NOVATEUR PUBLICATIONS
JournalNX- A Multidisciplinary Peer Reviewed Journal
ISSN No: 2581 - 4230
VOLUME 10, ISSUE 3, March -2024

DIGITIZATION OF INDUSTRY: FACTORS, TRENDS, PROSPECTS

Abdurashid Abdumalikovich Abdurakhimov
Graduate School of Business and Entrepreneurship
Under the Cabinet of Ministers of the Republic of Uzbekistan
2nd Year Master's Student of Business Administration

Abstract
The article defines the main directions of digitization of industry as a factor for the sustainable development of production. A brief overview of the possibilities and risks of the introduction of digital technologies in production, advantages and disadvantages, the origin of digitization and the prospects for its development is given. Because of the study, the main factors of the digital transition of production of the enterprise were identified.

Keywords: Digitization, industry 4.0, digital transformation, technology integration, automation, internet of Things (IoT), Artificial Intelligence (AI), Big data analytics, Cyber-physical systems, Smart manufacturing, Cloud computing, Robotics, Innovation.

Introduction

Industrial digitization, also known as industrial digital transformation, is the process of introducing digital technologies and innovations into industrial processes and operations. This process aims to improve production efficiency, efficiency and flexibility and improve product quality.
Industrial digitization is based on the following technologies and concepts:
Internet of Things (IoT) - connecting various devices and equipment to the Internet to collect information about the state and operation of equipment, which allows manufacturers to remotely monitor and control processes.
Cloud computing - using cloud platforms to store and analyze large amounts of data and access software as a service (SaaS), which allows companies to reduce the cost of IT infrastructure and software updates.
Big data and analytics - collect, store and analyze large amounts of data to identify trends, optimize production processes, predict failures, and make better decisions.
Machine learning and artificial intelligence - application of machine learning and artificial intelligence algorithms to automate processes, optimize production, detect anomalies, and improve product quality.
Digital twins - the creation of virtual models of real objects and processes that allow the testing, optimization and modeling of production processes in a virtual environment.
Robotization and automation - implementation of robots and automated systems to perform various operations, increase efficiency and reduce error risk.
Industrial digitization has the potential to modify the production methods and business models of many companies, adapting them to more flexible, competitive and changing market conditions. Digitization has become one of the main directions for the development of industrial enterprises. Digitalization of industry in Uzbekistan is one of the national goals for the development of the country. Modern industrial production uses digital and computer technologies in all aspects of its work: from direct control and management of the process to business planning and document management. The digital

transformation of industrial enterprises, the technological potential of Uzbekistan in the medium term, includes urgent measures for state support of the industry.

Literature review

In industrial digitization or digital transformation, it is necessary, first of all, to highlight a block containing a general scientific analysis of digitization issues, in particular: the emergence of computers and the social consequences of their implementation; the spread of personal electronic devices; the formation of the internet; the development of methods for processing large data; the beginning of the use D.K.Galbraith [1], E.Toffler [2], D.Bell [3], S.D.Bodrunova [4] et al.

Within the framework of this article, a number of publications on digitization issues in the industry are of great interest. In turn, it can be structured into three levels: firstly, these are works dedicated to the problems of digitizing the economy in the modern world, analyzing relevant global trends, contradictions and prospects. These issues were addressed by K.Schwab [6], V.E.Dementyev [7], E.B.It has been scientifically studied by Lenchuk [8] et al.

Industrial digitization is a process of transition to automated digital production, driven in real-time by intelligent rather than human systems. The essence of digitization is to transfer information to an existing digital environment, which allows you to quickly obtain and analyze large amounts of information.

The concept of digitization is aimed at increasing the speed of decision-making, reducing the impact of the human factor, allowing production processes to be more variable. Thus, it is possible to increase the efficiency and predictability of the results, improve the quality control of products and services provided. The result: a significant increase in profit, competitive capacity, as well as an increase in the market value of the organization.

In conditions of high competition in the market, digital transformation allows you to solve many business problems:

- Production safety - improve product safety and improve its quality;
- Protection against external factors - minimizing unauthorized access to IT infrastructure and hacking attacks, which can affect the continuity of the production process and become a source of dissemination of confidential information;
- Increase the flexibility of the production process and increase the speed of the introduction of new products into the market;
- protection of labor and health of the industry by optimizing the production process.

Industrial enterprises of the 21st century put digital technologies at the first level of their development, which allows them to effectively manage and produce products in a variety of activities, such as production, planning and management, which are an integral part of digital technologies. Cost optimization differs from the emphasis on improving the overall efficiency of technological processes and production, which aims to increase both overall efficiency and productivity. Industrial digitization refers to the transition from manual control to intelligent systems that “see” Real-time production. Digitization involves transferring information to an existing digital form that provides a quick and efficient "tool" for large amounts of information, including text, images, videos, photos, and other digital media. Digitization aims to accelerate decision-making, reduce the human factor and increase the flexibility of production processes.

Among the global trends in industrial digitization in 2023, cloud platforms can be distinguished, first of all, to achieve continuity and optimization of all business processes and to introduce effective solutions to ensure IT infrastructure protection. With their help, industrial companies of various industries and scales have the opportunity to use modern analysis, modeling and virtual technologies for large-scale data processing, data retrieval, storage, processing.

