the state of the level of digital transformation, as well as the drivers of digital transformation in Bosnia and Herzegovina.

According to the State Profile of Bosnia and Herzegovina at the World Bank, the political system in BiH is very complex and reflects the provisions of the constitution that were developed to end ethnic conflicts, as well as subsequent changes to the system introduced under the leadership of the international community through the Office of the High Representative. What represents the key economic challenge of BiH is the imbalance of its economic model: public policies and incentives are directed towards the public rather than the private sector, consumption rather than investment, and imports rather than exports. Bosnia and Herzegovina must develop a business environment that will attract private investments intended for SMEs and the growth of large companies. Also, it is very important to work on facilitating native performance and improving productivity, as well as creating the necessary jobs in the private sector. In order to ensure sustainability and future growth, it is necessary to address the imbalance in the economic model.

The business environment in Bosnia and Herzegovina is quite unstable. Based on the report of the World Bank, the ranking of BiH according to topics relevant to business is presented. For example, when it comes to starting a business or establishing a company, the registration procedure consists of 5 steps. In comparison with neighboring countries, Bosnia and Herzegovina is in 184th place out of 190 countries, Montenegro is in 101st position, Croatia is in 114th place. Furthermore, in terms of paying taxes, BiH is in 141st place out of 190 countries, Croatia is on the 49th and Montenegro on the 75th position. Also, BiH is in 70th position out of 190 countries when it comes to cross-border trade, while Montenegro is in 41st place.

According to the Network Readiness Index for 2020 (Portulans Institute), BiH is in the 87th position. When it comes to neighboring countries, Croatia is in 43rd place, while Serbia is in 52nd position. The Network Readiness Index is a report that ranks a total of 134 world economies based on their performance in 60 variables. Recognizing the prevalence of digital technologies in today's networked world, the index is based on four core dimensions: technology, people, governance and performance. This holistic approach means that this index covers issues ranging from fu-

ture technologies such as artificial intelligence and the Internet of Things to the role of the digital economy in achieving the Sustainable Development Goals.

The Global Connectivity Index is a report that ranks 79 countries on the S-curve chart, and maps the transformation into a digital economy. According to ICT investments, ICT maturity and digital performance related to the economy, the S-curve maps countries into three clusters (groups): Starters, Adopters and Front-runners. As of 2019, the CGI research methodology has been expanded to help policymakers understand the growing impact of artificial intelligence on the global economy. When it comes to the Global Connectivity Index for 2020, Bosnia and Herzegovina is not among the 79 leading countries. When it comes to neighboring countries, Croatia is in the 38th position, while Serbia is in the 51st position.

In addition to the above-mentioned global reports, when it comes to the Global Cybersecurity Index 2018 (ITU), Bosnia and Herzegovina is in: 118th position out of a total of 175 countries at the world level in terms of cyber security, and in the 43rd position out of a total of 46 countries at the European level in terms of cyber security. The Global Cyber Security Index (GCI) is a composite index that combines 25 indicators to measure the monitoring and comparison of countries' level of commitment to cyber security in relation to the five pillars of the Global Cyber Security Agenda (GCA). Those pillars make up the five GCI sub-indices.

The advent of digitization makes many traditional manual jobs extremely obsolete, because the demand for new types of skills (especially digital) is created, and thus the market shows the need for retraining the workforce and re-employing surplus workers. Retraining the workforce is both a priority and a challenge in many countries. Countries face the risks that existing jobs will become obsolete, some jobs will undergo a radical redesign (for example, robotics), and new jobs will be created that require specific new skills. It is very important to create a Skills and Retraining Strategy, which is based on the needs of industrial branches, in order to reduce the impact of digital transformation. When drafting the Strategy, it is necessary to pay extra attention, and create educational programs in the areas of artificial intelligence, cyber security, and the like.

The availability of digital infrastructure is the driver of digital transformation. According to the DESI methodology, digital infrastructure includes: internet con-

nection availability, Internet bandwidth, business integration using ERP software packages, and the use of CRM systems. Compared to other European countries, Bosnia and Herzegovina is at the bottom of the table when it comes to the indicator of digital infrastructure. Although it is highly ranked according to the number of companies using the Internet, the bandwidth of Internet connections lags behind most European countries, and a very small percentage of companies use ERP to integrate business processes and CRM to analyze customer data.

