AMERICAN JOURNALS
Open Access, Peer Reviewed Journals

American Journal of Business Management, Economics and Banking
ISSN (E): 2832-8078 Volume 32, | January - 2025

THE IMPACT OF DIGITAL TRANSFORMATION ON INCREASING THE COMPETITIVENESS OF INDUSTRIAL ENTERPRISES

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A B S T R A C T

The article examines the process of digital transformation and its impact on the competitiveness of industrial enterprises. In modern conditions, digital transformation is perceived as an objective reality reflecting social and economic progress. Its emergence is associated with the fourth industrial revolution, which marked the transition to a post-industrial model of economic development. Special attention is paid to the development of digital technologies capable of changing the structure of economic relations, as well as transforming traditional approaches to production processes, interaction with contractors, logistics, financial operations, personnel management, labor productivity improvement and other business aspects. All this leads to an increased role of artificial intelligence in the activities of enterprises.

K E Y W O R D S

Digital technologies, digital transformation, competitiveness, the fourth industrial revolution, industrial, enterprises, production methods.

Introduction

The rapid development of globalization and digitalization in the global economy is contributing to an increase in the volume of innovative products at industrial enterprises and strengthening their competitive positions. Currently, an urgent task is the active introduction of information and communication technologies into industry as a key market tool for increasing competitiveness. The effective development of the industrial sector requires research in the field of rapid data processing, automatic analysis of processes and factors affecting productivity, as well as the integration of information and communication technologies at all stages of production. The use of artificial intelligence to make optimal decisions and increase efficiency is becoming one of the priorities in modern industry.

Information and communication technologies have become a key factor in the socio-economic development of countries. Their rapid development and widespread adoption have significantly transformed various sectors of the economy. At the same time, the development of ICT is largely determined by global challenges and large-scale trends that shape the long-term directions of scientific and technological progress. The leaders of many developed countries recognize the importance of accelerating the transition to a digital economy capable of ensuring sustainable and inclusive growth,

as well as the well-being of society. The digital transformation of business today is perceived as an inevitable component of social and economic progress. Its emergence is associated with the Fourth Industrial Revolution, which became the basis for the transition to a post-industrial model of economic development. According to S. Zahidi, one of the authors of the 2018 Global Competitiveness Report, the successes of the Fourth Industrial Revolution can make all countries more prosperous.[3] The key condition for the implementation of this model is the large-scale introduction of intelligent production. This involves the use of digital technologies in production processes using smart machines, as well as the development of specialized ICT platforms that ensure coordination and management at all stages of the product lifecycle.

Methodology

The methodological basis of the research was the works of domestic and foreign scientists studying digital transformation and its impact on the competitiveness of industrial enterprises. Legislative acts, regulatory documents and materials of scientific and practical conferences devoted to this topic were also used in the analysis process. The research was based on a systematic approach, and methods of logical, comparative, and statistical analysis were used to achieve its goals.

Result and Discussion

The modern digital economy goes beyond the transfer of economic activity to the Internet space. It is based on the deep penetration of information and communication technologies (ICT) into all areas of economic activity: from internal processes in organizations to interaction between companies and individuals who simultaneously act as consumers and representatives of organizations. In accordance with the Decree of the President of the Republic of Uzbekistan dated October 5, 2020, the strategy "Digital Uzbekistan-2030" was approved, which includes the implementation of more than 280 initiatives. These initiatives are aimed at the digital transformation of the country's regions and economic sectors in the next two years.

The document details long-term challenges, including the introduction of digital technologies in areas such as telecommunications, public services, the real economy, healthcare, and cadastral activities.[1] Many domestic and foreign researchers, as well as representatives of large multinational corporations, show great interest in the possibilities of information and communication technologies (ICT) to increase competitive advantages. In her works, E. A. Kashirina [4] analyzes how ICTs transform modern competition in the market, change the structure of existing sectors of the economy, help reduce costs, increase labor productivity, and stimulate the emergence of new goods, services, and business models.

