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TRENDS IN THE IMPACT OF DIGITIZATION ON ECONOMIC SECTORS IN THE MODERN ERA

Abstract

The post-pandemic period has led to an increase in the urgency of numerous problems and challenges related to digitization. This article first examines the theoretical foundations of digitization, or rather, the approaches of various authors in this direction. The article also examines the dynamics of "total spending on digital transformation technologies and services" and their contribution to GDP. The main goal of the article is to review the literature related to the concept of digitization and comparatively analyze the current trends in the digital economy. The research methodologies of synthesis, comparative analysis, statistical analysis, graphical representation were applied in the article. The article can serve as a teaching material for university students studying digitization. In addition, the article can be used as a relevant resource for young researchers and students in the process of writing research papers in the relevant field.

Keywords: digitalization, digital technologies, digitalization concept, digital transformation, digitalization trends

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Müasir dövrdə iqtisadi sahələrə rəqəmsallaşmanın təsiri tendensiyaları

Xülasə

Pandemiyadan sonrakı dövr rəqəmsallaşma ilə bağlı çoxsaylı problem və çətinliklərin aktuallığının artmasına gətirib çıxarmışdır. Bu məqalə ilk olaraq rəqəmsallaşmanın nəzəri əsaslarını, daha doğrusu, müxtəlif müəlliflərin bu istiqamətdə olan yanaşmalarını araşdırır. Məqalədə həmçinin "rəqəmsal transformasiya texnologiyaları və xidmətlərinə ümumi xərclərin" dinamikasını araşdırılmış və onların ÜDM-ə olan töhfəsi öyrənilmişdir. Məqalənin əsas məqsədi rəqəmsallaşma konsepsiyası ilə bağlı ədəbiyyatı nəzərdən keçirmək və rəqəmsal iqtisadiyyatda mövcud tendensiyaları müqayisəli şəkildə təhlil etməkdir. Məqalədə sintez, müqayisəli təhlil, statistik analiz, qrafik təsvir tədqiqat metodologiyaları tətbiq olunmuşdur. Məqalə rəqəmsallaşma üzrə təhsil alan universitet tələbələri üçün bir tədris materialı rolunda çıxış edə bilər. Bundan əlavə, məqalə gənc tədqiqatçılar və tələbələr üçün müvafiq sahə üzrə tədqiqat işlərinin yazılması prosesində aktual mənbə kimi istifadə edilə bilər.

Açar sözlər: rəqəmsallaşma, rəqəmsal texnologiyalar, rəqəmsallaşma konsepsiyası, rəqəmsal transformasiya, rəqəmsallaşma meylləri

Introduction

The significance of digitalization in modern society is undeniable. A vital element is considered to be one critical factor that plays an important role in promoting economic growth, promoting social cohesion and promoting the long-term viability of a society. The pervasive impact of digital transformation is evident in several areas of society, including business, government, education and healthcare, thanks to advances in technologies such as cloud computing, Big Data, artificial

intelligence and the Internet of Things. The advent of digitalization has greatly facilitated remote work, leading to the transformation of traditional office culture and the development of a globally distributed workforce. The field of e-commerce has experienced significant and rapid growth, leading to a fundamental shift in the retail industry as customer interactions shift to digital platforms. The current trajectory of digitalization trends is increasingly focused on delivering personalized consumer experiences, facilitated by the use of data analytics. Integrating sustainability into digitalization initiatives is evident as organizations use digital solutions to mitigate environmental impacts and reduce carbon emissions. The proliferation of digital education platforms is helping to increase the accessibility of educational opportunities, thereby illustrating a paradigm shift in the methods used to deliver education.

In today's economy, there is a growing trend towards digitalization. The emergence of these developments opens up new prospects both for the corporate sector and for society as a whole. However, it also highlights a number of barriers, including issues around data security, privacy and inequalities in digital access. Digital transformation is known to improve operational efficiency and productivity, leading to lower costs and new opportunities for innovation. This allows businesses and organizations to increase their ability to adapt to dynamic market situations, speed up their response to customer demands and improve the quality of their offerings. Thus, the meaning of digitalization and digital transformation becomes a critical issue that requires more research and debate at multiple scales, spanning local and global contexts.

