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## THE ROLE OF DIGITALIZATION IN ECONOMIC DEVELOPMENT

### EL PAPEL DE LA DIGITALIZACIÓN EN EL DESARROLLO ECONÓMICO

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#### ABSTRACT

Digitalization of the economy is a process of structural transformation in which digital technology and information are used to enhance many aspects of economic activities, from public administration to health, education, and operations within businesses. The reason for doing so lies with the rapid development of ICT, which has totally changed the way consumers interact, firms are organized, and production is carried out. While the use of digital technologies such as the Internet, artificial intelligence, and blockchain has already been widely recognized as crucial in optimizing economies, only a small amount of research focuses on the impact of digitalization in developing economies, including Azerbaijan. Thus, in this paper, an attempt is made to analyze the influence of digitalization on economic development by focusing attention on the example of the Republic of Azerbaijan and further investigate how the implementation of information and communication technologies in this country has been a key tool for its economic development. The research reveals that digitalization serves as more than just the application of digital technologies to economic processes; it functions as a powerful catalyst for increasing productivity, optimizing resource allocation, and creating new development opportunities. These findings underline that digitally enabled transformation is of strategic relevance to achieve economic growth and underline, therefore, that ICT infrastructure development promotion and digital integration in most economic sectors become one of the top priorities of policy makers to advance economic competitiveness and sustainability.

**Keywords:** Digital economy, Digital technologies, Internet, Economic development, Electronic trade.

#### RESUMEN

La digitalización de la economía es un proceso de transformación estructural donde se utilizan la tecnología digital y la información para mejorar muchos aspectos de las actividades económicas, desde la administración pública hasta la salud, la educación y las operaciones dentro de las empresas. La razón para ello radica en el rápido desarrollo de las TIC, que ha cambiado totalmente la forma en que los consumidores interactúan, se organizan las empresas y se lleva a cabo la producción. Si bien el uso de tecnologías digitales como Internet, la inteligencia artificial y la cadena de bloques ya ha sido ampliamente reconocido como crucial para optimizar las economías, solo una pequeña cantidad de investigaciones se centran en el impacto de la digitalización en las economías en desarrollo, incluido Azerbaiyán. Por lo tanto, en este documento, se intenta analizar la influencia de la digitalización en el desarrollo económico centrandose la atención en el ejemplo de la República de Azerbaiyán e investigando más a fondo cómo la implementación

de las tecnologías de la información y la comunicación en este país ha sido una herramienta clave para su desarrollo económico. La investigación revela que la digitalización sirve para algo más que la aplicación de tecnologías digitales a los procesos económicos; funciona como un poderoso catalizador para aumentar la productividad, optimizar la asignación de recursos y crear nuevas oportunidades de desarrollo. Estos hallazgos subrayan que la transformación habilitada digitalmente es de relevancia estratégica para lograr el crecimiento económico y subrayan, por lo tanto, que la promoción del desarrollo de la infraestructura de las TIC y la integración digital en la mayoría de los sectores económicos se convierten en una de las principales prioridades de los responsables políticos para avanzar en la competitividad económica y la sostenibilidad.

**Palabras clave:** Economía digital, Tecnologías digitales, Internet, Desarrollo económico, Comercio electrónico.

## INTRODUCTION

Digital economy is a form of organization of economic activity of people based on electronic and digital technologies, realized through cloud technologies, e-commerce, digital platforms and internet business. This includes online stores, services provided online, information sites, online communities and other forms that allow for income through the processing and presentation of information, as well as the digitization of manufactured goods and services. The digital economy is a special stage of economic development, the main features of which are the mass use of digital information, the wide application of multilateral business models and, in general, the opening of new opportunities for the existence of the economy and society (Pan et al., 2022; Shi et al., 2023).

In general, the digital economy is an activity related to the development of digital technology in the provision of e-commerce, internet commerce, online services, electronic payments, crowdfunding and other types of industries (Peters, 2023) Digitalization of the economy can be defined as a modern innovative development stage of economic development based on the integration of digital and material resources in the field of production and consumption, economy and society. It is characterized by new methods of creating, processing, storing, and transmitting information in all areas of human activity. The expansion of the digital economy in the world, the rapid development of ICT in all spheres of society encourages the reduction of informal employment in the labor market (Narmanov, 2022; Xia et al., 2024).