V. Toichkina [7] in his research pays attention to the key determinants of information and communication technologies (ICT) and their impact on international competitiveness. ICT is considered as a relatively new source of competitive advantages for business, which, according to T. Mikhalich and D. Bukhalits, has not been sufficiently studied within the framework of modern theories and models of competitiveness. In his monograph, J. Hu and M. Quaddus emphasize the importance of information systems for the effective functioning of companies. Among the five key competitive strategies are: price leadership, product differentiation, innovation strategy, mergers and acquisitions, and strategic alliances.[6]

According to the International Organization for Standardization, ICTs are a collection of resources,

methods, processes, and tools designed to collect, store, process, transmit, distribute, and use information using software, hardware, and linguistic technologies.

The classical theories of competitiveness presented by the American, British and Scandinavian schools did not sufficiently focus on the role of information and communication technologies (ICT). They viewed ICT as just one of many tools for achieving competitive advantages. This is because most of the research of these schools was conducted in the period from the 1970s to the 2000s, when the level of development and dissemination of information technology was significantly lower than it is today.

The modern world has enormous technological potential, which can become the basis for a qualitative breakthrough in improving living standards, modernizing the economy, infrastructure and public administration system. Declaring 2020 the Year of Science, Education and the Digital Economy, the President of Uzbekistan stressed the importance of digital technologies in all aspects of modern life. In his Message to the Oliy Majlis dated January 24, 2020, he noted that although Uzbekistan scored eight points in the international information and communication Technology Development Index for 2019, the country still lags behind other countries. Building a digital economy requires significant investments in infrastructure, human resources, and financial resources. However, you need to start now, as procrastination may make this transition too difficult in the future. The main task of Uzbekistan for the next five years will be the accelerated development of the digital economy. The degree of development of a country's digital economy is directly related to the development of information and communication technologies (ICT) and is usually determined by various indicators: the share of the digital economy in GDP, the size of investments in the ICT sector, the speed of the Internet, the coverage of the country's territory and its accessibility. [2]

The term “digital economy” was first introduced in 1995 at the Massachusetts Institute of Technology (USA), where Nicholas Negroponte introduced the concept of “electronic economy”. [3]

According to the definition of the World Bank, the digital economy is a system of economic, social and cultural interactions based on the use of digital information and communication technologies (ICT) in the broadest sense. It is also described as a “new paradigm of accelerated economic development”.[9]

Currently, there is no single definition of the digital economy in the scientific literature. Gartner analysts propose its interpretation as the process of creating, consuming, and managing values related to digital products, services, and assets within organizations.[10]

Broadly speaking, the digital economy is the use of information technology in areas such as manufacturing, management, communications, and entertainment. From this point of view, digitalization can be equated to automation, and the term "digitalization" itself does not carry a fundamentally new content. However, the development of digital technologies significantly affects the structure of economic relations, while simultaneously transforming traditional approaches to production processes, interaction with contractors, logistics, financial operations, personnel management and productivity improvement. All this increases the dependence of businesses on artificial intelligence. Since the advent of information technology, the very nature of competition has undergone significant changes. In the digital economy, one of the key areas of companies' work is to manage their competitiveness.[11]

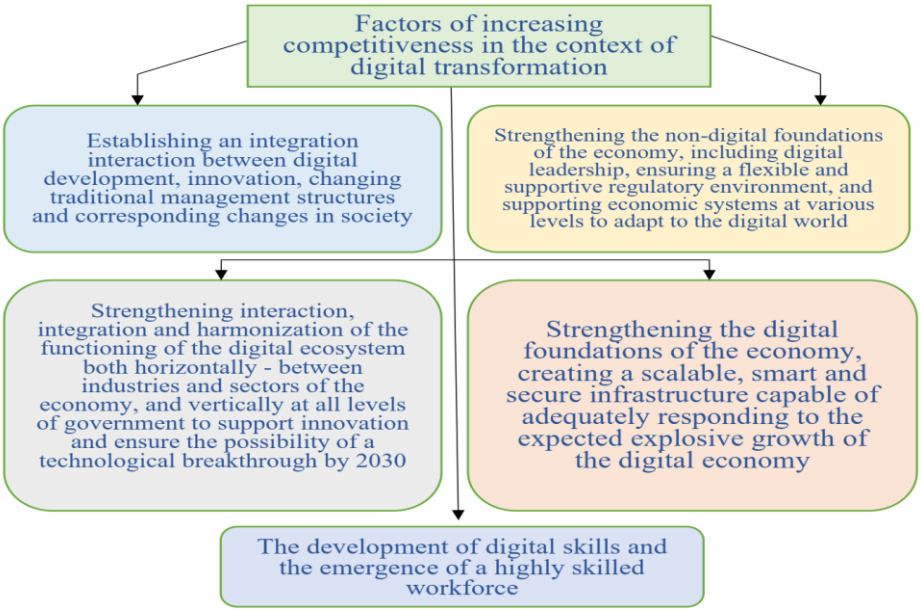
Since 2016, the bandwidth of global data networks has increased significantly, increasing from 55 Gbps to 1,200 Gbps in just a few years. At the same time, the cost of Internet services for providers decreased by 21 times: from 91.5 to 4.3 dollars per megabit per second. Research shows that the increase in the number of mobile and Internet users has been made possible not only by the