The construction of digital infrastructure should be one of the priorities, which is why investments are necessary to finance research, development and commercialization of digital technologies, but also to build digital skills and capabilities of the workforce, and to implement existing and new digital solutions in companies, government institutions and society at large. at all levels.

The COVID-19 pandemic has forced many businesses to go through an accelerated process of digital business transformation. New trends in digital transformation, such as robotics, blockchain, big data, internet of things, and the like, have the potential to drive innovation and improve overall company performance. The European Commission drafted an act proposing strategies for a single digital market and building Europe's digital future, which would accelerate the digital transformation of companies and ensure a fair and competitive digital economy (European Commission). Digital platforms and big data are radically transforming industries. Large amounts of data are generated through equipment, while machines and devices provide various opportunities for the development of new business models and the improvement of products and services (European Commission). Accordingly, digital platforms bring significant economic and social benefits.

Start-up Europe is an initiative of the European Commission to connect high-tech start-ups, scale-ups, investors, accelerators, corporate networks, universities and media. There are various projects and political actions funded by the EU on this issue. The initiative is fully aligned with the European Commission's Strategy for Small and Medium Enterprises (SME)<sup>1</sup> (European Commission). This strategy recognizes the different needs of SMEs. It helps them to further develop, grow, use their market opportunities, be competitive,

resilient and build self-sustainability. The goal is to increase the number of small and medium-sized enterprises engaged in sustainable development, as well as the number of small and medium-sized enterprises that use digital technologies.

Digital technologies, as advanced as they are, are just a tool. They cannot solve problems on their own, but they can enable users to realize ideas that were previously unimaginable. What is very important is that we as users have the ability to put the available tools into operation and thereby contribute to a better future.

Although there was no special focus on public and government institutions, it is clear that the BiH institutions have a long road to digitization. First of all, it is necessary to accelerate innovation in the public sector, made possible through the introduction of interoperable IT and better exchange and use of information. The strategic framework for the reform of public administration in BiH 2018 - 2022 emphasizes the importance of digitization, and establishes clear goals that guide the digitization of public administration services, as well as business. In this regard, the priority of all levels of government would be to create action plans in accordance with this strategic framework.

Based on all the performed comparative analyses, a more detailed insight into the state of digital transformation in Bosnia and Herzegovina can be provided and the key factors influencing its further development can be identified. Also, guidelines can be offered for the development of strategies and initiatives that will improve digital transformation in the country.

The key guidelines, based on certain analyses, which relate to the development of strategies and initiatives are:

- Create a strategy and action plan for digital education that would be aligned with the European Union's plan to support the sustainable and efficient adaptation of the education and training systems of EU member states to the digital age;
- Create a program to strengthen digital skills (digital literacy) in society as a whole with an increased focus on young people in order to strengthen digital skills for early career transition;
- Increase digital literacy and the proliferation of digital skills, in order to fill the gap between demand and supply of ICT professionals;
- Create a Skills and Retraining Strategy, which is based on the needs of industrial branches;

- Support for lifelong learning in order to enable the retraining of citizens (especially the population at risk of unemployment) and equip all citizens with the digital and cognitive skills they need for success in the future business context (dual education, support for short educational cycles - BiH Qualification Framework);

- Encouraging cooperation between government institutions, universities, corporations and small and medium-sized enterprises (eg financing of joint facilities for important infrastructure);

- Creating a plan and program for strengthening the digital infrastructure in Bosnia and Herzegovina.

- Stimulating private investments in digital infrastructure (through, for example, tax breaks on investments in IT);

- Encouraging a safe and reliable Internet environment for users and operators, based on strengthened European and international cooperation in responding to global risks;

- Create a strategy for a single digital market and building Europe's digital future, which would be harmonized with the EU Cyber Security Strategy for the Digital Decade, the Act on Digital Services and the Act on Digital Markets, as well as other acts related to this area;

- Develop a strategy for the development of small and medium-sized enterprises (SMEs) to help them develop and be competitive in the market;

- Establish education programs for owners and managers of small and medium-sized enterprises with the aim of increasing awareness and knowledge about digital technologies in business.

Also, it is important to note that most of the recommendations are intended for relevant government institutions, and for individual companies and institutions that aim to promote digitization in BiH. It is suggested that government institutions of all levels in Bosnia and Herzegovina devote themselves to these issues and start implementing the proposed activities that will stimulate the digitization of companies in Bosnia and Herzegovina, as well as public administration.