The digital economy covers all aspects of production and economic activity: production, management, marketing, finance, external communication channels and is aimed at increasing the efficiency and competitiveness of business and the economy as a whole. It is an economic activity in which the main factor of production is the use of large amounts of data processing and analysis results in digital form, which can significantly increase the efficiency of various equipment, technologies, and types of production compared to traditional forms of management (Udaltsova, 2020). The digital economy is shaped by all companies that manage their activities in digital format and provide information on the Internet. It is becoming an integral part of global economic processes, an engine of growth and development of enterprises (Huang et al., 2024). In the era of rapid development of the digital economy, its importance is manifested in deep integration with economic and social industries, promotion of new models and new industrial processes, digital transformation and constant application of new technologies. This leads to the transformation and modernization of enterprises, industry and society, contributing to sustainable development based on innovation models (Limin & Xiao, 2024; Xu & Li, 2022).

Concepts such as e-commerce, digital marketing, digital labor, and Bitcoin stand out in the concept of digital economy. Among these concepts, e-commerce is the most prominent and relevant. The concept of electronic commerce, which is also used instead of the term digital economy, is a platform where the purchase and sale of products or services and the flow of cash are carried out over the Internet. The advantages of e-commerce include being open and accessible at any time of the day, speed and ease of access, a wide range of products and, most importantly, international accessibility (Karachor et al., 2020, p. 2146).

**In general, the following directions of the development of the digital economy can be defined:**

1. Optimizing the industrial structure of the digital economy according to the level of development of the regions. Each region has its own advantages in terms of geographical location, natural conditions, resources and other characteristics, and as a result, there is a big difference between the level of development of the digital economy and regional development.
2. Enhancing the adoption of digital innovations that help create a solid foundation for the digital economy.
3. Deepening the application of digital technologies. The application of digital technologies is the main goal of the development of the digital economy.

The digital economy is changing the structure of competition between countries by becoming the main driving force of economic development (Ranta et al., 2021). In this regard, comprehensive implementation of the principles of effective application of digitalization can prevent or significantly reduce the impact of negative consequences. Digitalization leads to changes in the quality of life as well as in the economy. Widespread implementation of digitization can lead to risks and uncertain outcomes. Digitalization is changing the way people communicate and interact with their environment. Smartphones, computers, self-driving cars, new technologies and devices have changed the way we access and distribute information (Jawad et al., 2021). The development of ICT and the innovations that appear in parallel with them also increase the growth indicators of economies. ICT development affects global trade patterns. Increasing digitization of economic processes leads to restructuring of economic activity.

Taking into account the above, the objective of this paper is to analyze the impact of digitalization on the development of the economy, focusing specifically on the case of the Republic of Azerbaijan. To this end, the work used elements of generalization methods, comparative analysis, development dynamics, among others, to reveal the effects of digitalization. Based on these methods, it was determined that companies can also use digital technologies to manage, monitor and analyze their activities, as well as to market their services and products.

## DEVELOPMENT

Digitization as the main trend of the digital economy

Digitization is one of the main trends in the effective development of the digital economy. It forms the basis of the digital economy and defines the reconfiguration of traditional formats into digital ones to increase the efficiency of business processes and improve quality of life by increasing the speed of exchange, accessibility, and business efficiency.

Digitization includes the following processes:

1. The use of ICT to ensure interaction between objects;
2. The ability to use the Internet, sensor networks, mobile networks, and work online;
3. The use of innovative digital communication channels, data recording, processing, and storage methods;
4. The creation of new markets and consumers, and new business models.

In general, we can consider digitalization as a system of socio-economic relations based on the use of large amounts of data that are created and processed in various information systems.

The application of digitalization contributes to the rapid development of technology, equipment, robotization, and automation. It expands the scope of the Internet and its possibilities, allows companies to optimize employee work, provides training using remote technologies, helps increase labor productivity, reduces traffic load and the negative consequences of environmental pollution, expands the advertising audience to promote products and ideas, increases the availability of goods and services, and stimulates the creation of new goods, services, and professions.

