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IMPACT OF DIGITALIZATION ON THE WORLD ECONOMY DEVELOPMENT

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Abstract

The choice of this research topic is reasoned of the relevance of the digital economy in the modern world. It impacts the economies of various countries, both at the micro and macro levels, as well as their economic growth trends. The relevance of a systematic study of digitalization is a priority both at the global and regional levels. The aim of the study is a statistical assessment of the impact of digitalization on world economic development, as well as a digitalization assessment on all levels of the world countries. To achieve this goal, the following research tasks were identified: to assess the current level of development of the digital economy, study the impact of digitalization on GDP, and identify trends and prospects for digitalization as a global process. The methodology of the research conducted by the authors is based on general scientific methods of cognition: analysis and synthesis, historical and comparative methods. The study of the state and development of the digital economy conducted by the authors made it possible to identify and determine the motivational direction of introducing digital technologies by organizations and companies, due to obtaining competitive advantages. All conditions and opportunities have been created in full to implement the development of the digital economy in many countries.

Keywords: *Digital economics. Economics of innovation. Innovations. Digitalization.*

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1 INTRODUCTION

In recent years, we have seen a rapid change in world processes, including economic ones. The

reason for this is digitalization, which includes high-tech digital technologies development and implementation in all spheres of human life and contributes to the entry of states and society into an era of global change.

Digitalization covers several areas: big data, artificial intelligence, wireless communications, virtual and augmented reality, blockchain, cloud computing, smart homes, the Internet of Things, robotics, and 3D printing. According to a study by MGI (McKinsey Global Institute) conducted in 2017, every second an inhabitant of the Earth had a connection to the Internet (Osipovskaya, 2019)

The level of digitalization in many countries, for example, in the E. U. countries, exceeds 50% (Fig. 1).

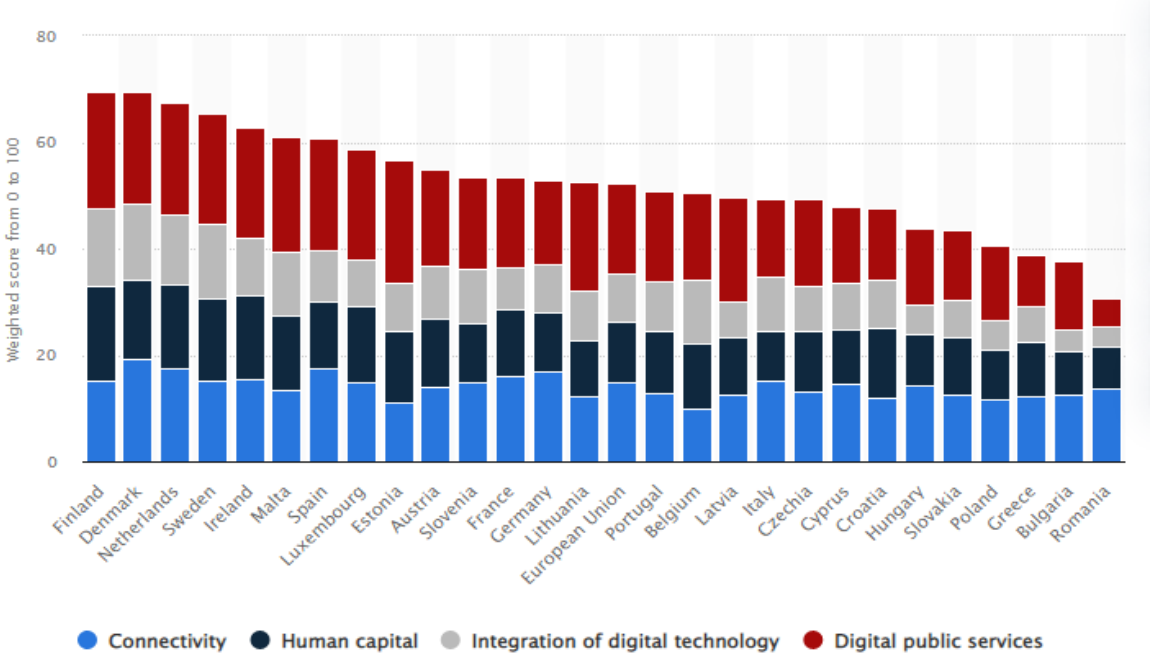

Fig. 1. Digitalization level of the European Union in 2022, by country (index score)

Source: (Petrosyan, 2023)

The world economy, like other areas, cannot remain detached from scientific and technological progress. Therefore, digitalization also affects it. Digitalization leads to qualitative structural economic changes, so the "digital economy" emerges.