Overview of approaches to the digitalization concept.

In recent years, there has been frequent contact with concepts such as the digital economy and digitalization. The digitalization process currently plays a significant role in the formation of the information society and affects many social processes. Moreover, advances in this area have implications not only for social realities, but also for the economy at all levels. The integration of digital elements into various aspects of society is a long-standing phenomenon. However, the COVID-19 pandemic, which occurred in the world in 2019–2021, served as a significant catalyst for the digitalization of economic processes due to the mandatory social restrictions introduced (Shalabanova, 2023: 678-681).

The works of Kling and Lamb, published at the end of the twentieth century, argued that the digital economy should be limited to a certain set of goods as well as services, that is, those that are inextricably linked with digital technologies (Kling, Lamb, 1999: 17-25).

At the same time, Brynjolfsson and Kahin suggested that society has not yet achieved a digital economy, but rather is in the subsequent phase of creating a new economy, characterized by the transformative influence of the digital sector, and this process remains incomplete (Brynjolfsson, Kahin, 2002: 372).

It is impossible not to agree with the views of Brynjolfsson and Kahin. It is clear that all these technologies that we see today are not the invention of today and at the same time not the last invention. The readiness of society and the world economy for the achievements of digitalization and technological progress in general will become possible in the next 10 years. During this period, of course, the emergence of new technology models cannot be ruled out.

Balayev et al (2020) in their scientific article examined the impact of the development of the digital market on management systems in general. They noted that the specificity of management in the digital economy is the regular encounter with innovations and the formation of the need for appropriate creative approaches to managing these innovations (Balayev, Bayramov, Gasimov, 2020: 126-128).

Mursalzadeh (2021), who studied the assessment of the digitalization process, noted in his scientific article that the importance of assessment comes from the fact that the result of the assessment is not only the restructuring of economic processes, but also the introduction of significant changes in government institutions. The author argues that gradually traditional structures will lose their significance, and completely new formats of social communication will begin to replace them. The author also adds that “although the impact of ETT has been evident for

decades, the duration of the spread of digitalization products and services is calculated in years (Mursalzadeh, 2021: 318-319)”.

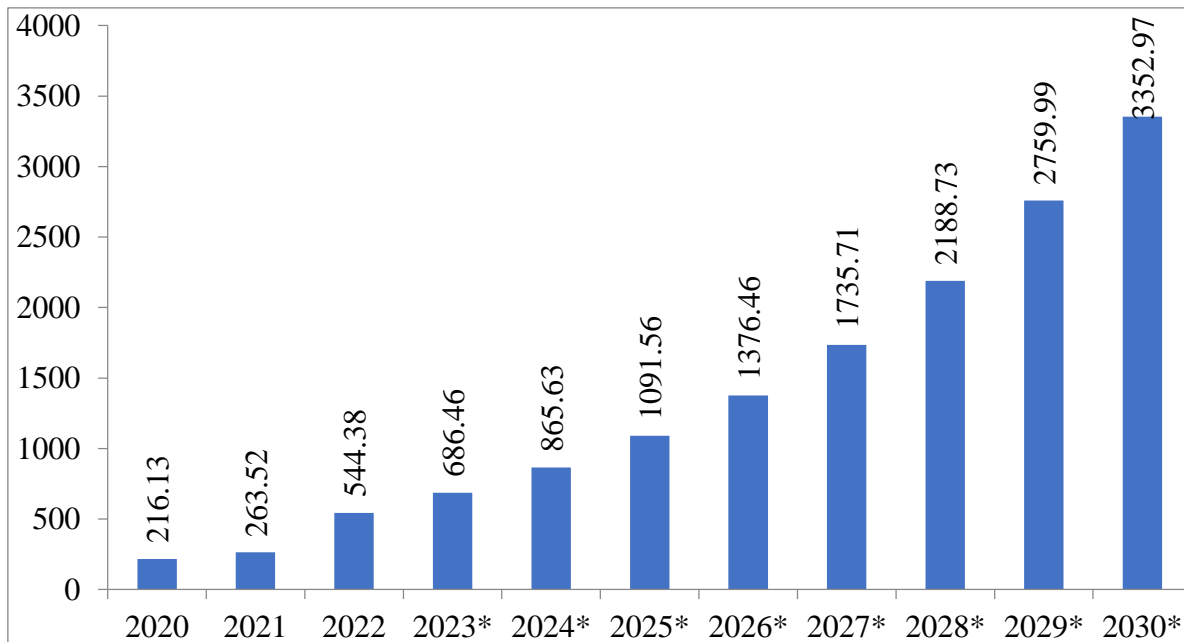
In her research, Panahova (2021) explored issues of social transformation in the context of digitalization. The author noted that digitalization should be considered as a transition to a new stage. The author supported the idea that “If Marx had lived, he would have given the name information to capital” and emphasized the importance of information in the digital flow (Panahova, 2021: 612-616).

