PRODUCTION PROCESSES OF INDUSTRIAL ENTERPRISES IN THE DIGITAL ECONOMY

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Abstract. Nowadays, every aspect of the digital economy is entering our daily life by the hour. In this situation, all enterprises and other business organizations are trying to increase their income sources by using digital technologies. This makes a significant contribution to the development of the economy. As a result, we can see the economic growth of the country, increase in the standard of living of the population and other such changes. We will consider all this in the sequence below.

Keywords : Digital Economy, Digital Transformation, Digital Technology, Industry, Industry 4.0, Artificial Intelligence in Manufacturing, Smart Factory, Internet of Things, Cloud Technologies, Blockchain.

Digital economy is a set of digital goods and services produced and sold as a result of economic activity closely related to e-business and e-commerce based on digital technologies. It is sometimes referred to as the internet economy, the new economy, or the web economy. In 1995, American programmer Nicholas Negroponte coined the term "digital economy". Currently, almost all politicians, economists, journalists, businessmen around the world use this term. The digital economy is not some other economy that needs to be created from scratch. It means moving the existing economy to a new system by creating new technologies, platforms and business models and introducing them into everyday life.

The digital economy has the following characteristics:

- high degree of automation;
- electronic document exchange;
- electronic integration of accounting and management systems;
- electronic databases;
- Availability of CRM (customer relationship system);
- corporate networks.

In addition, the digital economy differs from the traditional economy with the following advantages:

- Costs for payments are reduced (for example, travel to the bank and other resources are saved).
- More and faster information about goods and services.
- In the digital world, there are great opportunities for goods and services to enter the global market.
- Goods and services are rapidly improved due to fast feedback (consumer opinion).
- Faster, better quality, more convenient.

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Digital transformation refers to the use of technology to transform analog processes into digital ones.

The transition to digital technologies has affected all areas of our lives that use artificial intelligence - from smart watches to home assistants.

Digital transformation has changed due to new technologies such as machine learning, big data and the Internet of Things.

The evolution of digital transformation includes:

1. Go digital. Transfer of information and documents from analog to digital.

2. Digitization. Integration of digital technologies into existing business processes.

3. Digital transformation. Integrating intelligent technologies in the company to achieve the best results, increase operational efficiency and optimize business processes.

In other words, digital transformation is a rethinking of how employees work to effectively collaborate with customers through modern technology and data analytics.

Digital technologies (English: Digital technology) are technologies based on displaying signals not in the form of a continuous spectrum, but in discrete bands at the analog level.

All levels of these technologies represent the same signal condition in range. Unlike analog, digital technology works with discrete rather than continuous signals. Also, signals have a small set of values, usually two. In real life, systems, especially accounting systems, are based on three meanings. Typically these are 0, 1, NULL, which in Boolean algebra have the values "False", "True", and "no result" when NULL is present. Digital circuits mainly consist of logic elements like AND, OR, NOT, etc. and can also be connected with counters and flip-flops. Digital technologies are mainly used in digital electronics, primarily in computers, in various fields of electrical engineering, such as gaming machines, robotics, automation, measuring instruments, radio and telecommunication devices, and many other digital devices (Figure 1).

Industry is the leading branch of the national economy that has a decisive influence on the level of development of the productive forces of society. Enterprises (factories, factories, power plants, mines, mines, etc.). Industry forms the basis of expanded reproduction and provides industrial growth.

The implementation of industrial sector reform, structural change and diversification programs, strengthening of the material and technical base, laid the foundation for the development of the republic's industrial production (Fig. 2).