Recommendations for digital development in Bosnia and Herzegovina:

- Adoption of a National Strategy for Digital Transformation: Formulation and adoption of a coherent national strategy that will guide digital efforts across the country.



- Incentives for the IT sector: Introducing incentives for domestic and foreign investments in the IT sector, including tax breaks and support for startups.
- Infrastructure projects: Investment in broadband Internet and other critical IT infrastructure across the country to ensure universal availability and affordability.
- Regional cooperation: Encouraging regional cooperation with other countries in the region to exchange knowledge and resources in the field of digital transformation.

These recommendations can help BiH accelerate its digital development, encourage innovation and increase its competitiveness on the international level.

## CONCLUSION

The development of the information society and the digital economy makes adjustments in all segments of human life, especially affecting the way of life, work, connection, and social connection of an increasing part of the population around the planet. When it comes to the digitization of activities within the social and economic environment of people, the positive aspects are reflected in a greater degree of transparency of business activities; then the concept of freedom of speech is improved by reducing and practically preventing censorship of both the media and individuals; increasing the effectiveness and efficiency of the exchange and distribution of information and data between individuals, groups and organizations; and increasing the effectiveness and efficiency of administrative and bureaucratic procedures both for individuals, private companies and public company services.

Based on research findings, analysis, as well as visible indicators that the process of applying modern technologies brings with it, the conclusion emerges that digitization brings not only numerous but also profound changes, both in business and in other segments of social life. The trend of adopting digital transformation strategies in the corporate segment encourages all companies to focus more strongly on improving their business.

It can be seen that digitization includes the concepts of sustainable development. Therefore, it is necessary to consider all aspects of their application, as well as to constantly evaluate business processes in order to determine when and which technologies need to be ap-

plied. Furthermore, with technological solutions that include virtual reality and visualization, the positive side includes more effective and efficient implementation of business processes; more effective and timely business decision-making is enabled; enables people with disabilities to perform tasks that they could not do before the application of technology. Digitization of business and the application of digital technology have a positive effect on the efficiency and profitability of businesses in Bosnia and Herzegovina, as well as society in general. Through dynamic development, the digital economy erases the previous boundaries between the traditional and modern economy, between the resource-based economy and the knowledge economy, i.e. economies based on bits and bytes.

The aim of the research of this paper is to investigate the meaning, characteristics, role and function of digitization and digital transformation in the European Union with reference to business operations within Bosnia and Herzegovina. Through a review of the current literature in the mentioned field, the advantages that digital business brings in modern times have been confirmed, but its crucial role in the present time on the territory of Bosnia and Herzegovina has also been argued. Through this work, the key goal of the digitization process was pointed out, both for the business operations of the company, and for the overall development of Bosnia and Herzegovina, through the application of the development strategy of the European Union, then socially responsible business and sustainable development were defined; the implementation of sustainable development in the company's operations is described, as well as the very importance of digitalization in the innovative processes of companies in the territory of Bosnia and Herzegovina.

Thanks to the advantages of the single digital market, the European economy will once again become competent and successful in the world. The initiative itself promotes technology as a "driver of economic growth and development, creation of new jobs, sustainability and social inclusion across borders and in all European member states."

Digital technologies significantly affect the way of life, work, connections and social interaction of a growing part of the population. Digital transformation refers to profound changes that occur in all sectors of the economy and society, as a result of the introduction and integration of digital technologies into every

aspect of human life. Bosnia and Herzegovina has set digital transformation as one of its priorities in the coming period because it is a prerequisite for raising the competitiveness of the economy, but also for improving a number of other processes that are crucial for Bosnia and Herzegovina on its European path.

In Bosnia and Herzegovina, there is no relevant report that would present the state of digitization of business. The data presented in the paper for BiH indicate that the situation in BiH, when it comes to the digital transformation of business operations, is at a very low level compared to other European countries. Together with Poland, Hungary and Romania, BiH is at the very bottom of the business digitization scale, and from this we can conclude that the digital transformation in the EU indicates a significant digital gap between BiH society and the EU.

