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The role of institutions in the digital transformation of companies in transitional countries

Igor Mišić[1]

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ABSTRACT
The digital transformation represents a crucial factor for the competitiveness of companies both at the local and regional, and especially at the global level. The aim of this paper is to assess the adequacy of the legislative framework in Bosnia and Herzegovina (BiH) and to compare the level of digitalization in BiH with other countries in the region. In measuring the level of digitalization, the paper utilizes the DESI index, which assesses four key areas: connectivity, human capital, integration of digital technologies by the business sector, and digital public services. The author provides an overview of the literature on the impact of institutions on digital transformation in transitional countries, as well as a critical review of current and future trends on this topic. BiH has an outdated and underdeveloped legislative framework concerning the implementation of digitalization at both the systemic and company levels, which is not aligned with modern trends. Consequently, BiH ranks among the lowest countries in Europe in terms of the degree of digital transformation compared to other countries in the Western Balkans. While the legislative framework is not the sole cause of BiH's low level of digital transformation, it represents one of the significant factors. This paper also provides recommendations to policymakers and managers on the possibilities and importance of digital transformation for companies, thus making certain contributions to the field.

[1] MSc. Ph. D. Student at the University of Banja Luka, Faculty of Economics, Bosnia and Herzegovina, e-mail address: igor.misic@ef.unibl.org (I. Mišić). Published online first 30 May 2024. Published by the Republic of Srpska Association of Economists „SWOT“, Bosnia and Herzegovina.

1. Introduction

Digital technologies have a comprehensive impact on all aspects of human life, from work and communication to social interactions. Digital transformation refers to profound changes brought about by the introduction and integration of digital technologies into all spheres of society (Shams et al., 2021). Given the significance of digital transformation for economic competitiveness, it has emerged as a strategic policy area, necessitating an assessment of its impact and identification of areas requiring policy intervention. Digital transformation represents a new, fourth industrial revolution that brings about radical changes in business models and their performance (Lorenc et al., 2020). Governments cannot ignore the immense potential of digital technologies and their progressive integration with unprecedented societal dynamics. Specifically, new technologies provide innovative tools for enhancing communication, coordination, and participation in social and political life, and their effective use will indeed shape the future of governance and democracy in the years to come (Barbosa, 2017).

Digital business transformation is included in the plans and programs of government institutions worldwide. To better understand the drivers, barriers, and determinants of the current state we are in, it is necessary to understand the regulatory, or legal framework governing this area. The fact is that seven out of eight positions of the most valuable public companies in the global capital market are occupied by digitally transformed enterprises. These are all very young companies that started as startups and today represent IT giants like Microsoft, Amazon, Facebook (Meta), Google (Alphabet), etc. (Srića, 2019).

Governments are transforming the traditional system of providing services to citizens into a digital format using information and communication technologies (ICT). ICT tools tend to increase the efficiency and effectiveness of service delivery processes. However, transitioning to digital transformation and integrating ICT with government services requires in-depth analysis and strategy to ensure a clear path for successful implementation. It is important to note that digital inclusion and providing services in electronic format involve not only the application of ICT but also other aspects that must be taken into account, primarily the reform of relevant laws. Therefore, addressing legal issues is crucial to ensure the existence of necessary regulatory frameworks that enable digital transformation while protecting citizens' rights (Nyman-Metcalf, 2017, 2019) and defining standards of "what can and cannot be done" (United Nations, 2018). ICT laws regulate citizens' interaction with ICT by providing a framework for the use, operation, and storage of information in electronic transactions, increasing citizens' trust in the validity of transactions, and protecting their privacy and security (Bhattacharjee et al., 2018).

Given that digital transformation is a crucial factor for the competitiveness of companies and economies as a whole, the European Union (EU) has prioritized the development of digital transformation (European Commission, 2023), developing policies that support the adoption of digital technologies, empowering businesses and consumers, promoting the development of digital skills, and modernizing public services.

On the other hand, there is no relevant report in Bosnia and Herzegovina (BiH) that would present the state of business digitization. The Foreign Trade Chamber of BiH has set digital transformation as one of the priorities in the upcoming period (European Commission, 2023) because it is a precondition for enhancing the competitiveness of the economy and improving a range of other processes crucial for BiH on its European path.

BiH is in the early stages of digital transformation. There are several factors that have contributed to this trend, including an unfavorable legislative framework for digital transformation. The subject of this research is the role of institutions in the digital transformation of companies in BiH. The research aims to identify key institutional factors that have the greatest impact on the implementation of digital transformation at the company level.

The author provides an overview of the literature on the impact of institutions on digital transformation in transitional countries, as well as a critical review of current and future trends on this topic. As an indicator of the degree of digital transformation of a particular country, the author used the Digital Economy and Society Index (DESI index) (European Commission, 2023). We expect this research to contribute to the literature on digital transformation and the importance of institutions in digital transformation, as well as recommendations on how to create a more favorable

institutional framework for digital transformation.

The first contribution is the analysis of the degree of development of the legislative framework on digitalization in Bosnia and Herzegovina (BiH) and its alignment with European Union (EU) regulations. A detailed analysis of the legislative frameworks at all levels of government in BiH, as well as a comparison with countries in the Western Balkans and the EU, confirms that BiH lacks a sufficiently developed legislative framework that systematically addresses the digital transformation of companies.

The second contribution is the identification of the influence of state and entity institutions on digital transformation through the reshaping of policies and regulations, promoting inclusivity and reliability, and improving the quality of governance and public services. The analysis of current laws and regulations in BiH reveals certain deficiencies in the regulatory framework that hinder digital transformation.

The third contribution is the proposal of specific measures that BiH can take to improve its performance on the DESI index, including increased investment in digital skills education, improvement of digital infrastructure to provide faster and more accessible internet, and the development of digital public administration. These measures would facilitate the use of public services by citizens and businesses, thus promoting digital transformation at both systemic and company levels.

The remainder of this paper is organized as follows. In the next section, we provide a literature review on the role of institutions in digital transformation. The following section explains the research methodology. The section after that presents empirical results followed by main conclusions, limitations, and ideas for future research.

