AESSRA

The Role of Digital Transformation in Building a Competitive Economy: a Case Study of Azerbaijan

Kamran Abdullayev[1*], Rauf Allahyarov[2], Gunay Teymurova[3], Mahir Zeynalov[4] and Gulnara Fataliyeva[5]

[1]Department of Economy of Service Sphere, Institute of Economics of Ministry of Science and Education of the Republic of Azerbaijan, Baku, Republic of Azerbaijan
[2]Department of Finance and Accounting, Azerbaijan State University of Economics, Baku, Republic of Azerbaijan
[3]Department of General Economics, Western Caspian University, Baku, Republic of Azerbaijan
[4]Department of Industrial Economics, Azerbaijan State Oil and Industry University, Baku, Republic of Azerbaijan
[5]Department of Innovative Economy and Digital Transformation, Institute of Economics of Ministry of Science and Education of the Republic of Azerbaijan, Baku, Republic of Azerbaijan

*Corresponding author: 1kamranabdullayev@gmail.com (**ORCID ID:** 0009-0001-9864-8977)

ABSTRACT

The purpose of this study is to examine indicators of digital transformation in enterprises of Azerbaijan by analysing statistical data and forming recommendations for improving this process, considering regional features. In the course of the research, the following scientific methods were used: economic-statistical analysis, rating comparison analysis, deduction and induction, graphical methods. As a result of the study, the main advantages and disadvantages of the digital transformation process are identified. The place of Azerbaijan in the Digital Index rating is determined, the dynamics of the share of information-communication technologies in the gross domestic product (GDP) of the country is presented, and an analysis of the ease of establishing and conducting business in the country is conducted an economic-statistical analysis of data from Azerbaijani enterprises regarding the implementation of digital transformation on them was conducted. The following indicators were analysed: the main indicators of the use of information-communication technologies by enterprises, and the distribution of enterprises by the purposes of using the Internet. A number of recommendations were formulated regarding improving the process of digital transformation of enterprises in Azerbaijan.

HIGHLIGHTS

⊙ Digital transformation is a priority in the economic policy of most countries of the world, but along with many advantages, including increasing the competitiveness of the economy in general, it also carries serious challenges for economic entities.

Keywords: Innovations, business, enterprises, regional features, adaptation

In modern conditions, one of the main areas of forming a competitive economy at all its levels is digital transformation. This fact determines the need and relevance of constant monitoring of the main indicators related to the development of the digital economy at the macro, meso, and micro levels. Digital transformation can be defined as a process associated with fundamental changes in

the organisation, the course of which is ensured by the use of digital technologies, basic resources and opportunities to improve the activities of the organisation and increase its value to interested

parties (Gong and Ribiere, 2021). Its advantages include: reducing the cost of the organisation, increasing productivity, improving the process of developing and producing goods and services, and increasing their value, speeding up business processes, increasing the level of customer satisfaction (Savastano *et al.* 2019), the emergence of new sources of value creation (Reinartz *et al.* 2019), optimisation of communications and cooperation, expanding opportunities to overcome environmental problems (Llopis-Albert *et al.* 2021). The main problems of digital transformation for the economy include the need for significant investments, lack of knowledge and, as a result, the choice of inefficient approaches, cybersecurity risks, etc. (Sundaram *et al.* 2020; Chen *et al.* 2021).

In the studies by S. Nambisan *et al.* (2019) and C. Fernandez-Rovira *et al.* (2021), the advantages of digital transformation at the individual, corporate, and public levels are widely disclosed and the main conflicts that may arise between these levels are highlighted. H. Stewart (2022), recognising the necessity and main advantages of digital transformation, notes that its main problem remains to ensure the appropriate level of security. M.J. Sousa and A. Rocha (2019) dedicate their work to considering aspects of digital learning. Researchers note that digital learning, as a process using various technological devices that takes place in everyday work environments, can become the main driving force for employees to develop the necessary digital skills that contribute to the digital transformation of companies.

This study focuses on the roles of digital transformation in shaping the competitive economy of Azerbaijan, namely the business environment and enterprises of the region. The purpose of the study is to examine the current state of digital transformation in the Azerbaijani economy based on the analysis of statistical data and develop recommendations for optimising this process considering regional features.

