

Problems and solutions in digitalization of industrial enterprises in the economy

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Abstract: Digital economy is a new direction in the world economy. Economically developed countries have made significant progress in this direction, while others are advancing in this direction. Digitization of all sectors of the economy is the main condition for integration into the world community, gaining a place in the world market, economic development, and creating conveniences for the population. There have been four industrial revolutions in human history. Each revolution is related to the invention of innovative technologies of that time and its introduction to human activity. As a result, new sectors of the economy appeared, and the state's economic situation improved. At the heart of the fourth industrial revolution were smart factories. In such enterprises, production processes of any complexity can be implemented, minimizing the risk of downtime and ensuring the efficient creation of "smart" products. In this article, from the point of view of digitization of industrial companies, the relations between these sectors and the role of digital transformation in the development of industry, problems in this sector and ways to overcome them are studied.

1. INTRODUCTION

According to the results of analyzes conducted by reputable international organizations, the digital economy will increase the gross domestic product by at least 30%, thus ending the informal economy. The world leader in terms of the share of the digital economy in the gross domestic product is Great Britain - 12.4%. According to a study by analysts of the International Data Corporation published in 2016, the global spending of digital transformation technologies will grow by 16.8% annually and reach 2.1 trillion by 2019. is USD. According to the forecasts of the Accenture consulting company, the use of digital technologies in 2020 will be 1.36 trillion. US dollars or 2.3% of GDP in the gross domestic product of dozens of the world's leading economies. The GDP of developed countries will grow by 1.8% due to the "digital economy", and the GDP of developing countries will grow by 3.4%. [1] Digital economy makes it possible to increase the efficiency of large industrial facilities, increase production, ensure transparency of activity, and reduce product costs. Digital industrialization has become the main driving force in the development of the economy of countries today. In 2019, the digitization of industry accounted for 84.3% of the world's digital economy and 35% of the world's GDP.

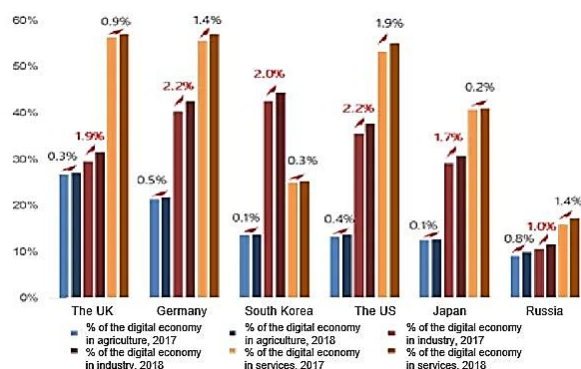
In developed countries, the digitalization of industry accounted for 86.3% of the digital economy. In developing countries, this share was 78.6 percent. The most powerful representatives of developed countries in the field of communication and software are the USA, Germany, Great Britain, South Korea, Russia, and Japan, which were the first countries to engage in e-commerce and advanced manufacturing. is included. Digital industrialization can be divided into sectors and divided into primary, secondary and tertiary categories. According to the type of activity, we can divide them into agriculture, production and service sectors. [1]

2. Materials and Methods

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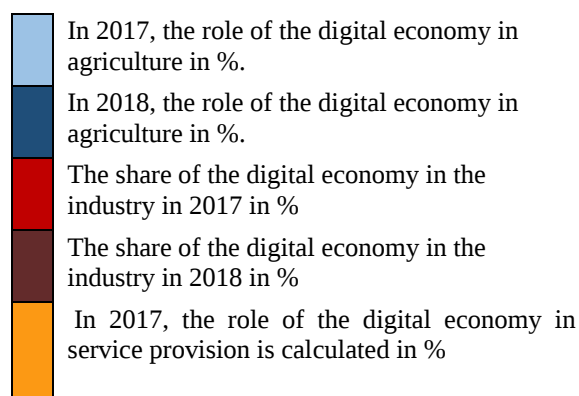
are the USA, Germany, Great Britain, South Korea, Russia, and Japan, which were the first countries to engage in e-commerce and advanced manufacturing, is included. Digital industrialization can be divided into sectors and divided into primary, secondary and tertiary categories. According to the type of activity, we can divide them into agriculture, production and service sectors. Globally, digital transformation in the service sector is occurring at a faster pace than the other two sectors (Figure1).

It mainly depends on the specific characteristics of each sector. Digital transformation in the service sector is easier to implement than in manufacturing, because the service sector has lower fixed costs and higher transaction costs. There are more obstacles to digital transformation in agriculture, because production in this sector is highly dependent on the influence of environmental and natural factors.