2. Literature Review and Hypothesis Development

Industries and companies worldwide are increasingly influenced by digital transformation (Broekhuizen et al., 2021; Fitzgerald et al., 2014; Ferraris et al., 2019). It is even considered to have a positive impact on social development (Popkova et al., 2022). For this reason, digital transformation has attracted the interest of numerous researchers and practitioners over the last decade, who have sought to understand its nature and characteristics.

Vial (2019) described digital transformation as a process that generates strategic and operational changes in companies due to the opportunities and threats arising from digital technologies. Other authors highlight how digital transformation involves the adoption of the latest technologies by agile organizations, aiming for radical improvements in their performance and expanding horizons (Bresciani et al., 2021a; Kraus et al., 2021; Westerman et al., 2011). Similarly, Fitzgerald et al. (2014) present digital transformation as the practical implementation of digital technologies to improve user experience and engagement, streamline operations, strengthen business models, or generate new business opportunities. On the other hand, Apio et al. (2021) argue that providing a comprehensive definition of digital transformation is challenging because it is a multidimensional phenomenon. Despite these challenges, it is worth exploring some of these dimensions.

From a strategic perspective, Mat et al. (2015) and Broekhuizen et al. (2021) highlight the inherent complexity of digital transformation and its potential to reshape the company from organizational, operational, and business perspectives. Hess et al. (2016) examine the fundamental strategic dimensions of digital transformation and the fundamental, company-wide, strategic issues arising from digital transformation programs. In a comprehensive literature review, Kraus et al. (2021) suggested that a strategy focused solely on digital transformation is clearly insufficient, emphasizing the strategic nature of digital transformation and its inherent connections to the broader strategic ecosystem of the company.

Accordingly, digital transformation is seen as a strategic priority for most companies, prompting organizations to become more agile and rethink their business models and operational approach (Hess et al., 2016; Bresciani et al., 2021a; Ferraris et al., 2021; Kraus et al., 2021; Shams et al., 2021).

From a market perspective, digital transformation is seen as a tool for dealing with disruptions or creating disruptions - through the use of digital technologies. As a result, companies value propositions are redefined, entry barriers are lowered, and digital and physical products coexist in the market, with more or less alignment (Mithas et al., 2013; Barrett et al., 2015; Bresciani et al., 2021b). There is a clear

mutual relationship between business model innovation and digital transformation, with digital transformation leading to the reformulation and adaptation of companies' business models in various industries (D'Ippolito et al., 2019). And while digital transformation clearly changes competitive dynamics, it also generates profound changes in consumer behavior and expectations (Correani et al., 2020; Fitzgerald et al., 2014; Khanra et al., 2021; Schwertner, 2017). Therefore, although changes driven by digital transformation are naturally associated with the adoption of digital technologies and the digitization of organizations (Westerman et al., 2011; Khanra et al., 2020; Verhoef et al., 2021), its implications are not strictly limited to this aspect (Tabrizi et al., 2019; Vial, 2019).

Digitalization brings new sources of prosperity to all citizens (Deloitte, 2021), enables entrepreneurs to innovate, start, and expand businesses regardless of where they live, opens up markets and investments across Europe and the world, and creates new jobs in a period when more and more Europeans feel threatened in their economic security or environment. Government agencies and public institutions positively influence digital transformation by reshaping policies, laws, and regulations related to various public, social, regional, and national issues.

Government institutions influence digital transformation by promoting inclusivity, reliability of software infrastructure, and implementing more transparent and accountable public institutions (Barbosa, 2017).

Some Western Balkan countries have begun to implement digital transformation in healthcare, aiming to improve clinical management, enhance the quality of care, and increase patient satisfaction (Rosalia et al., 2021). Western Balkan countries have experienced increased convergence in digital transformation, but still lag behind the EU in the use of digital technologies (Baturac et al., 2020; Shahini, 2021;).

The challenge of responding to the aforementioned technological trends and remaining competitive in the face of increasing penetration of digital technologies necessitates the need for business digital transformation. Digital transformation refers to the process that begins when an organization starts thinking about introducing digital technologies in all areas of business and lasts until their full integration.

The Global Center for Digital Business Transformation defines business digital transformation as an organizational change through the use of digital technology and business models to enhance business performance (Wade, 2015). It is a continuous process that is not always straightforward, but without which business in today's world gradually becomes impossible. Popović-Pantić et al. (2019) define digital transformation as a complex, dynamic, continuous process of transforming all organizational aspects, supported by strategically designed integral application of modern digital technologies, aiming to create a new business model and position the customer at the center of all activities and decisions made by the organization, all with the goal of creating conditions for innovation improvement, better market position, and consequently, overall business performance enhancement. Similarly, Ismail et al. (2017) define digital transformation as a process through which companies converge multiple new digital technologies with the intention of achieving superior performance and sustainable competitive advantage, transforming various business dimensions, including business models, customer experience, and business operations. Numerous examples of organizations intensively using digital technologies with the aim of creating new value for customers, such as General Electric, Nike+, Netflix, Uber, Airbnb, Booking, PayPal, etc., have led to disruptive changes in many sectors of the economy, ranging from agriculture and industry, through trade, tourism, hospitality, banking and financial services, to education, science, culture, information, and healthcare.

Highlighting the importance of business digital transformation, many authors emphasize that digital technologies such as mobile devices, social networks, cloud computing, Internet of Things (IoT), and big data analytics (BDA) are used to improve customer experience, operational processes, and business models (Fitzgerald et al., 2013; Rogers, 2016). Bone et al. (2021) supplements this classification with employee experience transformation and business model transformation. As a result, customers have become the primary force driving the digital transformation of all industries (Berman et al., 2011). Bone et al. (2021) discuss experiential design, consumer intelligence, and emotional engagement as dominant elements of customer experience transformation. Transformation of enterprise operational processes covers automation of production processes, research and development, as well as distribution.

Digital technologies such as cloud computing, Internet of Things (IoT), big data analytics, increase employee capacity (Khanra et al., 2020).