Amirov (2021) explored the role of artificial intelligence in digitalization in his conference paper. The author emphasized that artificial intelligence leads to the creation of a flexible work environment and reduced costs. The author also noted that all the work that can be done outside the organization thanks to technology can be done without the need to be physically present in the office and without establishing a stable work schedule. The author especially notes that a flexible work system has a positive effect on the motivation of colleagues in the organization. The author emphasizes the need for many companies that prioritize digitalization to switch to a flexible system of working hours rather than a standard one. The main advantage of switching to flexible working through digitalization is the reduction of the total costs incurred in this direction (Amirov, 2021: 251-252).

Trends in the impact of digitalization on economic sectors.

Digitalization today affects all social processes, forming the so-called information society, and progress affects not only social reality, but also the economy of any level. The digital economy has completely changed both the service sector and the industrial world as a whole. Currently, the world is moving towards digitalization and a digital economy precisely in order to accelerate the rate of economic growth and, accordingly, achieve social change.

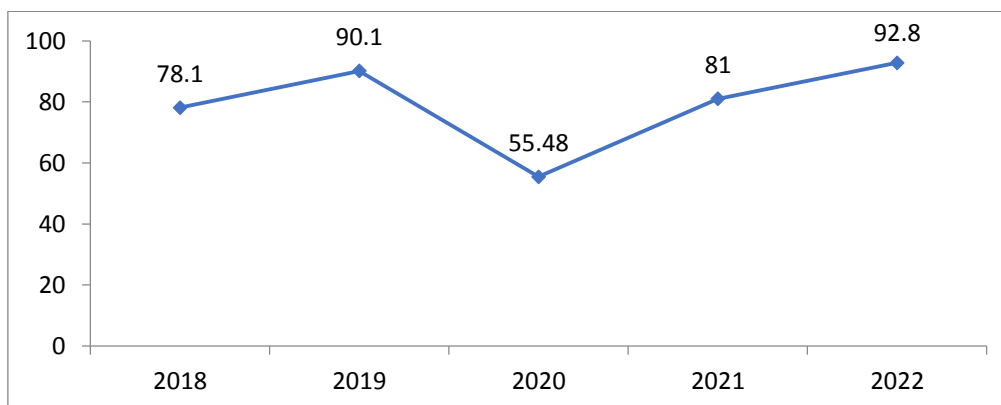
Among the trends in the development of digitalization and the digital economy, it is necessary to note the Internet of Things industry (IoT).



Graph 1. Dynamic change in the overall size of the IIoT market in 2020-2030 (in billions of US dollars) (8).