2 DEFINITION OF THE DIGITAL ECONOMY

The term "digital economy" refers to 1995. During this time, it was associated with the intensive growth of information and communication technologies. However, despite the long period of use of the term, neither Western nor Russian scientists currently have a well-established meaning of the term "digital economy". In this connection, there are many definitions of the digital economy.

Among the authors studying digitalization, the most notable are K. Schwab, A. Shane, C. Perez, D.G. Rodionov, A.E. Skhvediani, A.A. Bondarev, E.V. Ustyuzhanina, and A.V. Sigarev.

The World Bank made one of the definitions of the digital economy. It defines the digital economy as a system of economic, social, and cultural relations based on using digital information and communication technologies (Mitin, 2017).

In the publications obtained because of statistical calculations, there is a significant number of others but in the Russian Federation, narrower values are excluded than in the publications, and sources are identified (Golovenchik, 2019).

Particularly, in Russia the official definition of the digital economy is different. "The digital economy is an economic activity in which digital data is felt, the large volume processing and the use of analysis results, which, in comparison with the identification and forms of management, can increase the efficiency of various types of production, technologies, equipment, storage,

sale, delivery of goods, and services" (Kozyrev, 2017). In the definition's interpretation, special attention is paid to information (data) in digital format, which allows you to understand the essence of this term correctly.

In all cases, the authors we agreed with, recognize the leading role of information and communication technologies, primarily the Internet, in the modern economy and that they have become the basis of the emerging VI technological order. In the economic, political, cultural, social, and other spheres of human life, we are seeing changes caused by information and communication technologies, indicating the start of a new stage of informatization, called the "digital economy" (Golovenchik, 2019).

The digital economy acts as a strategic direction of development based on expanded reproduction with an increasing role of traditional and intellectual resources and increasing their differences (Morozko, Morozko, & Didenko, 2022).

3 THE ROLE OF DIGITALIZATION IN THE ECONOMY

The digitalization process is progressive. It has a positive effect on developing relationships in society and increases the convenience of transactions for all participants: citizens, businesses, and government agencies.

According to experts, digitalization makes it possible to optimize production and logistics operations, increase the efficiency of the labor market, equipment productivity, and R&D efficiency, and reduce resource consumption and production losses (Osipovskaya, 2019).

In the economy, digitalization has become one factor of competitiveness - the higher the level of digitalization, the higher the competitiveness. And this applies to individual companies, industries, and national economies. According to a study by MGI (McKinsey Global Institute, based on the Digital Quotient), enterprises that are more actively adopting digital technologies show higher financial results (Aptekman, et al., 2017).

The COVID-19 pandemic and the massive transition to remote work in almost all countries have stimulated digital transformation processes and increased costs for individual digital solutions that allow organizing remote interaction between employees. (Cekerevac, Dvorak, & Prigoda, 2022)

Most global companies are actively considering the ecosystem business model currently since in the last 5 years it is these companies that have shown the greatest growth in value (Fig. 2).