MATERIALS AND METHODS

The methodological approach used in this study is based on an economic-statistical analysis of the main indicators of digital transformation in enterprises in Azerbaijan. Using this method,

the main indicators of the use of information-communication technologies (ICT) by enterprises are analysed. The costs of software and ICT equipment were also analysed. The economic-statistical analysis allowed assessing the dynamics and structure of individual indicators to determine the promotion of Azerbaijan in the context of the digital transformation process. In addition, using economic-statistical analysis, the dynamics of the share of information-communication technologies in the GDP of Azerbaijan was determined and the growth of the indicator in monetary terms was compared with changes in its percentage ratio.

Using the rating comparison analysis, the place of Azerbaijan in the Digital Index (DiGiX) rating among other world countries was determined. In addition, this method was used to determine the position of Azerbaijan on each of the indicators that reflect aspects of the ease of starting and running a business in the country. The use of deduction and induction methods allowed formulating recommendations on improving the process of digital transformation in Azerbaijani enterprises based on the results of the analysis. The results of the analysis performed in the study are visualised using graphical methods – diagrams, graphs, and tables.

The information base of the study is the scientific periodical literature of Azerbaijan and other countries of the world and data available in open access on the official websites of Eurostat (2022), International Trade Administration (2022), The State Statistical Committee of the Republic of Azerbaijan (2022). In addition, the results of calculating ratings are used DiGiX 2022 update: A multidimensional index of digitisation (2022) and Doing Business (2020).

RESULTS

Digital transformation as a factor of innovative economic development

A general idea of the positions of countries regarding achievements in the field of digital transformation can be obtained from special indices and ratings that are formed by various world organisations. Thus, the BBVA Research service provides the results of the DiGiX calculation for 2022 for 99 countries

of the world. This index evaluates the efficiency and progress of digital indicators of the countries under study and has the following structure: state-level acceptance, infrastructure, user acceptance, enterprise acceptance, accessibility, regulation (Fig. 1).
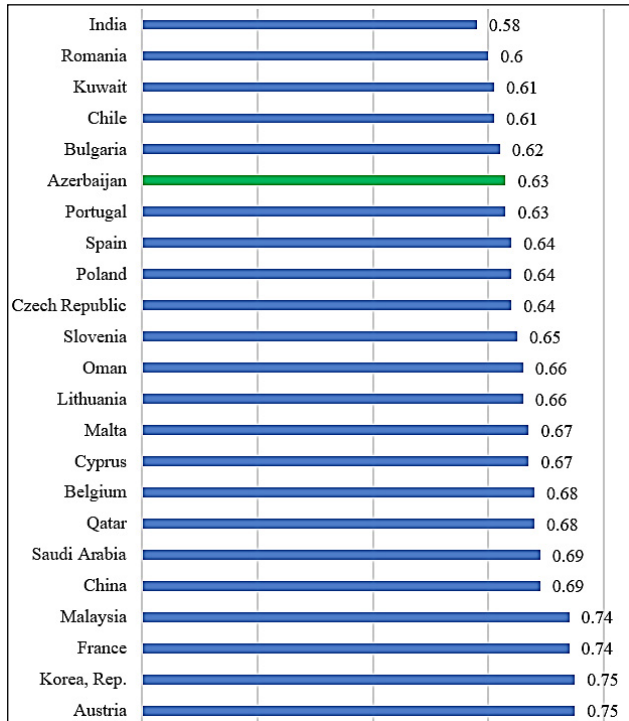
Fig. 1: DiGiX 2022 ranking (first 23 countries of 99)

ICT makes a substantial contribution to the GDP of the country, but its value is substantially lower than, for example, in the countries of the European Union (3.8% of GDP) (Eurostat, 2022). Therewith, although the amount of the ICT deposit in monetary terms is constantly growing, the interest rate fluctuates slightly and does not have a clearly defined growth trend.

General characteristics of of Azerbaijan business sector

The business field deserves special attention in the context of digital transformation in terms of building a competitive economy. In addition to their roles in economic development, small and medium-sized businesses substantially ensure the creation of new jobs and reduce the level of poverty, but in the ways of their development they face various barriers, in particular, related to lack of funding