Source: China Academy of Information and Communication Technology

Figure 1. Digital transformation in economic sectors



In 2018, the role of the digital economy in service provision is calculated in %

There are two big problems in the field of industrial digitization: telecommunication infrastructure and lack of specialists. This can seriously hinder the transformation of the industrial economy of our Republic into a digital industrial economy and, as a result, slow down the digital economy. On the creation of additional conditions for the development of the digital economy, as well as five priority measures for the development of the Republic of Uzbekistan in 2017-2021, measures for the development of the digital economy in the Republic of Uzbekistan" dated July 3, 2018 PQ - No. 3832 Decree. • Resolution of the President of the Republic of Uzbekistan "On measures to further modernize the digital infrastructure for the development of the digital economy" dated November 21, 2018 PQ - 4022. • PQ-3832 of the President of the Republic of Uzbekistan dated 07.03.03 "On measures to develop the digital economy in the Republic of Uzbekistan" and blockchain technologies with practical skills using modern information and communication technologies In accordance with the objectives of the Strategy of Actions in the direction of training qualified personnel in their development and use, the following was adopted: [2]

• It has become clear that without the training of skilled personnel to succeed in transforming a traditional industrial economy into a digital industrial economy, it is problematic. Therefore, at the initiative of the President of the Republic of Uzbekistan Sh.M. On the basis of Mirziyoyev's Decision No. PQ-3832 of July 3, 2018, a faculty of digital economy was opened at the Tashkent State University of Economics for the preparation of bachelors, and a master's degree was opened for the training of qualified personnel in the field of digital economy on the basis of the faculty of economics and business of the Samarkand State University.

The Fourth Industrial Revolution will transform society and the economy by merging the physical, digital and biological worlds, resulting in a number of intelligent systems with artificial intelligence capable of making fundamental changes in society. The Fourth Industrial Revolution based on smart factories. In such enterprises, production processes of any complexity can be implemented, minimizing the risk of downtime and ensuring the efficient creation of "smart" products. One of the important components of these areas is wireless networks, which cover all processes, machines,

resources and workers, and also allow the exchange of information between companies. The conditional model of the future intellectual enterprise is presented in Figure 2 [3]

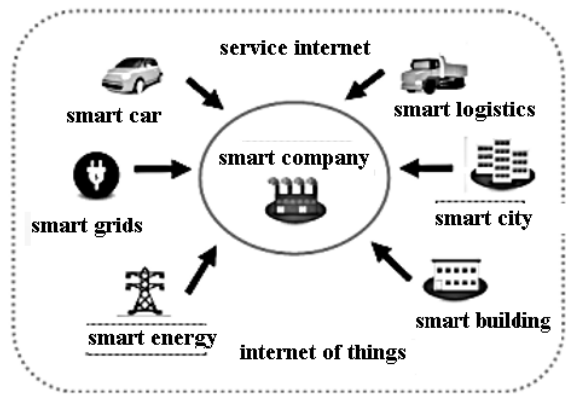


Figure 2. Conditional model of a smart enterprise

All objects included in the public network can exchange data, initiate certain actions and control each other. It simplifies the modernization of production processes, design, supply chain, material use and life cycle management. In addition, Industry 4.0 provides an opportunity to improve the quality, flexibility and reliability of the entire enterprise. The basic technological concept of forming the basis of the fourth industrial revolution and obtaining profit for enterprises - the main nine components of a high-tech product manufacturer are presented in Figure 3.

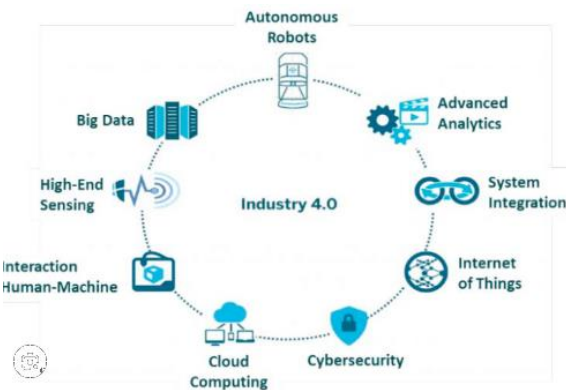


Figure 3.The main components of industry 4

• <i>Modeling;</i>
• <i>Big Data;</i>
• <i>Artificial intelligence, mechanical engineering and robotics;</i>
• <i>Integration system;</i>
• <i>Internet of Things;</i>
• <i>Cyber security;</i>