Li and Wang (2021) concluded that the legal and regulatory framework can significantly promote digital transformation, while outdated or restrictive frameworks can hinder it. In their research, they also found that the specific impact of the legal and regulatory framework varies from country to country, depending on the specific laws and regulations in force.

With recent advances in ICT tools and the rapid spread of digital transformation, reform of relevant laws has become a primary condition for easier introduction of e-government and improvement of efficiency and use of government services (Sarantis, 2017). Therefore, technological tools are not the only factor in government transformation. Hence, laws relevant to ICT are needed to regulate the availability and usability of technologies in providing government services in electronic format, give legal validity to electronic communications, and ensure the success of e-government adoption (Albrecht & Novak, 2021; Garad & Qamari, 2021). A United Nations study from 2018 focused on the legal framework for digital transformation. The study also touched on cybercrime laws and explained them as legal measures that enable governments and other interested parties to define basic mechanisms for responding to cyber-attacks, including e-government systems (United Nations, 2018).

Lentner and Parycek (2016) explored the e-government component from a technical perspective and considered that electronic identity (eID) and electronic signature are key factors for identifying subjects in the digital environment. However, laws ensuring the authenticity and legal validity of subjects and signatures during online communication are necessary to be adopted and implemented. Khan et al. (2020) analyzed 83 countries and found that the existence of ICT laws is significant for achieving broader diffusion of ICT and their use among citizens and improving welfare. They concluded that since ICT law regulates and protects against misuse during electronic transactions through ICT standards, it increases citizens' trust in using ICT and online services over the internet, ensuring the protection of their data, privacy, and security. They also noted that more mature ICT laws positively impact ICT diffusion in the country and increase citizens' intention to use them (Khan et al., 2020).

Glyptis et al. (2020) noticed that the existence of a legal framework ensures the success of e-government adoption by the country, as laws define the legal basis and way of implementing the digital transformation process. Also, Wierzbowski et al. (2021) claimed in their work that the implementation of the regulatory framework in practice is a key aspect that governments must improve when transforming into an e-state and providing government services in digital formats and implementing e-government systems. With the digital revolution and the introduction of digital currencies, blockchain, and distributed ledger systems, Silva (2020) argues that the legal framework is crucial for providing "legal certainty of the process" and mitigating relevant issues for data integrity, data protection, data privacy, and information security in the digital environment. Based on the above, we have come to the following research question:

RQ: To what extent are the institutional factors in Bosnia and Herzegovina favorable to fostering digital transformation among companies and the entire society, and how does this impact the competitiveness of the country?

3. Methodology

The research was implemented through the following steps:

1. Relevant laws and regulations in the country were identified. This includes laws and regulations related to electronic communications, electronic commerce, electronic signatures, data protection, and other relevant areas.
2. The laws and regulations were analyzed to determine the extent to which they support the digital transformation of businesses and society. This involves considering factors such as the clarity of the laws, the level of regulatory burden, and the extent to which the laws promote innovation.
3. Next, the frequency of internet usage, the percentage of individuals making online purchases, the number of businesses with functional websites, and the percentage of individuals with basic or average digital skills in Bosnia and Herzegovina

were analyzed, and these data were compared with data from Western Balkan countries and the European Union (EU) average.

To monitor the progress of digital performance and digital competitiveness of EU member states, the European Commission launched the Digital Economy and Society Index (DESI) in 2014 (European Commission, 2023). DESI measures four key areas: connectivity, human capital, integration of digital technologies by the business sector, and digital public services. As candidates or potential candidates for EU membership, Western Balkan economies are required to use the Digital Economy and Society Index (DESI) indicators to measure progress achieved (European Commission, 2023). The Regional Cooperation Council has published a report providing an overview of the implementation of the DESI index methodology in the Western Balkans, as well as the availability of data sets for calculating all DESI indicators and identifying responsible institutions for data collection (European Commission, 2023). It is also important to note that it is necessary to harmonize the methodology of a certain number of indicators with EU methodologies (Jordanoski et al., 2021).

The European Commission has developed a set of indicators to measure progress towards these goals. These indicators include:

- Connectivity: Percentage of households with access to fixed and mobile broadband internet, percentage of households with gigabit internet connection;
- Digital Skills: Percentage of population aged 16 to 74 with at least basic digital skills;
- Business Use of Digital Technologies: Percentage of enterprises using cloud computing services, percentage of enterprises using artificial intelligence (AI);
- Digitalization of Public Services: Percentage of key public services available online, percentage of users of public services using online services. (European Commission, 2022, p. 4)

Table 1
DESI Index Indicators

DESI	**DESI Index Indicators**
Connectivity	Gigabit for All (Coverage of very high-capacity fixed network).
	Coverage of 5G network.
Digital Skills	Basic digital skills
	ICT specialists.
	Female ICT specialists
Integration of Digital Technologies	SMEs with basic level of digital transformation
	AI
	Cloud
	Big Data
Digitalne javne usluge	Digital services for citizens
	Digital services for businesses

Notes: The table lists elements and indicators of the DESI index (European Commission, 2023).

Progress in the field of electronic communications and information society in Bosnia and Herzegovina is monitored by three institutions:

- The Agency for Statistics of Bosnia and Herzegovina (BHAS);
- The Regulatory Agency for Communications of Bosnia and Herzegovina (RAK);
- The Ministry of Communications and Transport.
- There is no identified overlap or gap regarding the jurisdiction of entity authorities and joint-level authorities in Bosnia and Herzegovina, as all DESI indicators are assigned to the responsible institution for monitoring and data collection.

The Agency for Statistics of Bosnia and Herzegovina (BHAS) conducts international representation and collaboration with organizations and other bodies and fulfills Bosnia and Herzegovina's international statistical obligations. It also collects, processes, and distributes statistical data for Bosnia and Herzegovina in accordance with internationally accepted standards. As the statistical agency of Bosnia and Herzegovina, BHAS is responsible for collecting data for 27 DESI indicators. For this purpose, BHAS closely cooperates with the Federal Institute of Statistics (FIS) and the Republic Institute of Statistics of Republika Srpska (RIS).