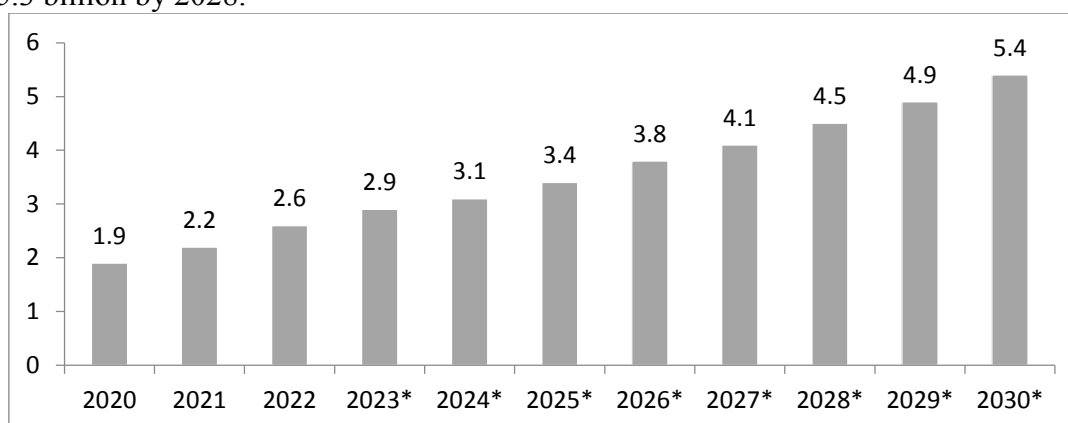
The total industrial IoT market size in 2021 was \$263.52 billion, and in 2022, this figure more than doubled to \$544.38 billion. The main reason for this was the increased digitalization of post-pandemic production, as well as the lifting of a large number of restrictions related to Covid-19 in

almost most countries of the world in 2022. B2B use has the potential to generate around 70% of the value delivered by IoT. The IoT market in agriculture is projected to reach \$33 billion by 2030.



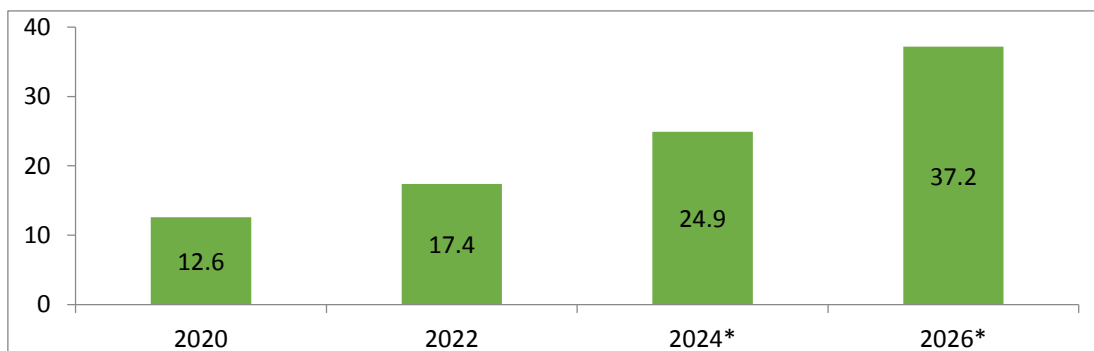
Graph 2. Robot industry market size statistics (in billions of dollars) (9).

It can be seen that if in 2018 the robotics market share was 78.1 billion US dollars, then in 2019 this figure increased by 15.36% to 90.1 billion US dollars. Despite a downward trend of 38.4% during the pandemic, it stood at US\$92.8 billion in 2022. The market is projected to reach US\$165.3 billion by 2028.