(Gherghina *et al.* 2020). The main task of the project called Doing Business (2020) of the World Bank is to measure the basic norms of doing business and their compliance, for 190 countries of the world and some cities. The project calculates an indicator that evaluates the ease of doing business in the country on a scale from 1 to 100 (Fig. 2).
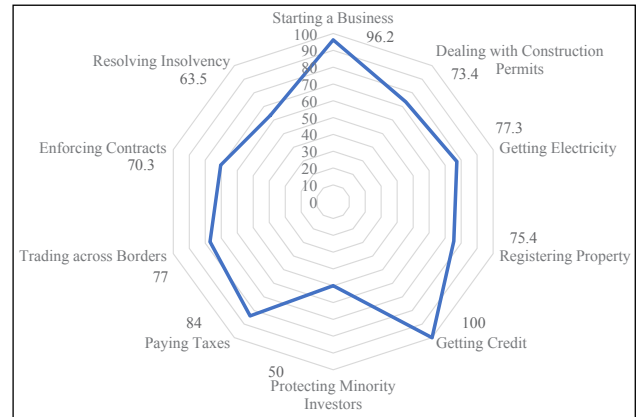
Fig. 2: Doing Business 2020 indicators (scores)

The rating of Azerbaijan indicators is presented in Table 1.

**Table 1:** Rank of Azerbaijan among the countries of the world by Doing Business indicators

2020	Rank
Starting a Business	9
Dealing with Construction Permits	59
Getting Electricity	80
Registering Property	44
Getting Credit	1
Protecting Minority Investors	105
Paying Taxes	40
Trading across Borders	83
Enforcing Contracts	28
Resolving Insolvency	47

As can be concluded from Fig. 3 and Table 1, Azerbaijan has the highest score on the indicator "getting credit", and a high score (96.2) on the indicator "starting a business". Thus, the conditions for starting a business in the country are favourable – they contribute not only to the easy foundation of business but also to obtaining appropriate funding, which is often the main problem for new businesses.

Introduction of innovations in enterprises

The analysis of the main indicators that characterise the ease of starting and running a business in Azerbaijan confirms that the country has created favourable conditions for starting a business. One of the factors that can increase the competitiveness of business, which will ensure, among other things, the economic development of the country in general, is the introduction of innovative technologies and digital transformation (Pieroni *et al.* 2019; Bouncken *et al.* 2021).
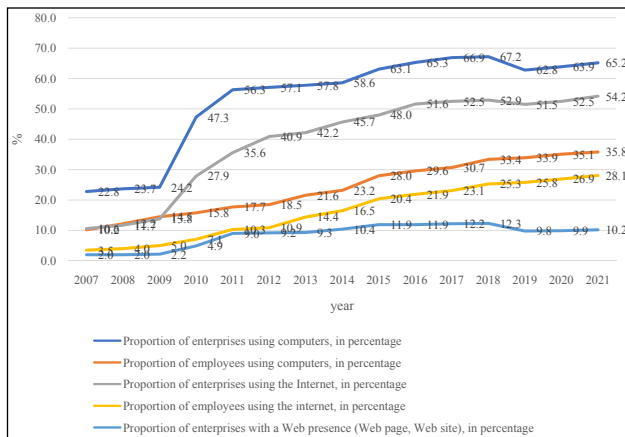
Source: The State Statistical Committee of the Republic of Azerbaijan (2022).

Fig. 3: Core indicators on use of ICT by enterprises, %

Fig. 4 shows the costs of Azerbaijani enterprises for ICT software and equipment for 2019-2021.
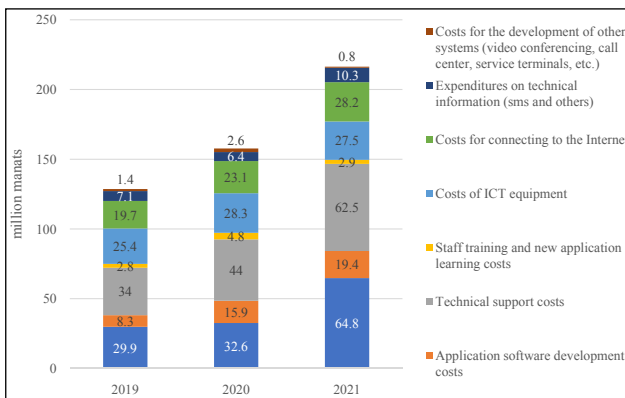
Source: The State Statistical Committee of the Republic of Azerbaijan (2022).