Progress in the field of electronic communications and the information society is monitored by BHAS through four statistical operations:

- Survey on the use of ICT in households and by individuals;
- Survey on the use of ICT in enterprises;
- Labour Force Survey (LFS); and
- Administrative data on education.

BHAS is responsible for collecting data related to electronic communications and the information society. These data are used to monitor Bosnia and Herzegovina's progress in these areas and to assess its alignment with the EU acquis. BHAS has achieved a high level of alignment with Methodological Guides and Model Questionnaires (MQ) for surveys on the use of ICT in households and by individuals and surveys on the use of ICT in enterprises. Data for both surveys are transmitted and available in Eurostat's database and can be used in the context of calculating DESI for Bosnia and Herzegovina.

BHAS has reported that the harmonization process with EU-LFS is not yet completed, and data for Bosnia and Herzegovina are not transmitted to Eurostat. To fill this gap, BHAS has included DESI indicators for ICT professionals in employment in the survey on the use of ICT in enterprises.

The national regulator, the Communications Regulatory Agency of Bosnia and Herzegovina, is responsible for monitoring and collecting data for seven DESI indicators, all in the connectivity dimension. RAK also collects data for indicator 1a1, but the data used for calculating DESI are those collected by BHAS and reported to Eurostat. There is no overlap between RAK and BHAS because the DESI methodology clearly defines which data are used to calculate DESI for each indicator. RAK publishes annual reports on the development of the electronic communications market.

Regarding the Connectivity dimension, RAK has achieved a high level of alignment with the data collection process and methodological alignment for three DESI indicators. Currently, RAK is unable to collect data for these indicators due to limited resources, capacity, and methodological challenges (Regional Cooperation Council, 2021)..

According to the Policy for the Development of the Information Society of Bosnia and Herzegovina 2017-2021, the Ministry of Communications and Transport is authorized to coordinate and monitor the development of the information society and to collect data for four DESI indicators. Unfortunately, Bosnia and Herzegovina was not included in the eGovernment Benchmark Report 2020 and the Open Data Maturity Report 2020 (Regional Cooperation Council, 2021). Since the Ministry of Communications and Transport in the Council of Ministers of Bosnia and Herzegovina is obliged to monitor the development of the information society, it expresses readiness to participate in both studies at the European or regional level.

Regarding the availability of statistical data on digital performance and digital competitiveness in the context of DESI, Bosnia and Herzegovina is moderately prepared, with data available for 73% of DESI indicators aligned with the DESI methodology. However, data for 27% of indicators are still not available (Regional Cooperation Council, 2021).

Connectivity

Data collection and monitoring the development of Connectivity dimension is the responsibility of BHAS (one indicator) and RAK (seven indicators). Full alignment with DESI Methodology is achieved for four

of eight indicators. Data for three of these indicators (1a2, 1c1, and 1c2) are collected by RAK and are fully aligned with DESI define tions and methodology. Data for 1a1 indicator is collected by BHAS and is already published in the Eurostat database. Data for 5G readiness indicator (1c3) is not avail - able as the process for review and adoption of new regulations for 2020-2022 has not been finished yet. The inclusion of three spectrum bands will set a base for the calculation of 5G readiness indicator.

Data for four indicators (1b1, 1b2, 1c3 and 1d1) are not available as neither Bosnia and Herzegovina is included in the Commission ad hoc studies nor RAK collects data for these indicators. As all of them derive from the Commission ad hoc studies, RAK expressed readiness to participate in these studies (on a European or regional level). Currently, RAK is not in a position to collect data for these indicators due to its limited resources, capacities and methodological difficulties.

Digital Skills

Data collection for Human Capital dimension is the responsibility of BHAS (six indicators). Full alignment with DESI Methodology is achieved for five of six indicators. Data for three indica - tors (2a1, 2a2 and 2a3) derive from the ICT us - age in households and by individuals survey and are available on Eurostat for the last reported year (2019).

Data for two indicators (2b1 and 2b2) are also available but are not collected through the LFS. To fill the gap, BHAS collects data for these indicators through the ICT usage in the household survey using the International Standard Classification of Occupations (ISCO) classification (ISCO-08) on which occupations will be treated as ICT specialists.

Data for the ICT Graduates indicator (2b3) is not available neither in the BHAS database nor the Eurostat. As administrative data, it is available only at the entity level. The data could be available at the BHAS request to the entity statistical institutions, which will take further action to collect data from administrative sources.

Internet Use

Data collection for the dimension of Internet use is the responsibility of BHAS (for eleven indicators). Domestic methodology and questionnaire are aligned with Eurostat's methodological manual and guidelines for surveys on the use of ICT in households and by individuals, and are adjusted annually.

Full compliance with the DESI methodology has been achieved for all eleven indicators. Data for all indicators for the last reported year (2020) have been transmitted and are available in Eurostat's database.

Digital Public Services

Data collection and monitoring of the development of the dimension of Digital Public Services is the responsibility of BHAS (for one indicator) and MKT (for four indicators). Full compliance with the DESI methodology has been achieved for one out of five indicators.

Data for one indicator (5a1), for the last reported year (2020), are collected by BHAS and stem from surveys on the use of ICT in households and by individuals. Data for this indicator for the last year (2020) have been transmitted and are available in Eurostat's database.

Data for the other four indicators (5a2, 5a3, 5a4, and 5a5) are not available because Bosnia and Herzegovina was not included in the latest eGovernment Benchmark Report 2020 and Open Data Maturity Report 2020. Since MKT is authorized to monitor four DESI indicators in the dimension of Digital Public Services, MKT has expressed readiness to participate in the study at the European or regional level. Currently, due to limited capacity, MKT is unable to collect data for these indicators.

4. Results of the Research

Legislative Framework of Bosnia and Herzegovina

Bosnia and Herzegovina (BiH) has a very complex governance system, consisting of two entities (Republika Srpska - RS and the Federation of Bosnia and Herzegovina - FBiH), ten cantons within the FBiH, and one autonomous district (Brcko District), each with its own laws and jurisdictions. This complexity can sometimes lead to situations where different laws exist for the same issue at different levels of authority. For example, in the case of electronic signatures and electronic documents, there are laws enacted at the state level, entity level, and Brcko District level. This complexity can be challenging for citizens and entrepreneurs who need to know which law applies in their case. It can also hinder the process of enacting and implementing new laws.