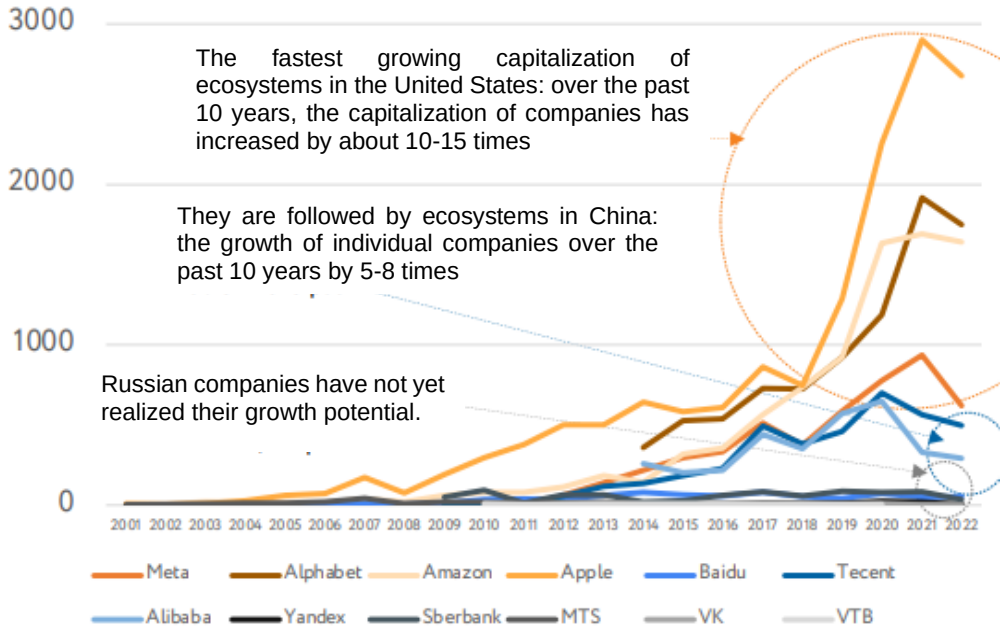

Fig. 2. Capitalization of the largest ecosystems (IEP, 2022)

McKinsey estimates that ecosystem companies could generate $60 trillion in total revenue by 2025, with a potential increase in global economic share from 1 to 2% in 2020 to 30% of global GDP by 2025 (IEP, 2022).

Developing ecosystems can lead to an increase in the rate of economic growth, an increase in the productivity of companies, the innovative activity of companies in the economy, expand international trade, and also affect the labor market, inflation, and other macroeconomic variables.

Table 1. Impact of digital ecosystems on national markets (IEP, 2022)

Index	Influence
Economic growth rate	Growth in economic growth due to direct influence; reduction of transaction costs; firm productivity growth.
Companies' performance	Positive due to reduction of information asymmetry between market parties; the departure of the least productive players and the growth of competition between the remaining ones; reduction of transaction costs in the interaction of players in the market. Negative due to the risk of markets being monopolized by one platform; breaking existing value chains.
Consumer Experience	Possible multidirectional influence: Growth in the number of participants in platform markets due to the emergence of new services, saving time when interacting between market participants online. Improving the usability of services through a single point of access to different categories of services, loyalty programs, and savings through package offers. Reduced user interest in platforms in case of discriminatory personalized pricing, which may discriminate against users based on biased criteria, as well as due to the risk of data loss (including payment data and document data).
Inflation and prices of goods and services	Decrease in inflation in case of increased competition between players and reduced information asymmetry. Increase in prices in case of monopolization of markets and implementation of the winner-take-all effect (typical for non-digital companies as well)
International trade	It contributes to the growth of international trade by reducing the transaction costs of buying goods abroad.
Labor market	Reduces transaction costs and allows companies to transfer part of their services to outsourcing. The development of freelance platforms can lead to an increase in the flexibility of labor supply and demand, a decrease in geographical barriers in the labor market, and an increase in the number of employees by attracting people with disabilities.

However, digitalization brings not only advantages but also certain risks, presented in the World Bank report on the state of the digital economy "Digital Dividends" back in 2016 (World Bank, 2017). Among the positive results of its development, the following were highlighted:

- increase in labor productivity;
- reduction of production costs;
- increasing the competitiveness of companies;
- creation of new jobs;
- better satisfaction of people's needs;
- overcoming poverty and social inequality (which raises doubts).

The risks of digital transformation of the economies of various countries included:

- risks associated with cybersecurity;
- a massive rise in unemployment;
- the growth of the "digital divide" in education, in terms of access to digital services and products, as a result - in the level of well-being between citizens and businesses within countries, as well as between countries.

A careful consideration of the positive and negative aspects of digitalization for the economy shows that negative trends can cause some damage to the quality of life of most of the country's population. In addition, there is a risk of technology being misused and the spread of digital fraud.