Fig. 4: Expenditure on software and ICT equipment, million manat

The analysis of innovation and digital transformation at enterprises in Azerbaijan shows that this process requires incentives and more active actions in relation to its development to form a competitive economy in the country. Based on the results obtained, the following recommendations regarding stimulating the process of digital transformation and introducing innovations in enterprises in Azerbaijan can be proposed:

- expanding internet access opportunities for enterprises, increasing the area of internet coverage and improving the computer literacy of employees and the population;
- implementation of state programmes related to stimulating the development of innovations and digital transformation in enterprises and creating favourable conditions for mutually beneficial cooperation between enterprises of different industries and organisations engaged in information-communication technologies;
- development of electronic commerce, stimulating ICT investment and international cooperation to gain experience in implementing and using innovative technologies.

Specific types of innovations that should be considered during the process of digital transformation in enterprises are the following technologies: artificial intelligence, Big Data, machine learning, blockchain, cloud technologies, data analytics, etc. (Akter *et al.* 2020).

DISCUSSION

S. Albukhitan (2020) is divides the advantages that digital transformation brings to companies into five groups: improving productivity in terms of accelerating and improving product development and design (for example, using augmented reality and 3D printing technologies, etc.); improving the quality of products (using innovative machine learning tools to identify and predict the causes of defects); reducing costs by collecting data and analysing all stages of the production process; improving product customisation; ensuring the safety of employees in their workplaces. The researcher focuses on the fact that not only the acceptance and assimilation of innovations but also their generation and stimulation by the organisation itself are important for maintaining and increasing the competitiveness of an organisation.

In the paper by F. Brunetti *et al.* (2020), it is noted that challenges that are associated with

the process of digital transformation require an appropriate response at different levels of the system, the specifics of which are determined by regional features. This means that the process of digital transformation requires a unique approach that must be developed within each individual regional system. This approach should consider the technological, cognitive, and other resources of the region, including special skills, to increase the competitiveness of both the entire region and its individual structural units. L. Amanova *et al.* (2021) investigate the digital transformation of businesses in the tourism sector, and one of the recommendations points to encouraging the use of social networks and mobile applications to improve customer interaction. This recommendation is relevant for enterprises in almost any field of activity and today is quite effective.

The advantages of using agile methodology are considered in the paper of M.F. Abrar *et al.* (2019), among them: strong support in project implementation, cooperation within the organisation, face-to-face meetings of employees to solve problems and reports, improving management efficiency, increasing customer satisfaction, planning, and risk management, ensuring effective communication and cooperation between employees within the company, etc. Such methodologies were not discussed in the study, but in the context of increasing the competitiveness of Azerbaijani Enterprises, their implementation can be highlighted as a separate recommendation that complements the conclusions of the study.

The analysis of the researchers works allows identifying the recommendations of researchers not mentioned in the study that can substantially affect the increase in the competitiveness of enterprises: constant monitoring of trends in digital transformation at the level of the state and individual enterprises; stimulating the use of social networks and mobile applications to improve customer interaction; using agile methodology to improve the management system and human resource management.

CONCLUSION

In the study, theoretical aspects of digital transformation were presented and analysed, including its definition and main advantages and disadvantages. The main advantages of digital transformation include minimising the costs, increasing productivity, improving the process of development and production of goods and services, increasing their value for interested parties, accelerating business processes, increasing customer satisfaction, using new sources of value creation, optimising communications, and positive effects for the environment. The problems faced by enterprises in the course of digital transformation are: high costs for implementing innovations, insufficient level of knowledge, which can lead to the choice of inappropriate approaches, increased feasibility of implementing cybersecurity risks, lack of control and regulation.

Analysis of the trend of the share of information-communication technologies in the GDP of the country allows concluding that despite the fact that the size of the share is growing in monetary terms, this share does not have a clearly defined growth trend in percentage terms. In the study, it is established that small and medium-sized businesses are the most flexible, easily accept innovations, and are their generators. The study analysed the degree of ease of starting and doing business in Azerbaijan as one of the main areas of improving the competitiveness of the economy of the country. It is determined that the country has created favourable conditions for opening a business and accessing credit, but in the course of doing business, there may be problems related to getting electricity, protecting minority investors, and trading across borders.

As a result of the economic-statistical analysis of the implementation of digital transformation in enterprises of Azerbaijan, the values and dynamics of such indicators were determined: main indicators of ICT use by enterprises, costs for software and ICT equipment, structural distribution of enterprises by the purposes of using the Internet. It was established that innovative opportunities in the country are not used enough by enterprises. However, there is a tendency for enterprises in the country to increase their spending on ICT software and equipment. As a result of the study, recommendations were made regarding improving the process of digital transformation in enterprises in Azerbaijan.