By adopting the Policy for the Development of the Information Society of Bosnia and Herzegovina for the period 2017–2021 (2017), BiH clearly defined its strategic commitment to the development of the information society and the improvement of information security within its territory. Despite its highly complex structure, BiH has enacted a number of laws and strategic documents aimed at promoting and improving e-business. However, the implementation of these documents and laws is proceeding very slowly, significantly limiting the digitalization and e-business of small and medium-sized enterprises. The reason for this is the complexity of BiH's legal system, characterized by unclear jurisdictions between different levels of government. This leads to the enactment of different laws for the same area at different levels of government, making it difficult for citizens and businesses to know which law applies in their case.

Regarding jurisdictions, the Ministry of Communications of BiH is responsible for enacting legislation in the field of digitalization. Although this ministry is responsible for enacting laws in the field of digitalization, the application of enacted laws is often limited or not possible due to the complexity of BiH's governance system, as exemplified by the Law on Electronic Signature in BiH and the Law on Electronic Document in BiH.

The following laws have been enacted at various levels of government in recent years, pertaining to the degree of digital transformation in BiH:

- Law on Electronic Signature in BiH ("Official Gazette of BiH" No. 91/06);
- Law on Electronic Legal and Business Transactions in BiH ("Official Gazette of BiH" No. 88/07);
- Law on Electronic Document in BiH ("Official Gazette of BiH" No. 58/14);
- Law on Electronic Business of Republika Srpska ("Official Gazette of Republika Srpska" No. 59/09);
- Law on Electronic Document, Electronic Identification, and Trust Services in Electronic Business in Republika Srpska ("Official Gazette of Republika Srpska" No. 94/2017);
- Law on Critical Infrastructure ("Official Gazette of Republika Srpska" No. 87/2018);
- Law on Information Security ("Official Gazette of Republika Srpska" No. 70/2011);
- Law on Tax Procedure ("Official Gazette of Republika Srpska" No. 78/2020);
- Law on Electronic Document of FBiH ("Official Gazette of FBiH" No. 55/2013);
- Law on Electronic Signature of FBiH (draft adopted in the House of Peoples of FBiH on 27.02.2020).

Subsidiary regulations governing the above are as follows:

At the BiH level:

- Regulation on the Payment of Indirect Taxes and Other Revenues and Fees Collected by the Indirect Taxation Authority of BiH ("Official Gazette of BiH" No. 21/20 of April 30, 2020);
- Decision on Determining the Price of Services for Issuing and Using Qualified Electronic Certificates ("Official Gazette of BiH" No. 78/20 of December 4, 2020).

At the level of the Federation of Bosnia and Herzegovina:

- Regulation on the Procedure for Submitting Tax Returns ("Official Gazette of FBiH" No. 66/02, 54/03, 74/04, 38/09, 7/11, 53/12, and 87/20);
- Regulation on the Application of the Law on Corporate Income Tax ("Official Gazette of FBiH" No. 88/16, 11/17, 96/17, 94/19, and 87/20);
- Regulation on the Submission of Applications for Registration and Changes in Registration in the Unified System of Registration, Control, and Collection of Contributions ("Official Gazette of FBiH" No. 73/09, 38/10, 77/10, 9/11, 1/13, 83/14, 1/15, 48/16, 25/17, 53/19, and 93/19).

At the level of Republika Srpska:

- Regulation on the Procedure for Registration and Identification of Taxpayers ("Official Gazette of Republika Srpska" No. 94/2017).

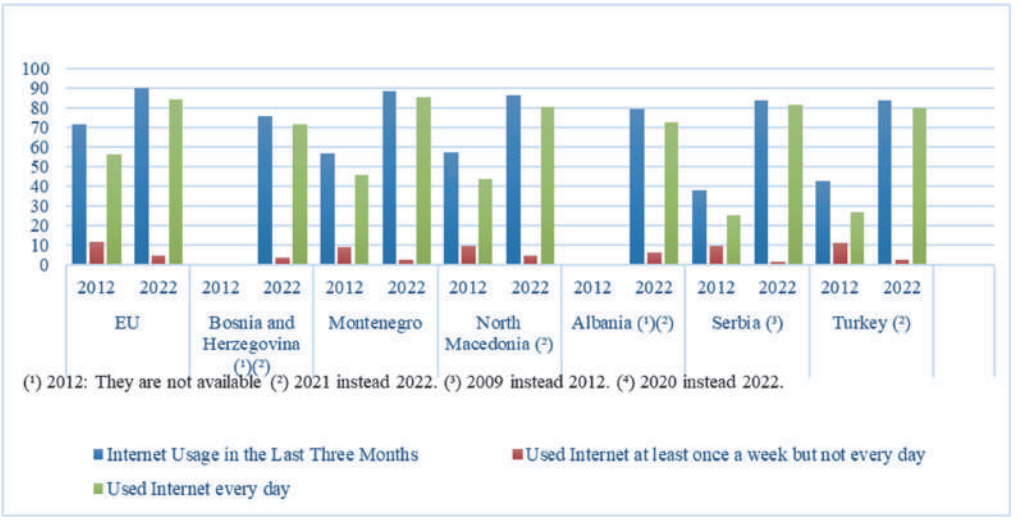
Strategic documents at the level of Bosnia and Herzegovina include:

- Policy for the Development of the Information Society of BiH for the period 2017–2021 ("Official Gazette of BiH" No. 42/17);
- Policies for Information Security Management in BiH Institutions for the period 2017–2022 ("Official Gazette of BiH" No. 38/17);
- eSEE Agenda + (Directorate for Economic Planning, Council of Ministers of BiH, 2015);
- Strategic Framework for BiH (Directorate for Economic Planning, Council of Ministers of BiH, 2015).