3.1 Digital transformation and GDP

In the future, the international competitiveness of countries will depend more on the speed with which digital technologies are introduced into the production process. At the same time, the possibility of implementing digital transformation depends on the availability of the necessary resources for it. In turn, the quantity and quality of available resources largely depend on the achieved level of economic development, measured by the real gross domestic product (GDP) per capita level. Digitalization has a positive impact on the GDP per capita, employment rate, and employment growth. As of the end of 2021, GDP per capita in Western countries had the highest values (Fig. 3) (Kodzasova, 2021).

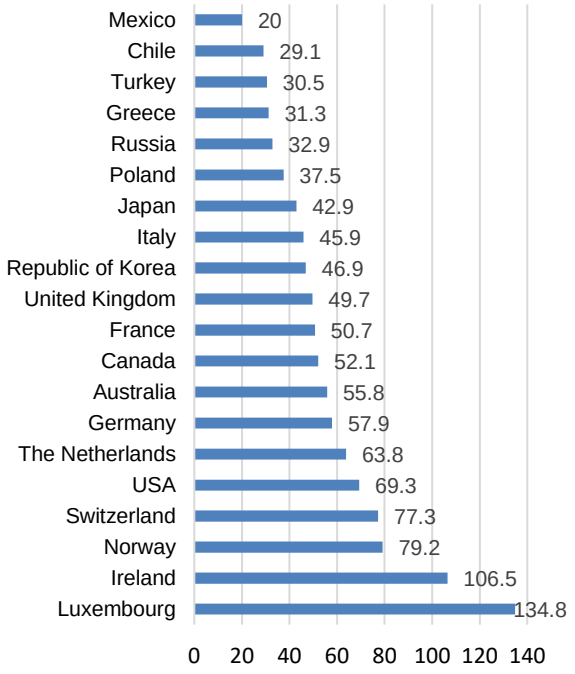

Fig.3. GDP per capita, 2021, in thousand U. S. dollars (Rosstat, 2022)

If these countries continue to develop using digital technologies, they will become even more competitive. And GDP per capita will continue to grow even more rapidly (Kodzasova, 2021).

In connection with the development of digital transformation processes, let us consider its impact on economic growth in countries worldwide based on an analysis of the dynamics of global GDP (Fig. 4).

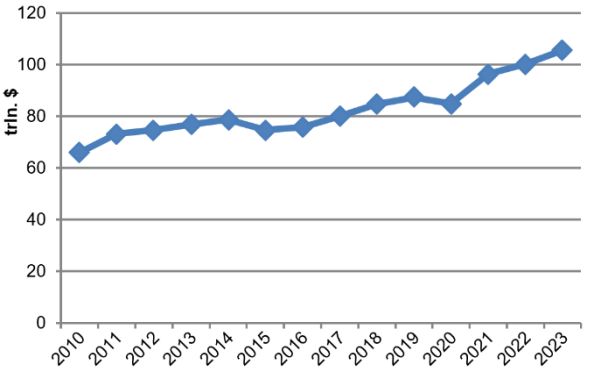

Fig.4 Global GDP for 2010-2023 – Compiled from (iFinance, 2019)

Figure 5 shows the structure of global GDP.

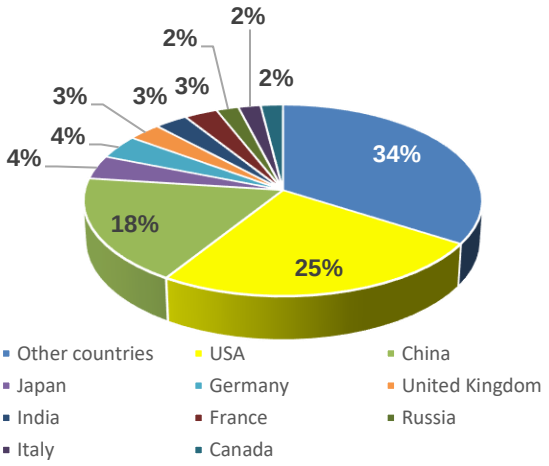

Fig.5. Structure of global GDP for 2022 – Compiled according to (Semenova, 2023)

The presented data imply that, in the period from 2010 to 2022, global GDP had a positive trend. According to the IMF, in 2022, the global GDP of the world for the first time exceeded $100 trillion and amounted to $100.22 trillion. Compared to last year, global GDP grew by 3.4% (iFinance, 2019).