REFERENCES

Abrar, M.F., Khan, M.S., Ali, S., Ali, U., Majeed, M.F., Ali, A., Amin, B. and Rasheed, N. 2019. Motivators for large-scale agile adoption from management perspective: A systematic literature review. *IEEE Acc.,* **7**: 22660-22674.

Akter, S., Michael, K., Uddin, M.R., McCarthy, G. and Rahman, M. 2020. Transforming business using digital innovations: the application of AI, blockchain, cloud and data analytics. *Ann. of Oper. Res.,* **308**: 7-39.

Albukhitan, S. 2020. Developing digital transformation strategy for manufacturing. *Proc. Comp. Sci.,* **170**: 664-671.

Amanova, L., Abesadze, N. and Abesadze, O. 2021. The importance of digital technologies in the revival of tourism in Georgia and Azerbaijan. *Econ. and Soc. Dev.: Book of Proc.,* **2021**: 674-678.

Bouncken, R.B., Kraus, S. and Roig-Tierno, N. 2021. Knowledge- and innovation-based business models for future growth: Digitalized business models and portfolio considerations. *Rev. of Manag. Sci.,* **15**: 1-14.

Brunetti, F., Matt, D.T., Bonfanti, A., De Longhi, A., Pedrini, G. and Orzes, G. 2020. Digital transformation challenges: Strategies emerging from a multi-stakeholder approach. *The TQM J.,* **32**(4): 697-724.

Chen, C.L., Lin, Y.C., Chen, W.H., Chao, C.F. and Pandia, H. 2021. Role of government to enhance digital transformation in small service business. *Sust.,* **13**(3): 1028.

DiGiX, 2022 update: A multidimensional index of digitization. 2022. https://www.bbvaresearch.com/ (Last Accessed on 9th March, 2023).

Doing Business. Azerbaijan. 2020. www.doingbusiness.org (Last Accessed on 9th March, 2023).

Eurostat. 2022. https://ec.europa.eu/ (Last Accessed on 9th March, 2023).

Fernandez-Rovira, C., Valdes, J.A., Mollevi, G. and Nicolas-Sans, R. 2021. The digital transformation of business. Towards the datafication of the relationship with customers. *Tech. For. and Soc. Chang.,* **162**: 120339.

Gherghina, S.C., Botezatu, M.A., Hosszu, A. and Simionescu, L.N. 2020. Small and medium-sized enterprises (SMEs): The engine of economic growth through investments and innovation. *Sust.,* **12**(1): 347.

Gong, C. and Ribiere, V. 2021. Developing a unified definition of digital transformation. *Techn.,* **102**: 102217.

International Trade Administration. 2022. https://www.trade.gov/ (Last Accessed on 9th March, 2023).

Llopis-Albert, C., Rubio, F. and Valero, F. 2021. Impact of digital transformation on the automotive industry. *Tech. For. and Soc. Chang.,* **162**: 120343.

Nambisan, S., Wright, M. and Feldman, M. 2019. The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. *Res. Pol.,* **48**(8): 103773.

Pieroni, M.P., McAloone, T.C. and Pigosso, D.C. 2019. Business model innovation for circular economy and sustainability: A review of approaches. *J. of Clean. Prod.,* **215**: 198-216.

Reinartz, W., Wiegand, N. and Imschloss, M. 2019. The impact of digital transformation on the retailing value chain. *Inter. J. of Res. in Mark.,* **36**(3): 350-366.

Savastano, M., Amendola, C., Bellini, F. and D'Ascenzo, F. 2019. Contextual impacts on industrial processes brought by the digital transformation of manufacturing: A systematic review. *Sust.,* **11**(3): 891.

Sousa, M.J. and Rocha, A. 2019. Digital learning: Developing skills for digital transformation of organizations. *Fut. Gen. Comp. Syst.,* **91**: 327-334.

Stewart, H. 2022. Digital transformation security challenges. *J. of Comp. Inf. Syst.,* **2022**. https://doi.org/10.1080/08874417.2022.2115953

Sundaram, R., Sharma, D. and Shakya, D. 2020. Digital transformation of business models: A systematic review of impact on revenue and supply chain. *Inter. J. of Manag.,* **11**(5): 9-21.

The State Statistical Committee of the Republic of Azerbaijan. 2022. https://www.stat.gov.az/ (Last Accessed on 9th March, 2023).