Results of the Level of Digitalization of Western Balkan Countries with a Special Focus on Bosnia and Herzegovina

Graph 1

Frequency of Internet Usage, 2012 and 2022 (% of individuals aged 16 to 74)



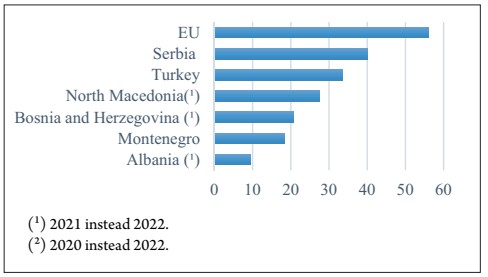
Notes. Eurostat (online data codes: isoc_ci_ifp_iu and isoc_ci_ifp_fu).

As shown in Graph 1, the frequency of internet usage among individuals aged 16 to 74 has significantly increased between 2012 and 2022. The results shown in the graph indicate that Bosnia and Herzegovina has made significant progress in the area of internet usage over the past ten years. However, there is still room for improvement, as the share of individuals using the internet is lower than the European average. In the context of Bosnia and Herzegovina, there are several key factors that have contributed to the increase in the proportion of individuals using the internet across all age groups. One of the most important factors is the development of information and communication technologies (ICT) in the country. Over the past decade, there has been a significant improvement in internet availability in Bosnia and Herzegovina, both in urban and rural areas. Additionally, the costs of internet access have decreased. Another important factor contributing to the increase in internet usage is the raising of awareness about the benefits of internet usage.

Over the past ten years, more and more people in Bosnia and Herzegovina have become aware of the benefits that the internet can offer, such as access to information, communication, education, and employment. Although Bosnia and Herzegovina has made significant progress in internet usage across all age groups, there is still room for improvement. One of the priorities in this area should be improving internet availability in rural areas. Additionally, efforts should continue to raise awareness about the benefits of internet usage, especially among the age group of 65 and older. The following graph shows the percentage of individuals purchasing goods and services online in the last three months prior to this survey, in six countries in the Western Balkans region in 2022.

Graph 2

Individuals purchasing goods and services online, 2022 (% of individuals aged 16-74)



Notes. Eurostat (online data code: isoc_ec_ib20).

As shown in Graph 2, the percentage of individuals aged 16 to 74 purchasing goods and services online in 2022 is significant. The main trends identified in the graph are as follows:

The highest percentage of individuals purchasing goods and services online in the Western Balkans is in Serbia, at 40%.

The lowest percentage of individuals purchasing goods and services online in the Western Balkans is in Albania, below 10%.

In Bosnia and Herzegovina, 20.7% of surveyed individuals bought goods and services online, significantly lower than the EU average of 56.1%.

The results depicted in the graph indicate that e-commerce is evolving in all countries in the Western Balkans region. However, there is still room for improvement, as the share of individuals purchasing goods and services online in Bosnia and Herzegovina is lower than the European average.

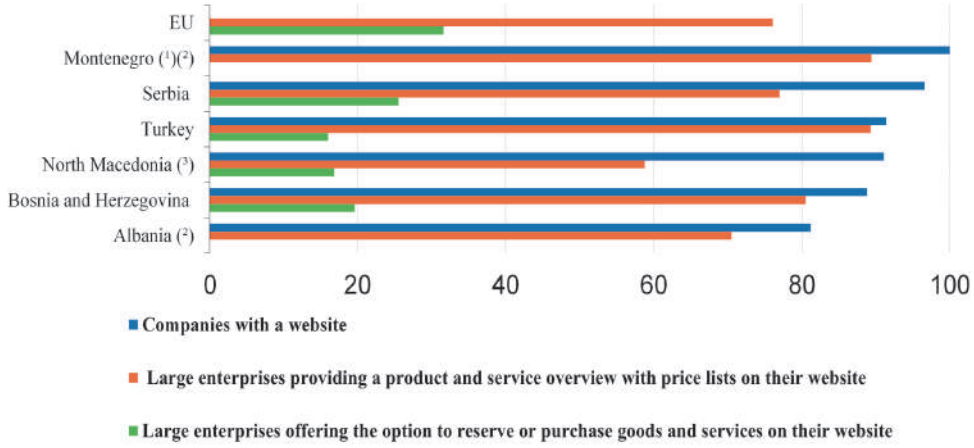
An important factor that could contribute to increasing the share of individuals purchasing goods and services online is raising awareness about the benefits of e-commerce. Over the past decade, more and more people in Bosnia and Herzegovina have become aware of the advantages that e-commerce can offer, such as access to a wider range of products and services, competitive prices, and the convenience of shopping from the comfort of their homes.

Although Bosnia and Herzegovina has the potential for e-commerce growth, certain measures need to be taken to harness this potential. One priority in this area should be improving internet accessibility in rural areas. Additionally, efforts to raise awareness about the benefits of e-commerce need to continue.

The following graph depicts the percentage of businesses with a functional website in six countries in the Western Balkans region in 2021.

Graph 3

Businesses with a functional website in 2021 (%)



(1) Large enterprises where the website provided description of goods or services, price lists: 2019 instead 2021.
(2) Large companies that offer the possibility of booking or purchasing goods and services on the website are not available
(3) Large companies that provide the possibility to reserve or purchase goods and services on their website: 2020 instead of 2021.

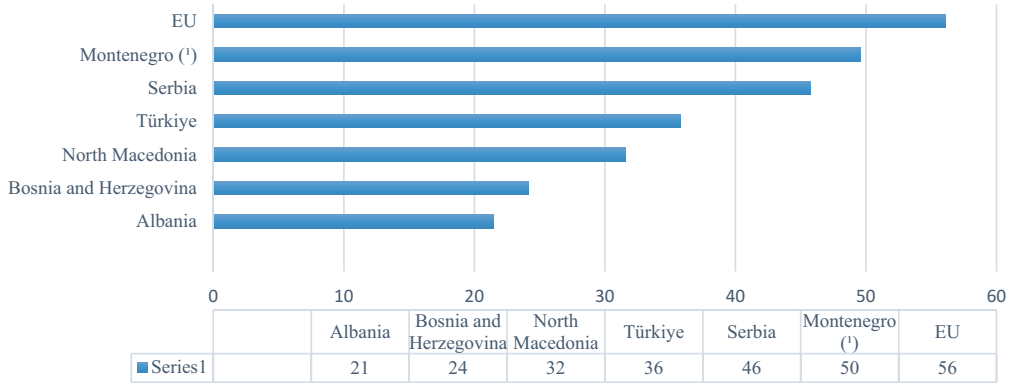
Notes. Eurostat (online data code: isoc_ciweb).