According to the World Bank, in 2022, five countries form the basis of global GDP, the United States, China, Japan, Germany, and India, account for just over half of the global figure (Belyy, 2023).

The United States is the leader in terms of GDP. In 2022, their figure increased by $2.1 trillion and amounted to $25 trillion. The US accounts for almost a quarter of the world's GDP (24.6%). A distinctive feature of the United States is the strong predominance of the service sector in the structure of GDP - it accounts for 80.2% of the indicator, while industry accounts for 18.9%, and

agriculture in the country's structure's GDP takes only 0.9%.

China occupies the second position in the world's GDP ranking. In 2022, the country's GDP grew by $1.4 trillion and amounted to $18.3 trillion. China accounts for 18% of the world's GDP. If it unites the economies of the USA and China, we will get approximately 43% of the world economy.

Japan the world's GDP is close to the top three. The country's economy produced $4.3 trillion worth of goods and services in 2022, which is $0.8 trillion less than in 2021. Japan's share in the world's GDP in 2022 has decreased and is 4.2%. Japan's economy is one of the most innovative and high-tech in the world. The share of services accounts is 68.1% of GDP, and industry - 30.1%.

Germany is the EU's leading economy, accounting for 27% of the Eurozone's total GDP, and is the EU's leading exporter. In 2022, Germany's GDP amounted to $4 trillion, which is $0.2 trillion more than last year. The share of Germany in world GDP is 3.9%. The service sector in the country accounts for 68.6% of GDP, industry - 30.7%, and agriculture accounts for only 0.7%.

The Indian economy in the structure of the world's GDP rose to fifth place. India's GDP in 2022 reached $3.5 trillion, or 3.4% of global GDP, and since 2021, the figure has grown by $0.6 trillion. The main factor in the growth of the Indian economy was a transition from a planned distribution to a mixed economic development model (China had taken the same path in the past). The share of the service sector is 54.3% of Indian GDP, a figure that exceeds that of China and approaches that of developed countries (Belyy, 2023).

Countries that cannot achieve digital transformation are gradually losing competitiveness, and their GDP is declining. That applies not only to economically weak countries but also to those heavily indebted, such as Greece and Italy, and to aging societies in which innovation power and productivity are gradually declining. Many Asian countries in 20 years are characterized by strong economic growth, that is, they have financial resources for digital transformation. This applies to China, South Korea, Indonesia, Thailand, and Taiwan. African countries, although they have a young and growing population and resources, still cannot create a digital infrastructure and promote the education sector, which hinders their economic growth (Kodzasova, 2021).

3.2 Prospects for Digitalization in the Economy

Over the past few years, technology has brought about a digital turnaround in the economy and has significantly changed trade.

Every year, the World Trade Organization (WTO) records the growth of the global economy under the influence of digital technologies. Its growth in 2022 may slow down 2023 as multiple shocks weigh on the global economy. WTO economists predict that the global merchandise trade will grow by 1.0% in 2023, well below the previous estimate of 3.4% (WTO, 2022)

Developing digital technologies has led to such global trends as:

Increase in imports and exports. Because of the emergence of online stores, streaming platforms, and social networks, international trade has become more accessible. Trading platforms create unlimited potential for the sale of goods and services, connecting buyers around the world.

The simplification of financial transactions. Online wallets, blockchain, and cryptocurrencies have made cross-border financial transactions much easier. The speed of transactions has increased, and financial market participants have received inflation protection and a lower commission (n. d., 2022).

The following digital technologies had the greatest impact on the economy in 2022:

- *Blockchain* is a ledger for storing and transferring digital assets, which works in two directions: Buying, selling, and storing cryptocurrency and logistics. Based on blockchain, it is possible to organize document flow in a single digital system of the company. That is especially true for international companies that supply their products to different countries, which increases the supply chain from raw material sellers to points of sale. Blockchain allows them to create a single registry of documents with certificates, licenses, contracts, reports, etc. Also, they can track their products in real time.
- *Livestream shopping* - selling a variety of goods live.