Hududlar	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
O`zbekiston Respublikasi	13 683,8	18 336,4	21 527,8	28 614,1	33 868,5	42 085,5	48 253,8	59 690,4	83 512,6	110 321,0	129348,6	155159,1	145011,7
Qoraqalpog`iston Respublikasi	250,7	334,4	391,4	579,0	699,2	1 051,1	1 088,8	1 209,2	1 815,0	2 377,6	2804,2	2945,6	2393,3
Andijon	3 266,9	3 887,6	4 843,0	6 717,3	7 329,6	7 159,7	5 313,5	9 853,1	21 385,4	26 179,4	27490,4	25823,9	36563,5
Buxoro	764,1	977,2	1 082,0	1 331,8	1 732,7	2 292,0	2 635,9	3 112,1	3 661,3	5 311,1	6701,9	8570,2	4899,6
Jizzax	256,9	312,8	382,6	442,1	573,6	878,1	1 053,4	1 299,5	1 821,5	2 351,6	2992,9	4009,7	4115,2
Qashqadaryo	651,7	815,6	947,8	1 498,2	1 520,5	2 094,3	2 577,2	2 549,3	2 891,7	3 899,8	4947,4	4660,9	3003,5
Navoiy	455,8	568,7	716,5	1 096,1	1 112,2	1 768,6	2 139,2	2 193,6	2 528,3	3 243,4	3896,5	4342,5	3156,4
Namangan	581,8	774,5	968,6	1 113,1	1 413,1	2 098,1	2 413,4	3 090,5	4 135,6	6 030,0	6442,2	8303,8	7696,0
Samarqand	1 412,4	1 736,3	2 070,7	2 484,0	3 242,3	3 829,9	5 079,8	5 919,2	7 848,2	8 745,3	11836,0	14381,9	9896,6
Surxondaryo	290,7	363,6	445,5	537,8	687,7	942,8	985,2	1 068,4	1 218,0	1 601,3	2161,1	2640,6	1733,6
Sirdaryo	252,9	391,3	467,8	669,7	822,7	1 135,3	1 404,0	1 516,6	1 895,2	2 840,3	2812,3	3718,9	2048,1
Toshkent	1 335,3	2 362,9	2 177,1	3 053,3	3 811,0	4 970,1	6 250,0	5 785,5	7 700,9	10 859,0	14517,4	19981,5	18290,8
Farg`ona	1 136,8	1 393,7	1 584,8	1 961,5	2 293,5	2 888,1	3 316,3	3 740,8	4 530,1	7 216,3	10360,9	11763,9	7634,9
Xorazm	346,8	441,1	548,2	682,5	1 151,7	1 764,5	1 671,2	2 374,3	3 904,7	5 673,9	6448,3	8591,6	10277,4
Toshkent sh.	2 681,0	3 976,5	4 901,8	6 446,8	6 382,8	8 731,2	11 700,7	14 275,8	17 840,1	21 997,7	24984,3	35424,2	33302,8

Production of consumer goods by regions (Fig. 2).

The fourth industrial revolution is an industrial revolution that causes rapid changes in technological, industrial and social processes in the 21st century due to the development of

digital technologies in industry. The term was popularized in 2015 by Klaus Schwab, founder and executive chairman of the World Economic Forum, and has since been used in many economic, political and academic articles. Schwab argues that the changes that will take place will not only increase efficiency, but will also bring about significant changes in industrial capitalism.

The global manufacturing and supply chain is revolutionizing traditional manufacturing using modern smart technologies, large-scale machine-to-machine communication, and the Internet of Things. This process leads to increased automation, improved communication and self-monitoring, and the use of intelligent technologies that enable analysis and diagnosis of problems without human intervention.

The term "Industry 4.0" is used to describe the evolution of production that takes place throughout the life cycle of products. It includes production and supply chain and value chain. Industry 4.0 has many stakeholders, including customers. Customers expect increased productivity, and their expectations have a major impact on the entire supply chain.

The main components of Industry 4.0 are cyber-physical systems (CPS). These cyber-physical systems consist of various intelligent components connected through networks. They enable new opportunities in manufacturing, including remote control, smart factories and logistics. Using these technologies allows companies to optimize processes while reducing costs.

Industry 4.0 is an information-intensive transformation of production. It integrates digital technology with big data, real-time data and IoT-enabled industrial assets to create a more efficient and connected ecosystem. Using Industry 4.0 technologies, enterprises can transform their production processes and create new services and business models that take advantage of their connectivity (Figure 3).

Production processes of enterprises using Industry 4.0 (Fig. 3).

While robotics is great for performing repetitive tasks that humans can't perform, it doesn't help with more complex decision-making. This is where artificial intelligence comes in. AI software is very good at working with complex data and using it to make intelligent decisions. Although artificial intelligence has been a part of manufacturing for decades, its adoption has been slow. For example, the first artificial intelligence-based system for manufacturing was introduced in 1964, but was not used by many manufacturers until the 1990s. names are expected. It will increase from 60% in 2017 to 85% in 2022. That's because AI is moving from being used to make decisions to helping workers do their jobs.