As shown in Graph 3, the percentage of businesses with a functional website in 2021 is noteworthy. All Western Balkan countries lag behind the EU in the percentage of companies that have the option of booking or purchasing goods and services on their website. One of the reasons that follows from the previous ones is the unregulated legal framework.

The following graph shows the percentage of individuals with basic or average digital skills in six Western Balkan countries in 2019.

Graph 4

Individuals with basic or average digital skills, 2019 (%)



Notes. Eurostat (online data code: isoc_sk_dskl_i).

As shown in Graph 4, the percentage of individuals with basic or average digital skills in 2019 is significant. In all countries in the Western Balkans region, the percentage of individuals with basic or average digital skills exceeds 20%. The highest percentage of individuals with basic or average digital skills is recorded in Montenegro, while the lowest is in Albania.

Currently, Serbia is the best-prepared economy in the Western Balkans that can provide data for all 37 DESI indicators, followed by Montenegro and North Macedonia (34 indicators), Albania (32 indicators), and BiH (27 indicators). In the context of DESI, the alignment of available data with DESI and other methodologies is also crucial. Serbia is also a leader among Western Balkan economies capable of providing methodologically aligned data for 36 out of 37 DESI indicators, followed by North Macedonia (32 indicators), Montenegro (28 indicators), Albania, and BiH (27 indicators).

However, the analysis has shown that data is still missing for five out of six Western Balkan economies, while all six economies need to make additional methodological adjustments. Montenegro, with a score of 35.1, has the highest DESI index, followed by Serbia with 34.9 points, Albania with 32 points, followed by North Macedonia with 27.4 points, Kosovo* with 26.1 points, and BiH with 23.2 points.

5. Discussion

It can be concluded that the state of digitalization - or digital transformation in Bosnia and Herzegovina (BiH) is such that it lags behind both EU countries and countries in the region. Although digital technologies are transforming the global economy, BiH has not yet experienced all the developmental benefits of digital technologies, such as inclusive and sustainable growth, improved governance, and rapid delivery of services. BiH is at risk of slow or poor adoption of these innovations, which can have adverse consequences for the economy, government, non-governmental sectors, and individuals, or the country as a whole. A faster and better response from regulators and all levels of government and entities is expected to stimulate, rather than slow down - or even halt - technological progress. The legislature needs to make additional efforts and work to improve regulations related to the use of digital signatures, the use of cloud services, data protection, access to data registries, and the like, all with the aim of aligning the regulatory framework with global trends.

The transformation of customer experience regarding products and services of an organization indicates that digital technologies are changing the way companies create value for their customers. In the digital era, customers are networked and interact with each other, thus changing their relationship with a particular business, as well as with each other. Customers today are constantly connecting with each other and influencing each other, shaping the reputation of different businesses and brands. Their use of digital tools changes how they discover, evaluate, purchase,

and use products, as well as how they share, interact, and stay connected with brands. With increasing access to online information, along with numerous choices and channels available to them, customers have become more powerful and their expectations higher. These studies suggest that government institutions influence digital transformation by reshaping policies and regulations, promoting inclusivity and reliability, and improving the quality of governance and public services, considering various organizational, legal, and social factors.

BiH and Serbia have a similar legislative framework for digital transformation. Both countries have laws and regulations that support electronic communications, e-commerce, electronic signatures, and data protection. However, there are some key differences between the legal frameworks of the two countries. BiH has a fragmented legislative framework, with different laws and regulations applying at the state, entity, and district levels. This can make it difficult for businesses and individuals to use digital technologies across borders. Serbia, on the other hand, has a more centralized legislative framework, making it easier for businesses and individuals to use digital technologies throughout the country.

Despite differences in legislative frameworks, BiH and Serbia have similar levels of digitalization, according to the DESI index. This suggests that the legislative framework is not the sole factor determining the level of digitalization in a country. Other factors, such as the availability of infrastructure, the level of education and skills, and the cultural acceptance of digital technologies, also play an important role.

BiH is a candidate for EU membership, as are other Western Balkan countries. As a candidate country, it is constantly under monitoring by the European Commission, which has also noticed that BiH is in the early stages of preparation in the field of the information society and audiovisual media (Chapter 10), recommending the adoption of laws on electronic communications and electronic media in line with the EU acquis (Regional Cooperation Council, 2021); completing the second phase of digital transition and adopting a strategic framework for access to broadband internet network; and adopting laws on electronic identity and trust services for electronic transactions with a single supervisory authority for the entire economy in line with the EU acquis (Regional Cooperation Council, 2021).

In order to simplify the legal system and promote e-business, it is necessary to consolidate all regulations in BiH into a single database, regardless of the level of government. This database should be available online so that citizens and businesses can easily find relevant regulations.

Globally, information and communication technologies (ICTs) have become a strategic tool and enable innovations in the public sector, companies, and productivity growth. Digital technologies enable governments to operate efficiently and effectively, providing user-oriented services and public value, but also fundamentally transforming the way the public sector operates. Digital transformation brings both socio-economic opportunities and challenges.

BiH has the potential for further improvement in its DESI index score. This can be achieved through further development of digital skills of the population, investment in digital infrastructure, and improvement of digital public administration. If BiH takes these measures, it can significantly improve its DESI index score and move closer to the European average.