The lack of development in software and Internet technologies in a country leads to dependence on foreign countries and their companies. This affects not only the activities of individual organizations but also all economic sectors of the country as a whole. The changes brought about by digitization are so significant that they have changed not only people's work and economic practices but also their lifestyles, value systems, and ways of achieving their goals. This is especially evident among representatives of the younger generation.

The process of digitalization has a positive effect on the development of relations in society and increases the convenience of doing business for all interested parties: individuals, medium and large companies, small business entities, and government institutions. Many goods and services can be found on the Internet, paid for online, and received at convenient locations. This saves time and effort.

Digitization has other advantages, among which we can mention:

- The provision of the most appropriate options for goods and services;
- The facilitation of access for individuals and legal entities to various types of services;
- The continued active creation of new startups, resulting in new jobs and increased labor productivity;
- The observation of decreased costs in companies that switch to electronic work;
- Activities becoming more transparent in the digital economy, as transactions are conducted online and tax authorities have access to information about purchases and sales;

- The increase in country production competitiveness and expansion of entrepreneurship geography.

As digitalization creates new opportunities, it also creates risks. The main problems of business digitalization are information leakage and legislative restrictions in some industries. The creation of new opportunities for fraud and the increase in unemployment levels are among the negative aspects of digitalization.

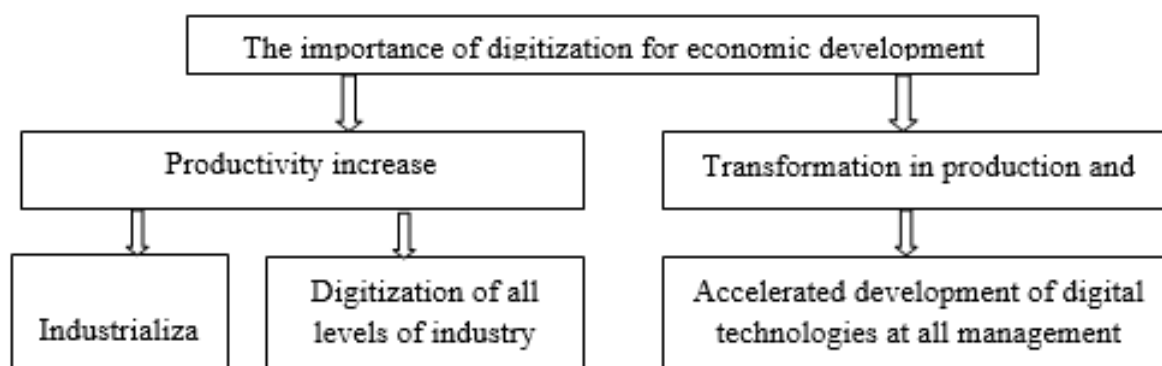
### Main economic benefits of digitization

Digitalization affects the economy. A large number of industries are undergoing changes under its influence. To determine the level of this impact, industries use the digitization index of economic and social sectors. This index helps compare the development and level of digitization across key sectors of the economy.

The importance of digitization for economic development is defined by its role in increasing productivity and developing industrial relations (Figure 1). The active development of digitization helps increase productivity and transform relationships within industries. In terms of increasing production efficiency, digitization manifests in two aspects: industrialization and digitalization of industry. The digitalization of industry refers to the information industry, which serves as the basis for the development of the digital economy.

Fig 1. The importance of digitization for the development of the economy.

Source: own elaboration.



The digitalization of industry involves the development of key industries through digital technologies to significantly increase production efficiency. It encompasses the development of ICT industries, including electronic information production, telecommunications, software and information technology services, and the Internet industry. The digitalization of industry deeply integrates advanced digital technologies with traditional industries, accelerating their transformation and improvement while increasing production efficiency. However, for digitization to benefit all citizens and businesses, there must be a healthy competitive environment that promotes innovation, facilitates its spread, and helps people benefit from innovative technology (Ibrahimov, 2023, p. 102).