development of ICT infrastructure, but also by reducing the cost of Internet access while increasing its speed.

Digital transformation is defined as the process of business changes caused by the introduction of digital technologies. This process affects management practices, operational processes, products, business models, corporate strategies, and organizational goals. This shows that modern digital technologies not only improve and support existing approaches, but also contribute to the creation and implementation of innovations in all areas of activity. Digital transformation includes the stages of digitization of information, data processing in digital format and the integration of digital technologies into the information and communication infrastructure.

The key factors influencing the competitiveness of a company are the effectiveness of its marketing strategy, production facilities, financial operations, as well as the quality and competitiveness of products. In the domestic market, the introduction of digital technologies based on new, non-standard economic and managerial approaches will lead to a complete transformation of domestic companies. They will be transformed into innovative structures capable of successfully competing in the markets. The key elements of production in a digital economy are data in digital format, as well as their processing and use in large volumes. This allows for significant improvements in efficiency, quality, and productivity in various business areas, including storage, sale, delivery, and consumption, compared to traditional management approaches. However, the digital economy cannot be considered solely as a collection of digital companies or as a separate industry. All aspects of an enterprise's activities, including lifestyle, the basis for the development of economic systems, the functional component of the information economy and the new model for the information society, should be based on a well-coordinated infrastructure that ensures the integration of all enterprise systems.

Based on international experience, it can be noted that scientific and technological progress is a key driver of socio-economic development. It helps to increase labor productivity, improve the quality of products and services, and strengthen their competitiveness. Uzbekistan has significant potential to exploit these opportunities. At the same time, the country's industrial complex has unique production features that must be taken into account when introducing new technologies.



Factors influencing competitiveness improvement in the context of digital transformation.

Uzbekistan's industrial sector plays a central role in the country's economy. In recent years, significant changes have taken place in its structure and large-scale reforms have been carried out. To maximize the opportunities of digital technologies, mechanisms are being introduced aimed at developing cooperation between state-owned enterprises and the private sector, strengthening cooperation with scientific and research organizations, rational allocation of resources, as well as the introduction of tax policies that stimulate investment in digital transformation.

At the national level, major programs are being implemented to manage these changes, such as the Advanced Technology Partnership in the United States, Industry 4.0 in Germany, the Factories of the Future project in the European Union, and the Made in China 2025 initiative. These initiatives demonstrate the effectiveness of digital technologies, which makes their use more widespread and in demand in various industries.

In the modern world, the widespread use of the Internet is closely linked to the development and implementation of digital technologies. In addition to acting as a tool for obtaining any information, the Internet has become an effective channel for promoting goods and services, becoming an indispensable business resource. According to forecasts, by 2025, the economic impact of the Internet of Things on the global economy could range from 4 to 11 trillion dollars annually.

Currently, the industrial Internet of Things (IoT) is actively developing, which allows customers and machines to interact through a network. For example, this may include placing individual production orders and connecting machines that fulfill these orders. This relationship ensures autonomous and flexible operation, adapted to the needs of customers. To support human-machine (H2M) and machine-to-machine (M2M) interactions, the information technology industry provides cloud solutions that facilitate the efficient organization of such processes.

The Industrial Internet of Things (PIV), which is part of the Internet of Things ecosystem and is focused on the needs of industrial businesses, is growing in popularity in the manufacturing sector. Personalized Information Technology (PIT) is expected to have a significant impact on the industrial sector, leading to the launch of Industry 4.0, also known as the Fourth Industrial Revolution. Businesses that can effectively apply analytics to innovate and modernize their workforce through the Internet of Things are likely to increase productivity and revenue through the creation of new business models.