• <i>Cloud computing;</i>
• <i>3D printing (additional technology);</i>
• <i>Virtual system.</i>

Digital modeling Currently, 3D modeling of objects, materials and production processes is widely used at the stage of new product development. In the future, this technology will be widely used in the production process, which will allow to reflect the physical world in real time from the relevant data in the form of a virtual model that includes equipment, products in production and employees of the enterprise. Big Data (Big Data and Business Intelligence) Analysis based on working with a large amount of data recently presented in the field of industrial production allows to optimize product quality, save energy and increase the efficiency of equipment. Artificial intelligence, mechanical engineering and robotics Industrial robots have long been used to perform complex tasks in large enterprises in various industries. But today's robots are becoming more independent, flexible and controllable than ever before.[4]

Conclusions: The future development of the digital economy will depend on the success of a number of advanced technologies. Five such technologies can be distinguished: • 5G - communication; • 3D - printing; • blockchain; • artificial intelligence (AI); • virtual reality. The listed technologies are one of the most important directions of development defined in the strategic documents of developed countries. The indicated technologies are at the stage of rapid development, they are improving year by year. Each technology can fundamentally affect a number of traditional industries of the economy and business in general. Let's consider the perspectives of selected advanced technologies. 5G - communication - (from English. fifth generation). The fifth generation mobile communication standard (5G) is a new stage in the development of technology, which is designed to expand Internet access through radio access networks.

According to the research of the analysts of "ERGO Research and Advisory" consulting service, the main problem preventing the introduction of ICT in economic sectors until 2020 is the poor telecommunication infrastructure and communication. As a result of low investment, the density of ICT base communication stations was low, which caused the internet and mobile services to not work well. As a result, the growth of the digital economy and its critical infrastructure has reduced industrial growth and created digital disruption.[5]

From January 1, 2020, the tariff for Internet services for operators and providers was reduced by 34% compared to the same period last year, and amounted to 56,000 soums per 1 Mbit/s. The number of Internet service users increased from 22 million, of which the number of mobile Internet users was 19 million. In 237 objects across the republic, trunk telecommunication networks were expanded, telecommunication equipment was modernized, and the transmission capacity of trunk telecommunication networks was increased to 200 Gbit/s at the inter-provincial level, and 40 Gbit/s at the inter-district level.[6]

Digitization of economic sectors in our country is the demand of today's era. In the table below, we can see the changes in the number of enterprises and organizations connected to the Internet in the regions of the republic over the years. (Table 1)[11]

In Surkhandarya region, the number of enterprises and organizations connected to the Internet was 17.7% in 2015, in 2018 this figure was 16.9%, and by 2020 it was 8.5%. The number of enterprises and organizations connected to the Internet in Tashkent is 37.7% in 2015, 44.5% in 2017, and 30.7% in 2020. There are changes in this area, but not enough.

Table 1.

The share of enterprises and organizations with access to the Internet, at the end of the year, as a percentage

Territories	2015	2016	2017	2018	2019	2020
Republic of Uzbekistan	21,6	25,9	27,2	27,5	26,2	21,1
Republic of Karakalpakstan	22,2	23,9	25,0	24,9	24,7	19,7
Andijan	11,0	12,8	18,4	18,1	21,5	16,1
Bukhara	26,1	30,7	30,0	29,7	27,5	21,7
Jizzakh	19,2	23,0	20,8	19,2	19,2	15,1
Kashkadaryo	13,1	20,1	20,5	20,1	18,7	14,9
Navoi	30,7	34,1	33,0	42,5	35,3	31,9
Namangan	12,3	17,9	19,0	23,2	23,3	20,0
Samarkand	16,2	21,7	22,3	22,3	20,8	17,9

Surkhandarya	17,7	17,9	17,2	16,9	13,3	8,5
Syrdarya	17,7	19,6	20,2	19,8	19,7	19,1
Tashkent	18,9	24,2	25,4	25,8	25,4	19,4
Ferghana	17,4	21,8	20,6	20,8	19,2	16,5
Khorezm	20,5	23,8	25,5	27,2	27,4	24,9
Tashkent city	37,7	42,8	44,5	43,2	39,5	30,7

Digital transformation is the process of using digital technologies to improve existing business models and increase operational efficiency through it. This process will lead to full-fledged digital transformation of the entire economy, considering the implementation of innovative technologies on a permanent basis. Digital transformation is a long-term process with five stages: pilot, local expansion, replication, operations management, optimization and innovation. More than 70 percent of all enterprises that have started digital transformation are currently in the "local expansion" and "replication" phase, while only 3.9 percent of enterprises have reached the "optimization and innovation" phase. It will take at least 10 years to achieve full digitization in large enterprises. The implementation of the digital transformation strategy required changes in five areas:

1. Awareness: How we work is determined by two factors: business and technology. We need to focus on business needs, sense those needs in real-time, and take appropriate action accordingly to create value for our customers and users.