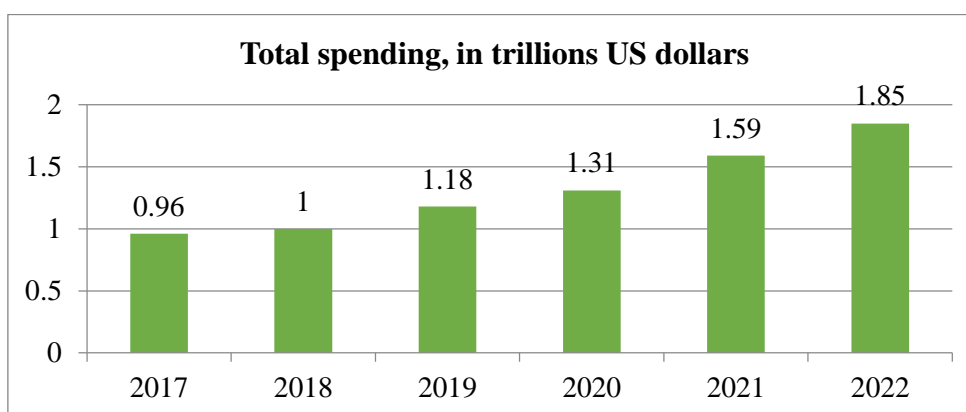
Graph 3. Global market size for food robots in the period 2020–2030 (billion units) (10).

Chart 3 shows the current and projected food robotics market size worldwide from 2020 to 2030 based on time series. As we can see, if in 2020 the total share of the global food robotics market was 1.9 billion units, then by 2030 the corresponding figure is projected to approximately 5.4 billion units. In addition, it should be noted that 3D printing allows us to quickly produce complex parts with high precision, which, in turn, leads to a reduction in production time and costs. 3D printing also allows us to create custom or low-volume products at no extra cost.



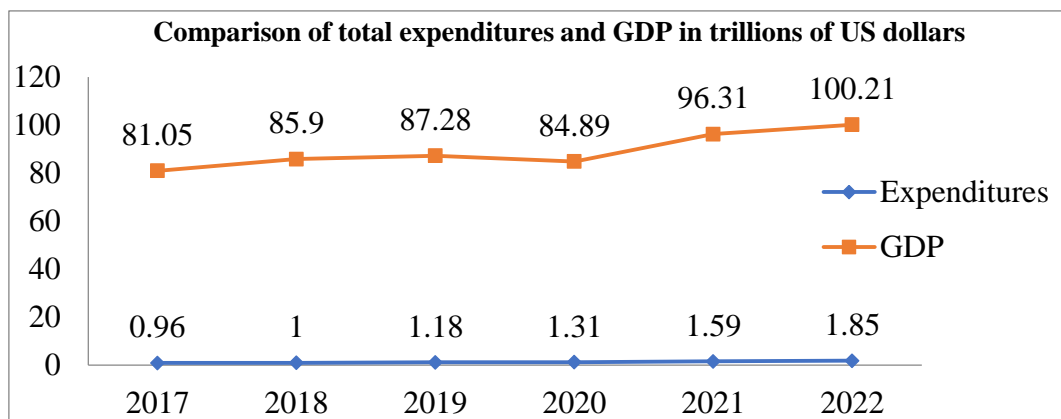
Garph 4. Global market size for 3D printing products and services from 2020 to 2026 (USD billions) (11).

As we can see, if in 2020 the global market for 3D printing products and services amounted to 12.6 billion US dollars, then in 2022 this figure increased by 38% to 17.4 billion US dollars. The forecast for the end of 2024 is \$24.9 billion, for the end of 2026 – \$37.2 billion. The use of 3D printing technology has a significant impact on the digitalization of labor relations, fundamentally changing both production processes and human resource management practices. The introduction of this technology leads to a reduction in both the time and costs associated with prototyping, which affects project schedules and the required level of worker skills. Nowadays, it is extremely important that employees not only have a high level of qualifications in their profession, but also in the field of digital technologies. It is worth noting that the advent of 3D printing has opened up new opportunities for remote work, allowing designers and engineers to work from any geographical location. Additionally, they can conveniently transfer their 3D models to designated printing locations. This phenomenon inherently expands the boundaries of the labor market, making it increasingly globalized.