A specific stage in the modern development of STP is the digitization of the economy, which relates to the widespread application of computers, ICT, Internet networks, electronic commerce, and cloud services in public, social, production, and other fields. The extensive development of digitization processes began at the end of the 20th century and continues with the evolution of the Internet. This process is most evident in securities markets, where asset digitization was fully completed by the middle of the first decade of the 21st century. This development greatly facilitated trading and enabled the use of special application software packages - trading machines or robots - though it did not lead to a significant increase in securities transaction profitability.

The effect of economic digitization on economic growth is contradictory, as it can be either positive or negative. For example, while introducing product innovations promotes growth, the digitalization of assets and their accounting in production and consumption leads to a decrease in their cost value. This decrease can result in a relative reduction in GDP volume, potentially leading to a slowdown or even a decline in established growth rates. The development of digitization processes across various areas and sectors of the national economy can significantly affect economic growth rates of individual countries and the world as a whole.

Currently, economic digitalization takes various forms, based on the use of ICT and Internet capabilities and their implementation across social, household, and industrial activities. This process involves the development of computers, computer technologies, and software products, as well as the formation of special platforms based on computer networks that enable information processing and redistribution among interested parties. This leads to the integration of computer technologies and the Internet in real business, e-commerce, logistics, and other areas. In general, the digitalization of the economy, considered the modern stage of STP development, consists of introducing specific types of innovation into real economic practice.

### Current state of digitization in Azerbaijan and some state measures in this field.

Currently, companies and firms that provide and support economic digitalization, and operate in the fields of computerization, ICT, and network business, are beginning to take leading positions in terms of sales volume, profit, and per capita income. One of the most important trends in the world economy in recent years is economic digitization. To keep pace with this trend, Azerbaijan established a Digital Trade Hub based on President Ilham Aliyev's Decree of February 22th, 2017, "On additional measures to strengthen the position of the Republic of Azerbaijan as a Digital Trade Hub and expand foreign trade operations" (Aliyev, 2021). This decree plays a crucial role in accelerating digitization in Azerbaijan.

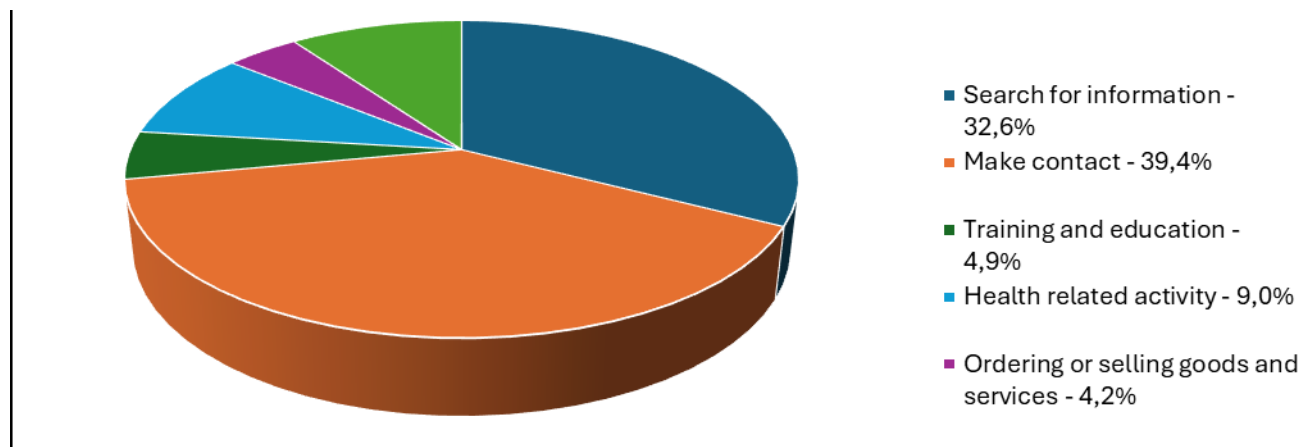
Azerbaijan has very favorable opportunities for digitalization development. The country's participation in global digitalization, international cooperative relations, and geographical location are among the factors accelerating this process. Digitalization is considered one of the main driving factors of economic development under integration conditions. Based on digitization's role in the country's development, this area is considered a priority direction in all future strategies.