6. Conclusion and Implications

Digitalization, as a modern phenomenon, impacts all segments of society, bringing various opportunities as well as challenges. The aim of this study was to determine the role of state and entity institutions in the digital transformation of companies. In this paper, the degree of development of the legislative framework on digitalization in Bosnia and Herzegovina (BiH) and its alignment with EU regulations were analyzed. After a detailed analysis of the legislative frameworks at all levels of government in BiH and comparison with countries in the Western Balkans and the EU, the hypothesis was confirmed that BiH lacks a sufficiently developed legislative framework that addresses digital transformation at the systemic level and within companies. State and entity institutions influence digital transformation by reshaping policies and regulations, promoting inclusivity and reliability, and improving the quality of governance and public services, taking into account various organizational, legal, and social factors. The analysis of current laws and regulations in BiH identified certain deficiencies in the regulatory framework that hinder the digital transformation of BiH. The current Law on Electronic Signature in BiH is aligned with Di-

rective 1999/93/EC, but it needs to be harmonized with Regulation 910/2014 of the European Parliament and Council. Since the EU recognizes only supervisory authorities at the state level, regulations need to be harmonized at lower levels of government as well; otherwise, an electronic signature issued based on entity laws would not be usable beyond the borders of BiH.

6.1. Theoretical Implications

Research on the impact of institutions on digital transformation in developing countries, with a special focus on Bosnia and Herzegovina, has led to new theoretical insights. Effective legal and institutional frameworks regulate and protect against misuse during electronic transactions, increase citizens' trust in the use of digital technologies, as well as the protection of their data, privacy, and security. Quality legal frameworks also contribute to faster development and e-governance by providing the legal basis and implementation processes for digital transformation. Transition countries, including those in the Western Balkans, need to strengthen their level of digital transformation to enhance competitiveness at both national and regional levels.

6.2. Implications for Policies and Managers

Research has shown that digital transformation can improve the efficiency, transparency, and accountability of governments, as well as stimulate innovation and economic growth. However, it can also affect social inequalities, workforce displacement, and security risks. Bosnia and Herzegovina, in particular, need to work on improving the efficiency and transparency of regulatory and legislative bodies to enhance digital transformation. Specific measures that Bosnia and Herzegovina could take to improve its performance on the DESI index include increased investment in digital skills education, improvement of digital infrastructure to provide faster and more accessible internet access to the population and economy, and the development of digital public administration to facilitate the use of public services by citizens and businesses. The results of the research imply that governments in transition economies, including institutions in Bosnia and Herzegovina, need to continue promoting support for digital transformation at both systemic and company levels through tax and customs incentives for companies that digitize, as well as through the promotion and support of digital transformation for companies transitioning from linear to circular economy models.

A higher level of digital transformation in companies improves customer experience and engagement, streamlines operations, innovates components or entire business models, increases efficiency and cost-effectiveness, and generates new business opportunities. While a strong connection between the level of digital transformation and company profitability has not yet been established, there is a strong correlation between the level of digital transformation and the value of those companies, as seen in the case of the world's most valuable companies.

6.3. Limitations of the Study and Recommendations for Future Research

Digital transformation is a relatively new research topic, and there is still much we do not know about this process. Theoretical frameworks for understanding digital transformation are still evolving. Research on digital transformation is very specific due to its multidisciplinary nature. It usually involves various interactions between technology, society, economy, and legal frameworks. Understanding these interrelationships can be challenging and may require deeper analysis. Data availability is always a challenge for all researchers in Bosnia and Herzegovina, and in this case, data related to digital transformation are mostly unavailable and incomplete. The study has identified shortcomings in the existing legal framework that, among other factors analyzed, hinder further development of digital transformation. This primarily refers to the harmonization of regulations with new EU directives. Measuring the degree of digital transformation can be a very complex and time-consuming process, making it difficult to measure as a variable. As we have mentioned, digital transformation is a new concept and poorly researched in the Western Balkans. Accordingly, recommendations for further research suggest that researchers should explore the impact of digital transformation on specific industries such as agriculture, the financial sector, healthcare, education, etc. It is recommended to apply the Community Innovation Survey questionnaire, in which a relatively large number of companies of all sizes would participate, providing insights into the possibilities and limitations of implementing digitalization and its impact on, for example, the innovation of companies, as well as the comparability of data with identical surveys in Europe.

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Biography

Igor Mišić, MA, is a senior assistant in the subjects of Project Management, Quality Management, Crisis Management, and Quality Assurance in IT at the Faculty of Economics in Banja Luka. He graduated and completed his master's studies, and he is currently a PhD student in the Management and Entrepreneurship module at the Faculty of Economics in Banja Luka. He has published over ten scientific papers in management and finance journals. He has participated as a consultant in the development and implementation of several software solutions. He has extensive experience in the field of insurance.

Улога институција у дигиталној трансформацији компанија у транзиционим земљама

Игор Мишић

[1]Универзитет у Бањој Луци, Економски факултет, Мајке Југовић 4,
78 000 Бања Лука, Босна и Херцеговина

Кључне ријечи:
дигитална трансформација,
DESI индекс, западни Балкан

САЖЕТАК

Дигитална трансформација представља кључни фактор за конкурентност компанија како на локалном и регионалном, тако и на глобалном нивоу. Циљ овог рада је да процијени адекватност законодавног оквира у Босни и Херцеговини (БиХ) и да упореди ниво дигитализације у БиХ са другим земљама у региону. У мјерењу нивоа дигитализације, аутор користи DESI индекс, који процјењује четири кључне области: повезаност, људски капитал, интеграцију дигиталних технологија у пословном сектору и дигиталне јавне услуге. Аутор пружа преглед литературе о утицају институција на дигиталну трансформацију у транзиционим земљама, као и критички преглед актуелних и будућих трендова на ову тему. БиХ има застарио и неразвијен законодавни оквир у вези са имплементацијом дигитализације на системском и на нивоу компанија, који није усклађен са савременим трендовима. Као посљедица тога, БиХ се сврстава међу земље са најнижим степеном дигиталне трансформације у Европи у поређењу са другим земљама западног Балкана. Иако законодавни оквир није једини узрок ниског нивоа дигиталне трансформације у БиХ, он представља један од значајних фактора. Овај рад такође пружа препоруке доносиоцима одлука и менаџерима о могућностима и значају дигиталне трансформације за компаније, чиме даје одређене доприносе овој области.