According to World Bank estimates, the introduction of ERP systems (enterprise resource planning systems) can contribute to the growth of global GDP by $12 trillion by 2030. The optimal level of the digital economy's share in the global GDP structure is considered to be 7-8%. This share varies in individual countries: in the UK it reaches 12.4%, in South Korea — 8%, in China — 6.9%, in India — 5.6%, in Russia — 2.8%, in Kazakhstan — 3.9%, and in Uzbekistan — 2.2%.

Advantages and disadvantages of using digital technologies in enterprises

Advantages	Disadvantages
- increasing the efficiency of enterprise management; -increasing the flexibility of production through the possibility of its rapid reconfiguration; -information integration of the stages of the life cycle of manufactured products; -the possibility of a comprehensive solution to the issues of optimizing production, improving the quality, environmental friendliness and safety of manufactured products; -reduction of production preparation time; reducing the length of the production cycle; -reducing the number and duration of unplanned equipment downtime, -increase its loading level; -lower operating costs and increased energy efficiency; -increase in labor productivity.	-increasing the level of dependence of production on the digital technologies used; -a significant reduction in the role of personnel in the process of making corrective decisions during the production process; -reducing the possibility of operational influence of workers on production processes; -high cost of digital equipment due to increased requirements for its reliability and stability.

The Republic of Uzbekistan plans to increase the share of information and communication technology (ICT) services in GDP to 5% by 2025 and to 10% by 2030, which is reflected in the draft Concept for the development of the Electronic Government system. Practice shows that the digital economy is one of the key factors stimulating innovation, increasing competitiveness and contributing to economic growth.

Currently, most industrial enterprises in the country operate with a low level of digitalization in the manufacturing sector. While other countries have already consolidated the trend of integrating unified knowledge management systems, using digital platforms and integrated solutions, Uzbekistan is at an early stage of implementing the concept of transition to Industry 4.0. As a result, the domestic industry is inferior to leading foreign competitors in terms of penetration into the finished product market, as well as in terms of price and quality. Similar domestic industrial systems are often unable to ensure efficient production organization and prompt business response to market changes.

To accelerate the growth and large-scale adoption of digital technologies in industry, it is necessary to update the regulatory framework. Clarification of existing laws and, if necessary, amendments are required to ensure business confidence and legal certainty.

In modern conditions, maintaining the competitiveness of an enterprise is impossible without adapting to new economic realities. The introduction of digital technologies, along with advances in management and production, creates the necessary foundation for ensuring sustainability and competitive advantages.

Conclusion

Any process is based on a certain theory and methodology. In the context of the study of competitiveness in the industrial sector, the development of the theoretical and methodological foundations of this field is of particular importance. As practice shows, improving methodological approaches to ensuring the competitiveness of an enterprise is not only an independent task, but also includes an analysis of all its components. This is especially true for the use of information and communication technologies (ICTs), which play a key role in increasing the competitiveness of industrial enterprises in the context of the digital transformation of the economy. An integrated approach to the study of data and related aspects contributes to achieving significant results.

An analysis of the methods of assessing competitiveness proposed by domestic and foreign scientists has shown that at the moment there is no single universal methodology for assessing the competitiveness of companies and organizations. This is due to a number of disadvantages inherent in existing approaches. Among the key problems are the difficulty of compiling a complete and objective list of factors for analysis, difficulties in comparison with other companies due to their constant diversification, as well as the uncertainty of market boundaries.

In the context of the modernization of the country, the digitalization of industrial economic systems takes various forms. At the moment, most manufacturing companies are still in the early stages of digital transformation. Technologies such as additive manufacturing, the industrial Internet of Things, mechatronics, robotics, computing systems, and virtual modeling remain relatively new and under-developed. As a result, locally produced products are often inferior in quality to their main international competitors, have a lower cost and arrive on the market late. In modern conditions, increasing the competitiveness of an enterprise requires taking into account new economic realities. The integration of digital technologies, along with management and production innovations, creates a stable foundation

for successful development and strengthening of competitive positions.

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