In the Presidential Decree of the Republic of Azerbaijan "On improving management in the field of digital transformation" dated April 27th, 2021, it is emphasized that digital transformation of society and economy is one of the main priorities facing Azerbaijan in recent years (Aliyev, 2021). Digitalization can be defined as the application of ICT to all spheres of activity at various levels, including economic systems. Digitalization is based on digital technologies' application, which requires substantial investment. It requires not only increased investments in digital technologies but also radical modernization of infrastructure across almost all economic sectors (Oleshko et al., 2022, p. 22).

The application of digital technologies can contribute to high-quality economic development. Digital technologies are crucial in ensuring development sustainability. It is no coincidence that achieving goals such as sustainable development, quality education, and health depends largely on ICT and digital technologies (Gasimli et al., 2023, pp. 68–69).

To analyze the level of digital technology use, especially ICT, in Azerbaijan, let us examine the following illustration (Figure 2).

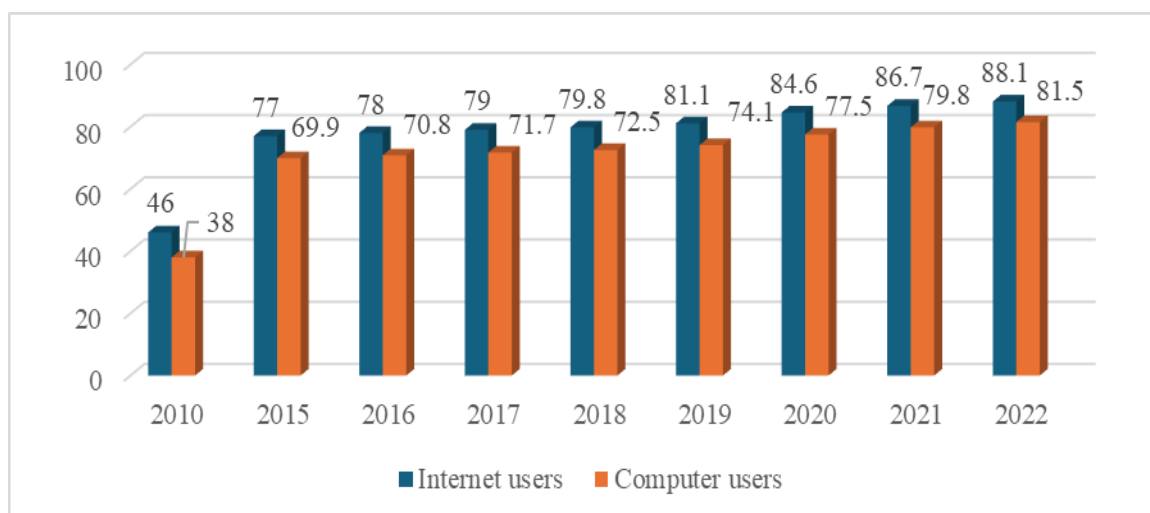
Fig 2. Goals of Internet use in Azerbaijan in 2022.



Source: own elaboration.

According to Figure 2, in Azerbaijan, the Internet was used primarily for establishing contact (39.4%) and searching for information (32.6%). The lowest Internet usage was for ordering and selling goods and services (4.2%). The effects of digitization across various sectors have become more pronounced, especially with the increased use of Internet-based technologies during the COVID-19 pandemic. The number of Internet and computer users in Azerbaijan has also increased since the pandemic's onset, as shown in Figure 3.

Fig 3. Number of internet and computer users per 100 people in Azerbaijan.