– *VR-reality, augmented reality*, is actively used by brands to reduce the gap between the product and the buyer. With the help of this technology, you can see the subject in detail or get additional information about it.
– *The Metaverse.* That is a new but already actively developing technology. The fashion industry, and for example, the house of Gucci, considers the metaverse as a platform for holding fashion shows and communicating with customers worldwide (n. d., 2022).

When sufficient investment is achieved, digitalization will become one of the main factors of economic growth (Fig. 6).

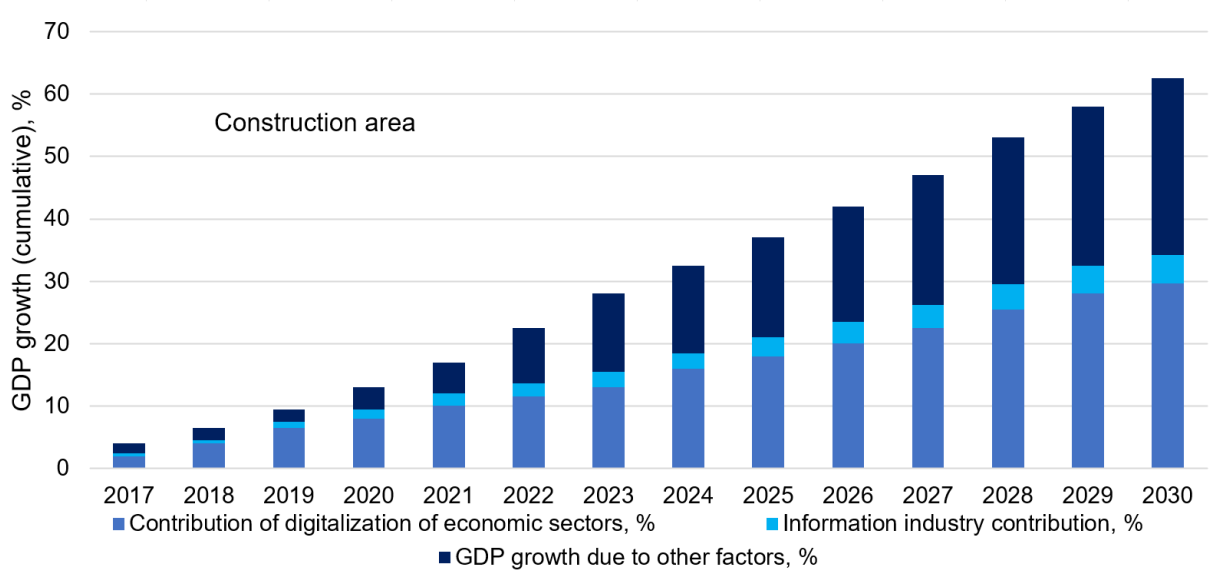

Fig.6. The contribution of digitalization to economic growth (Dranev, Kuchin, & Fadeyev, 2018)

We assume that by 2030, GDP growth of over 50% will be associated with digitalization and will be ensured by developing the information industry and increasing the efficiency and competitiveness of all sectors of the economy. In particular, for 2017-2030, the information industry contributing to GDP growth will be almost 4%, and the digitalization of economic sectors will be approximately 30% (Dranev, Kuchin, & Fadeyev, 2018).

4 CONCLUSIONS

Based on the conducted research, we made the following conclusions. The digitalization of the economy in the modern world has a strong and complex impact on the economy. At the same time, the main trends in digital development are formed mainly by countries engaged in a specific development in the digital sphere and the massive introduction of digital technologies.

The digitalization of the economy and economic growth are interrelated. Countries with a high share of the world's GDP also have a developed digital economy sector, as they widely introduce digital technologies in agriculture and industry. Accordingly, digitalization drives economic growth in the modern world (Iordanova & Cherenkova, 2022).

However, even if digital technologies have proliferated in most countries, the digital dividend - the broader development benefits from these technologies' use is lagging. While digital technologies have often spurred economic growth, created opportunities, and improved service delivery, overall, the cumulative impact of their use has either been much weaker than expected or not dispersed. Overcoming the digital divide is connected, first of all, with the organization of ubiquitous access to the Internet. Also, states need to improve legislation, develop the competition, improve the workers' skills under the digital economy requirements, and ensure the accountability of institutions (World Bank, 2017).

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