## REFERENCES

- [1] Anthony Jnr, B. (2021), "Managing digital transformation of smart cities through enterprise architecture—a review and research agenda", *Enterprise Information Systems*, Taylor & Francis, Vol. 15 No. 3, pp. 299–331.
- [2] Čelik, P., (2019). *Bezbednosne implikacije digitalnog poslovanja*, *Ekonomija- teorija i praksa*, godina XII, broj 4, str. 61-81
- [3] Ćuzović, Đ., Sokolović-Mladenović, S., (2014). *Globalizacija digitalne ekonomije*, *Međunarodna naučna konferencija Univerziteta Singidunum Sintez* 2014., str.144
- [4] Drucker, P. (1999). *Management Challenges for the 21st Century*, HarperBusiness, New York.
- [5] Đalić, N., Nikolić, M., Bakator, M., Erceg, Ž. (2021). *Modeling the Influence of Information Systems on Sustainable Business Performance and Competitiveness*. *Sustainability*, 2021, 13(17), 9619. <https://doi.org/10.3390/su13179619>
- [6] Imamović-Čizmić, K.,: *Digitalna ekonomija, novi koncepti takmičenja privrednih subjekata i izazovi za pravo i politiku konkurencije*, *Godišnjak Pravnog fakulteta u Sarajevu*, LXIII – 2020., s. 157–181
- [7] Kotler, P., Kartajaya, H. & Setiawan, I. (2017), *Marketing 4.0*, Hoboken, US, Moving from Traditional to Digital, John Wiley & Sons, Inc
- [8] Krsmanović, B. 2013. "Koncept digitalne ekonomije". *Novi ekonomist: časopis za ekonomsku teoriju i praksu*. Br. 15.
- [9] Krsmanović, B., (2013). *Izazovi digitalne ekonomije*, VIII Međunarodni Simpozijum i korporativnom upravljanju, Banja Vrućica
- [10] Krsmanović, B., Polić, S., *Inforacione tehnologije u računovodstvu i reviziji*, Bijeljina, 2008
- [11] Pihir, I., Tomičić-Pupek, K. and Furjan, M.T. (2018), "Digital Transformation Insights and Trends", *Proceedings of the Central European Conference on Information and Intelligent Systems*, pp. 141–150.
- [12] Shallmo, D., & Williams, C. (2017). *Digital Transformation of Business Models - best practice, enablers and roadmap*. *International Journal of Innovation Management*, 21(8), 1-17
- [13] Trkulja, M., Lojić, A. & Lončar, M (2018), *Digitalna globalizacija i marketing mega događaja*, *Poslovne studije 10 (19-20)*, pp. 135 – 151, Banja Luka, Republika Srpska, Bosna i Hercegovina, Univerzitet za poslovne studije Banja Luka,
- [14] Verhoef, P.C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N. and Haenlein, M. (2021), "Digital transformation: A multidisciplinary reflection and research agenda", *Journal of Business Research*, Vol. 122 No. July 2018, pp. 889–901.
- [15] Vučeković, M., Radović-Marković, M., & Marković, D. (2020). *Koncept digitalnog preduzeća i njegove virtualizacije*. *Trendovi u poslovanju*, 8(15), 75-82.

Received: January 19, 2024

Accepted: March 28, 2024

## ABOUT THE AUTHORS



**PhD Nataša Đalić**, assistant professor, is a professor at the Faculty of Traffic in Doboj, University of East Sarajevo, specialized field of Information Science (social aspects).

She defended her doctoral dissertation in 2022 at the Technical Faculty "Mihajlo Pupin" Zrenjanin, University of Novi Sad. She has published over 50 scientific papers, 4 of which are

on the prestigious SCI list.



**PhD Živko Erceg**, associate professor, is employed at the Faculty of Traffic in Doboj, University of East Sarajevo, specialized field of Management.

At the Faculty of Business Economics in Bijeljina, University of East Sarajevo, a doctoral dissertation was selected in 2015. He is the author of over 40 scientific papers, 3 of which are

on the prestigious SCI list.

## FOR CITATION

Nataša Đalić, Živko Erceg, *Digital Transformation as a Starter of the Creation of new Economic Business Models*, *JITA – Journal of Information Technology and Applications*, Banja Luka, Pan-European University APEIRON, Banja Luka, Republika Srpska, Bosna i Hercegovina, JITA 14(2024)1:55-68, (UDC: 330.341:005.591.6), (DOI: 10.7251/JIT2401055DJ), Volume 14, Number 1, Banja Luka, June (1-88), ISSN 2232-9625 (print), ISSN 2233-0194 (online), UDC 004