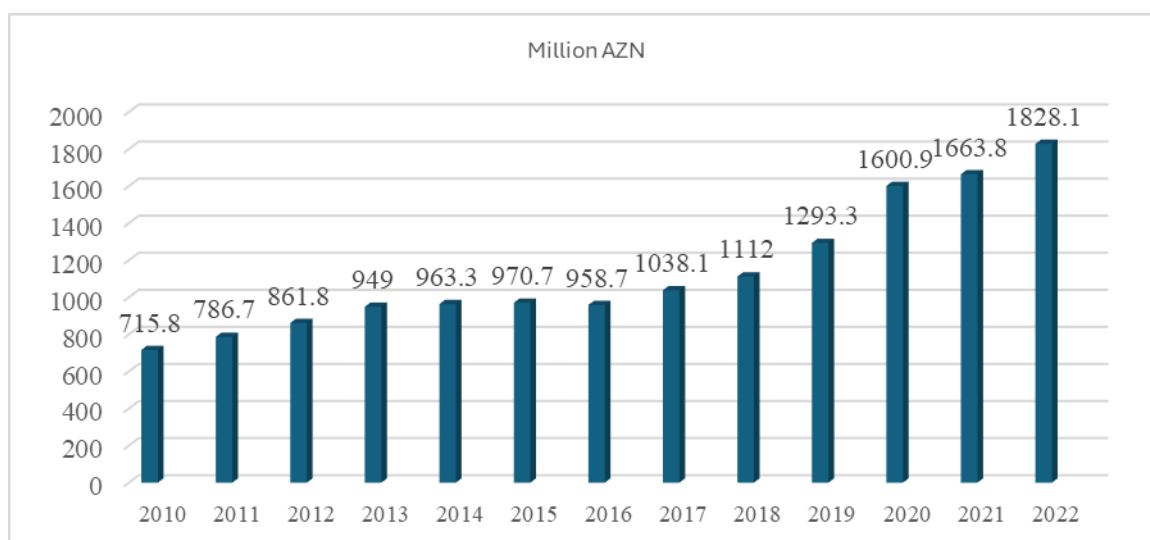


Source: own elaboration.

Figure 3 shows a continuous increase in the number of not only Internet users, but also computer users. But the number of people using the Internet is more than the number of people using computers.

The increase in the number of Internet users in Azerbaijan has also affected the increase in the volume of added value created in the ICT sector, which can be clearly seen in the following picture (Figure 4).

Fig 4. Added value created in the ICT sector of Azerbaijan.



Source: own elaboration.

As shown in Figure 4, the amount of added value created in Azerbaijan's ICT sector has been continuously increasing. This indicator reached its highest volume in 2022, showing increases of 2.6 times compared to 2010, 88.3% compared to 2015, 14.2% compared to 2020, and 9% compared to 2021. However, this indicator's specific weight in the country's GDP remained very small (1.4%).

The Internet and digital services are becoming increasingly widespread worldwide. As the Internet has reduced search costs, buyer searches have increased. This decrease in search costs and increase in buyer searches has intensified price competition among sellers, resulting in lower market prices. While many operations were previously performed physically, most are now performed digitally (Ta el, 2020, p. 128).

A correct assessment of digital economy development levels will help in studying digitalization's advantages and disadvantages in detail, enabling practical and targeted proposals for sustainable and rapid development of the digital economy in the future. Digitalization of the economy is a key factor affecting the formation of an attractive investment environment in the country. Investors seek opportunities to enter markets in countries with developed digital infrastructure and e-commerce. The development of e-commerce requires strong digital infrastructure, including expanded and improved secure digital payment solutions and reliable logistics networks. E-commerce encourages entrepreneurship and innovation, creating a comprehensive database for decision-making and analysis. For investors monitoring e-commerce expansion, these factors present opportunities for revenue growth and innovation.

Fundamental reforms in Azerbaijan have led to digital transformation and stable e-commerce growth rates. Azerbaijan's position in international rankings, including the UN Global Study on Trade Facilitation, shows growth of 6.67% in the transparency indicator in 2021 compared to 2019, and 16.67% in cross-border undocumented trade. In the World Bank's GovTech Maturity Index (GTMI) report for 2022, Azerbaijan was included in the top 35% of countries due to its high digitalization level. Additionally, the single digital platform model applied in the e-commerce sector can be used to further improve Azerbaijan's investment environment (Bayramov, 2023; World Bank, 2022, p. 35).