Current trends in digitization are as follows:

Data Fabric (or so-called data matrices). They are an architecture that is built to work with information. It provides the user with a wide range of settings and controls. The process uses algorithms and tools of neural networks, as well as artificial intelligence. Through full autonomy, Data Fabric provides employees with appropriate access to information. This approach does not need to centralize data, it is possible to organize them in their original location and create a data virtualization layer on top of them, through which consumers will have access to this data. Data Fabric does not require replacement of existing infrastructure, but instead adds an additional level of technology on top of existing infrastructure, which deals with metadata management and data access.

Artificial intelligence. Its capabilities are widely used in the field of production. With it, the appropriate level of optimization and automation of product production processes for various purposes is achieved. Artificial intelligence technologies complement production processes, which in general improve the performance of the enterprise and bring it to new levels of competitive capabilities. Artificial intelligence (AI) as of 2023 is one of the most discussed and simultaneously contradictory and ambiguous terms. Indeed, on the one hand, many experts say that the level of development of artificial intelligence technologies in the country is the most important criterion of the technological, economic and military-strategic power of the state, an indicator of competitiveness in high-tech markets. Analysts say that tens of thousands of companies are applying AI technology, thousands of startups around the world are developing solutions based on artificial intelligence, and IT giants are competing for the opportunity to acquire the most successful developers in this area. The artificial intelligence market is estimated by consulting companies at hundreds of billions of dollars.

Cyber security networks. Cyber security - the implementation of all protective security measures for networks, applications and devices in the enterprise. With the right approach, it eliminates the spread of information, ensures complete confidentiality of information and the uninterrupted operation of all systems of the enterprise. With its help, the risk of disruption and success of ddos attacks is minimized.

Metaverse. Being a Virtual digital space, in the future it will be able to provide opportunities for the interaction of employees with themselves and digital objects through avatars. The connection is made using a smart background, VR glasses or helmets, etc. The use of this technology will further simplify the work of the enterprise, make the process of prototyping various projects simpler and faster. Metaverse platforms can be a great environment to test the company's products and services.

Hyperavtomatization. By combining software, machine learning, and automation tools, hyperavtomatization is designed to make it easier for company employees to perform their tasks. The concept includes robotic process automation, artificial intelligence, low-code application platforms, machine learning technologies. They allow fast and relatively inexpensive automation of regular operations, as well as the elimination of interruptions in automated processes.

Digital twins. The presence of a real-time renewable enterprise space and a clear virtual model of its systems allows you to solve many problems: forecasting and planning the development of an enterprise, testing processes without global Investments, identifying problems before starting production, etc.

Digital industrialization has become the main driving force in the development of the economy of states to this day. Developed countries are among the most powerful areas in communication and software, among the countries that are among the first to initiate e-commerce and advanced manufacturing.

Digital industrialization can be distributed across networks and classified into primary, secondary and tertiary categories. According to the type of activity, we can divide them into agricultural, production and service sectors. In the world, digital transformation in the service sector is taking place at a faster pace than in the other two sectors.

In the service sector, digital transformation is more easily performed than in manufacturing, as there are fewer fixed costs in the service sector and higher transaction costs. In agriculture, there will be more obstacles to the implementation of digital transformation, since production in this area largely depends on the influence of environmental and natural factors.

In developed countries, digitalization and growth rates often increase in nearly the same equilibrium in all three sectors. They usually have the advantage of being one of the first to introduce innovations, and they have a solid basis for digitizing the industry. In these countries, many of the networks use digital technologies, their percentage of connection to communication networks is increasing, and they are relatively more equipped with smart technologies.

In conclusion, the ratio of the categories “digitization” and “digital transformation” should be revealed briefly. As can be seen from the above, in general, digitization should be understood as a specific form of scientific and technical progress associated with the improvement of production forces with digital technologies and ICT tools.

References

1. Гэлбрейт Д.К. Новое индустриальное общество. / Избранное, пер. с англ. - Москва: Эксмо, 2008.
2. Тоффлер Э. Третья волна. / 2-е издание. - Москва : Издательство АСТ, 2002. – 781 с.
3. Белл Д. Грядущее постиндустриальное общество: опыт социального прогнозирования. / Пер. с англ. - Москва: Academia, 2004. – 783 с.
4. Бодрунов С.Д. Грядущее. Новое индустриальное общество: перезагрузка. / Монография, 2-е издание, исправленное и дополненное. - Санкт-Петербург: Ассоциация «Некоммерческое партнерство по содействию в проведении научных исследований \, 2016. – 328 с.
5. Коньков А.Е. Цифровизация политики vs политика цифровизации // Вестник Санкт-Петербургского университета. Международные отношения. – 2020. – № 1. – с. 47-68. – doi: 10.21638/spbu06.2020.104.
6. Шваб К. Четвертая промышленная революция. - Москва: Эксмо, 2016.
7. Дементьев В.Е. Промышленные революции и смена технологических укладов // Друкеровский вестник. – 2019. – № 1(27). – с. 5-17. – doi: 10.17213/2312-6469-2019-1-5-17.
8. Ленчук Е.Б., Власкин Г.А., Доржиева В.В., Иванов А.Е. и др. Формирование цифровой экономики в России: вызовы, перспективы, риски. / Монография. - Санкт-Петербург: Издательство Алтейя, 2020. – 320 с.

9. M.U. Kurbanov. The importance of small business and private entrepreneurship in raising the level of employment. European Journal of Business and Social Sciences 7 (5), 665-6718
10. Ш.Э.Отажанов, М.У. Курбанов. РОЛЬ ЭКОНОМИЧЕСКОЙ НАУКИ В ВОСПИТАНИИ ПАТРИОТИЗМА У МОЛОДЕЖИ-Ученый XXIвека, 2016