A smart factory is a flexible system that can independently optimize the work of a wider network, independently adapt to new conditions and learn from them in real or near time, as well as autonomously start all production processes. Smart factories may operate within the four walls of a factory, but they may also be more widely connected to a global network of similar manufacturing systems, even a digital supply chain.

The real power of a smart factory is to change and grow with its changing needs - changes in customer demand, entering new markets, developing new products or services, and predictive and responsive approaches to operations and technical services. dependent on new processes or technologies or changes in production occurring in near real time. With powerful computing and analytics capabilities (along with building large ecosystems of smart, connected assets), smart factories can adapt to change in ways that were difficult (or even impossible) for organizations to use in the past (Figure 4).

Smart factory production line (Fig. 4).

In a true smart factory, equipment is equipped with smart sensors, so systems can continuously receive data sets from new and traditional sources, ensuring that the data is constantly updated and reflects current conditions. Integrating data from manufacturing and commercial systems, as well as information from suppliers and customers, provides a holistic view of processes occurring both upstream and downstream in the supply chain, which improves the overall efficiency of the manufacturing network.

In the modern digital economy, the production processes of industrial enterprises are undergoing serious changes aimed at introducing innovative digital technologies. This process, known as digital transformation, is aimed at increasing the efficiency and competitiveness of enterprises.

One of the main areas of digitization of production is the introduction of artificial intelligence systems. Machine learning algorithms are capable of analyzing large amounts of data, optimizing production processes and predicting potential failures. For example, an equipment monitoring system using sensors and data analysis can be used to predict possible breakdowns and implement preventive maintenance, reducing downtime and preventing production losses.

Another important component of digital transformation is the Internet of Things (IoT). Connected sensors and devices enable real-time data collection, creating intelligent production lines. This allows for remote monitoring and control of production processes, optimization of resource utilization, and overall production efficiency.

One of the main trends of the digital economy is cloud technologies. The use of cloud solutions allows storing and processing large amounts of data, providing easy access to data from anywhere. It simplifies collaboration and information exchange between different departments of the enterprise, which facilitates faster decision-making.

Industrial enterprises are also implementing augmented reality (AR) and virtual reality (VR) technologies to train employees and optimize production processes. With these technologies, employees can undergo interactive training and engineers can see projections and models in 3D format, which speeds up decision-making and increases the accuracy of tasks.

An important element of digital transformation is the introduction of a supply chain management system using blockchain technology. It ensures transparency and security in procurement processes, reduces the risk of data falsification and optimizes logistics.

Production efficiency in the digital economy also depends on adapting to the concept of Industry 4.0, which includes the digital integration of all participants in the production process. This includes not only technological changes, but also the renewal of enterprise culture, training and the creation of flexible management structures.

In general, the digital transformation of production processes in the digital economy provides enterprises with unique opportunities to increase efficiency, reduce costs and increase competitiveness. However, to realize the full potential of digital technologies, it is necessary not only to implement new systems, but also to change corporate culture, train employees and constantly update strategies according to the rapidly changing digital landscape.

Summary

In conclusion, in today's digital economy, the role of digital technologies in industrial processes cannot be ignored. The introduction of innovative solutions such as artificial intelligence, the Internet of Things, cloud technologies and blockchain will not only reformat production methods, but also create new perspectives for the growth and development of enterprises.

Digital transformation opens the door to optimizing manufacturing processes, increasing efficiency and improving supply chain management. Data-driven approaches help predict failures, implement preventative maintenance, and reduce downtime. This leads to saving resources and reducing costs, which in turn increases the competitiveness of enterprises.

However, successful digital transformation requires not only the introduction of new technologies, but also the flexibility to change corporate culture, train employees, and adapt to rapidly changing market demands. It is important to recognize that this change is not a static process, but a dynamic pursuit of continuous improvement and innovation.

The digital economy gives industrial enterprises the opportunity not only to follow trends, but also to become leaders in their field. They can harness the power of data, automation and integration to create more flexible and efficient manufacturing processes. Thus, the introduction of digital technologies into production is not only a necessity, but also a strategic decision aimed at ensuring sustainable growth and prosperity in the digital era ..

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