The global political and economic situation emphasizes the importance of national competitiveness, which is determined by the competitiveness of enterprises operating within each country's territory. Business competitiveness directly depends on flexibility and speed of response to

ongoing changes, including digital economy challenges. The digitization process results in digital transformation of objects, especially businesses. A business's digital transformation is determined by its use of digital technologies in production and economic activities, software availability, personnel's digital literacy level, and other factors. Modern business conditions require constant searching for digital-based innovative solutions and new business models. In the 21st century, using a personal computer, email, and maintaining a company website are no longer competitive advantages but requirements for market survival. However, implementing information systems, online catalogs, digital advertising presentations, mobile applications for customer data collection, and developing and marketing new digital products can become drivers for increasing business process efficiency.

Digital transformation of business is characterized not only by the use of digital technologies in business processes but also by more flexible thinking among company top managers. Today, business digital transformation is an inevitable process of adaptation to new digital economy conditions. Businesses use digital technologies to manage, monitor, and analyze their activities, as well as to market their services and products. Most financial products are accessible online, including loans, bill payments, and deliveries, which are benefits of digitization. All economic activities conducted on the Internet exemplify economic digitalization. Any business conducting operations online can be considered digital.

In the long term, digitalization can serve as a crucial structural element of economic growth. The greatest effects from digitization can be achieved in high-tech industries and knowledge-intensive service sectors, where efficiency can increase more rapidly than in other areas of economic activity. Thus, digitization has expanded over recent years and now affects every economic sector. Under its influence, new technologies are being applied that positively affect the country's economic development. Correct implementation and application of digitization products are essential for achieving maximum success.

## CONCLUSIONS

Digitalization of the economy has a great impact on modern society and business. It is changing the way businesses operate and providing new opportunities for growth. Digitization allows companies to automate processes, optimize operations, and increase productivity, which helps reduce costs and increase efficiency. Digital technologies stimulate innovation and enable enterprises to develop new business models, enter new markets, and create unique products and services. They also improve

customer interaction and provide more convenient and personalized services. In today's world, digitization plays a key role in improving people's living standards, but its positive impact depends mainly on digital literacy, trust in digital services, and the information culture of the population of each country. It serves as a real source of competitive advantage for enterprises and the country's economy as a whole.

Digitization is affecting all major markets currently operating and helping to create new markets, most of which will be virtual in nature. Digitalization of the economy is ensured through the computerization of all processes, including data processing technologies. Modern ICT tools contribute to the digitization and assimilation of all information flows to build an information society. Thus, taking into account the importance of digitization for the country's economy and population, attention should be paid to the following points:

1. The introduction of digital platforms for economic management is a politically important task. Its solution can not only recreate material production and create a foundation for future innovations but also ensure the country's rapid economic development.
2. The effectiveness of digitization should be increased, and to achieve this, modern technologies should be accessible to everyone in the country. Currently, access to the Internet is limited due to the technical and financial constraints of the population in most regions of Azerbaijan.
3. Digitization of the economy should become a promising direction of development. All enterprises should actively use its tools in their activities. Digitization can significantly speed up production and information processes, which can open up wide prospects for qualitative changes in business and its long-term development.
4. The implementation of digitalization is of great importance for the country's economy and its population but it may also create the following problems:
5. As digital technologies develop, threats and risks for organizations and the population increase. This is primarily related to the security and privacy of personal data. The solution to this problem should remain a central focus of the state.
6. An important problem related to the rapid development of digital technologies is the emergence of new opportunities for fraud. The legal protection of the population and organizations against fraudulent actions should be strengthened.
7. There are mismatches between the quality of specialist training and labor market requirements. This problem

is particularly acute in the regions of Azerbaijan. The gap between wages and opportunities for professional advancement leads to a shortage of qualified personnel in the regions. Therefore, this problem needs to be addressed.

8. Obstacles to digital development should be removed, which will yield significant economic benefits through reduced production time, leading to increased labor productivity and the creation of products and services with new qualities. Integration into a new system of relations for digitalization process participants will lead to increased flexibility and speed in management decision-making.
9. Digital technologies should serve as catalysts for advanced technological processes. Therefore, investments in digital potential development should be increased, as this is one of the most important factors in the competitiveness of economic entities under modern conditions.

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