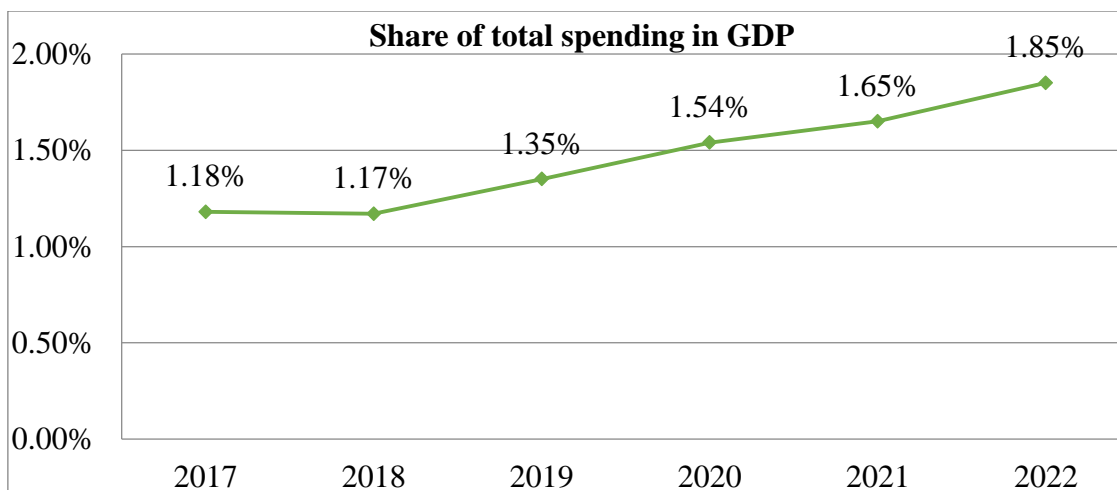
Graph 5. Total spending on digital transformation technologies and services worldwide during the period 2017-2022 (in trillions of US dollars) (12).

Graph 5 shows the evolution of “total spending on digital transformation technologies and services worldwide” from 2017 to 2022. As we can see, the trend of stable growth until 2020 accelerated in 2020 due to the pandemic. While total spending on digital transformation services and technologies was \$960 billion in 2017, this amount more than doubled to \$1.85 trillion in 2022. The indicator in 2022 increased by 16.35% compared to 2021. Let's compare the corresponding indicator with the GDP indicator to determine how high this indicator is.



Graph 6. Comparing total spending on digital transformation technology services with global GDP (12).

As we can see, GDP grew steadily from 2017 to 2019, but unlike spending due to the pandemic, in 2020 it fell from 2018 levels to \$84.89 trillion. Overall, global GDP in 2022 increased by 23.63% compared to 2017.



Graph 7. Share of total spending on digital transformation technologies in global GDP. This chart is based on the information above.

As can be seen, the total share of digital transformation costs in global GDP was 1.18% in 2017, but after the 2020 pandemic, it skyrocketed to 1.85% in 2022. The new digital economy helps improve management efficiency both at the government level and in the business sector. The use of a management system based on big data or simply the use of digital services increases the total volume of processed financial, economic and management information, reduces the processing time of the received data and reduces the response time to problems arising in the management environment, or rather, speeds up the process as a whole. The presented opportunities allow for a more efficient redistribution of finances and resources. This in itself can give such effects as increasing the rate of socio-economic growth for government agencies and society, and for the private sector it is precisely increasing the efficiency of business processes and increasing profits.

Conclusion

The increasing share of digital transformation costs in global GDP in recent years is an indicator of the growing attention of the global economy to technological innovation and digitalization. This, in turn, indicates the rapid growth and importance of the information technology industry, as well as

its impact on the global economy and society at large. This trend also highlights the need for investment in this area to maintain competitiveness and innovation. To continue this trend, increased investment in research and innovation is needed.

Although digitalization has made it easier to automate corporate processes and increased the speed of operations of business entities in a number of industries, it has also led to certain unfavorable results. Unfortunately, employees will not be able to gain digital knowledge and skills in the near future. Because of this, both an increase in the unemployment rate and a fall in workers' incomes are inevitable for some time. In addition, there are other problems with the implementation of digitalization related to the uneven distribution of this trend in different industries.

Overall, I believe that companies should gradually introduce digitalization of their business processes and train their employees to develop digital knowledge and skills. Organizations must do everything possible to integrate digital technologies into their operations.

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