2. Culture: creating platforms and sharing resources is a key path to digital transformation, so adapting the culture to support change is critical.

3. Organization: Integrated teams must bring together business and IT staff to implement digitization programs based on a single digital platform.

4. Methodology: in order to lay a solid foundation on the way to digitalization, it is necessary to move to digital objects, processes and rules, and to continue enriching and alternativeizing options for use, solutions.

5. Model: business, operational and management models need to be adapted to digitization goals.

Discussion: As Huawei advances its digital transformation strategy and works to create a fully networked, intelligent Huawei, it focuses on three key areas. Success in this area leads to greater customer satisfaction and increased company efficiency and

productivity. The company explains its strategy as follows:

- Focus on users and communicate their experience to six types of users: customers, consumers, partners, developers, suppliers and employees.

- Business focus – we empower business and IT departments by developing applications and tools that can support complex business architectures (spanning business groups, functional units and cross-departmental interactions) in over 200 different scenarios we help to combine.

- We are using the Intelligent Twins architecture to build an internal digital platform. Huawei cloud services serve as the basis of this platform based on innovative software and hardware products. The platform supports digital transformation by expanding the overall capabilities of enterprises and organizations and by flexibly using and sharing resources in different scenarios.

All digital transformation programs should have the same goal: to support the success of enterprises' core business by providing better experiences, higher efficiency and new models for business growth.

In terms of user experience, Huawei's intelligent customer support services have achieved excellent results. Our system can process up to 4,000 customer calls every minute and handle more than 6 million user inquiries every month. 92.8 percent of requests are processed by robots. Huawei can also manage contracts intelligently. The systems help you draft alternative contracts in a minute, analyze more than 90 types of contract clauses for more than 140 countries worldwide, and provide intelligent reminders about more than 50,000 commercial risks, says Huawei. This is one of the practical examples of industrial digitization that can be used and implemented on a large scale.

Integrating multiple enterprises into a common network is associated with Industry 4.0 applications such as network manufacturing, self-organizing flexible logistics, and a unified machine-building client. With the implementation of these measures, it will be possible to solve problems related to financing, development, reliability, responsibility and protection of IP addresses. Detailed monitoring and documentation of all stages of business processes is provided in real time to control compliance with contractual and regulatory legal conditions. In the provision of individual services, it is also required to comply with the guaranteed and licensed service period and to ensure optimal working conditions for attracting new partners, especially small and medium-

sized businesses. These features of new business models cause unpredictable changes in the world economy and change the market at high speed. New technologies can have a devastating impact on legal issues (such as important corporate information and its protection, liability, trade restrictions, etc.). In addition, the protection of network nodes and general security will also play an important role in Industry 4.0, which will not be enough to provide only at the level of individual components.

In order to implement Industry 4.0 step by step, it is necessary to take the following measures: • In order to work on the basis of real-time CPS - platforms, it is necessary to provide affordable services in the network infrastructure. Strengthening them with international standards and policies both nationally and globally. • Outdated systems should be replaced with new ones designed to work and serve in real time. • Creating fast-growing new business models such as the Internet of Things. • Involvement of employees from the beginning of modernization processes, improving their skills and technical development. • In the transition to Industry 4.0, it must work closely with factory supply systems, which have a longer innovation cycle than ICT networks.

In conclusion, the development of the digital industry is one of the main tools that serve to build an economically-socially, politically strong, democratic state in which the laws of the market economy are fully applicable, as well as to improve the business environment in the country, to facilitate the business activity and simplify its management, and to realize new innovative ideas. is of particular importance. Also, the process of digital transformation of the service sector in the world is rapidly developing, on the one hand, the role and importance of the public service sector is increasing, which has a significant impact on the quality of life of the population. On the other hand, digitalization of certain sectors and activities aimed at providing services to the population affects the loyalty of consumers, saves time, fully satisfies their needs, that is, helps to increase the quality of life of the population. Further development of the digital transformation of the service sector requires clarification of the methodology for assessing the impact of this process on the quality of life of the population.

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