AJPDIS GLOBAL RESEARCH NETWORK

AMERICAN Journal of Public Diplomacy and International Studies
Volume 02, Issue 05, 2024 ISSN (E):2993-2157

The Importance of Digital Technologies in Improving the Efficiency of Manufacturing Enterprises

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Abstract: In the article, the authors conducted research on the digitization of the activities of the enterprises in order to increase the efficiency of the activities of the production enterprises and developed suggestions and recommendations. They also gave conclusions on the systematic digitization of production enterprises.

Keywords: enterprise, efficiency, effectiveness, system, field, production, program, digital technology, digitization, industrial enterprises.

Introduction.

In the conditions of the transition to the digital economy, the countries of the world are working on the implementation of advanced works on the development of e-commerce, e-commerce, e-government and industry 4.0 complexes. The impact of digital technologies is felt both globally and locally. The digital economy is a rapidly growing part of the global economy as a combination of new productions. New technologies have a transformative effect on some aspects of the activities of well-established business entities.

According to the McKinsey Global Institute (MGI), in the next 20 years, up to 50% of work operations in the world can be automated, and this process can be compared with the industrial revolution of the 18th and 19th centuries. The Industrial Revolution allowed individual countries to achieve incredible rates of economic growth, and for several decades they became the leaders of the global economy.

Currently, during the globalization of the economy and the development of information and communication technologies, the economies of many countries are moving to a new digital form. The digital economy is changing the face and structure of the economy of countries and entire regions. The competition within the network is increasing, the markets are expanding, the competitiveness of the industries of some countries is increasing in the world markets. As a result, national economies are growing.

The digital economy determines the growth prospects of the company, industry and the national economy as a whole. The emergence of digital players has already changed all sectors - tourism, telecommunications, printing, passenger transport [3]. Digital transformation is one of the main factors of world economic growth. According to the calculations of the McKinsey Global Institute [8, 9], in 2025, 22% of China's GDP growth can be achieved due to Internet technologies. And in the USA, the growth of the economy due to digital technologies may be equal to $1.6-2.2 trillion in 2025.

Methodology.

IT-related issues have not avoided possible changes in industrial work. To be clear, there are two issues at the heart of the debate on the digitization of industrial work: the first is the question of the possible quantitative effects on employment, and the second is the structural change of occupational activity and skills. The analysis assumes a broad understanding of the industry. To adequately understand the import of this change process. In general, the concept covers all direct and indirect value creators in industrial operations, from the operational and executive levels of the organization, to the strategic levels of planning, regulation and monitoring, to the lower and middle levels. includes activities. The use of intelligent information and communication technologies and the associated network of people and machines bring many advantages within the company in the manufacturing sector. Data is collected in real time during the entire production process of the workpiece, then recorded at a central control point, stored in production databases and analyzed. In addition, the above-mentioned cyber-physical systems are used, which are aimed at connecting computing performance with physical devices. A device-level coordination function is assigned to devices in the production process, which ensures that production is more efficient in use. With this data, the company is able to measure important parameters of the production process, such as the current production progress, production speed or the relationship between the desired and achieved quality in real time and draw the necessary conclusions.

Results and discussion.

This is not due to the automation of economic forecasts, but only related existing processes, but with the introduction of completely new comprehensive work - models and technologies. Among them - digital platforms, digital ecosystems in deep analyst big data groups, for example, 3D as Industry 4.0 technologies - printing, robotics, Internet of Things.

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In a broad sense, Industry 4.0 describes the development trend of automation and data exchange processes, which includes cyber-physical systems, the Internet of Things and cloud computing.

The Fourth Industrial Revolution, known abroad as Industry 4.0, first appeared in Western countries. In 2011, at one of the industrial exhibitions in Hanover (Germany), the German government spoke about the need for wider use of information technology in production. A specially organized group of officials and experts has developed a strategy to transform production enterprises in the country into "smart" enterprises. Other countries actively developing new technologies followed this idea. The term Industry 4.0 is synonymous with the fourth industrial revolution.

The fourth industrial revolution in manufacturing is a new driver of economic growth, which is associated with the adoption of values and training opportunities that did not exist before. The introduction of technologies in accordance with a comprehensive idea aimed at improving the world around us will help strengthen the global economy and improve the environmental condition of our planet.

The main directions of production transformation are determined by three global technological trends: network integration, intellectualization and flexible automation (Fig. 1). Experts have proposed the so-called cyber-physical systems, or the integration of automated machines and processing centers connected to the Internet into industrial processes (systems that integrate the physical world with the virtual world, CPS). The goal of production is to create systems that can independently change machines when necessary.

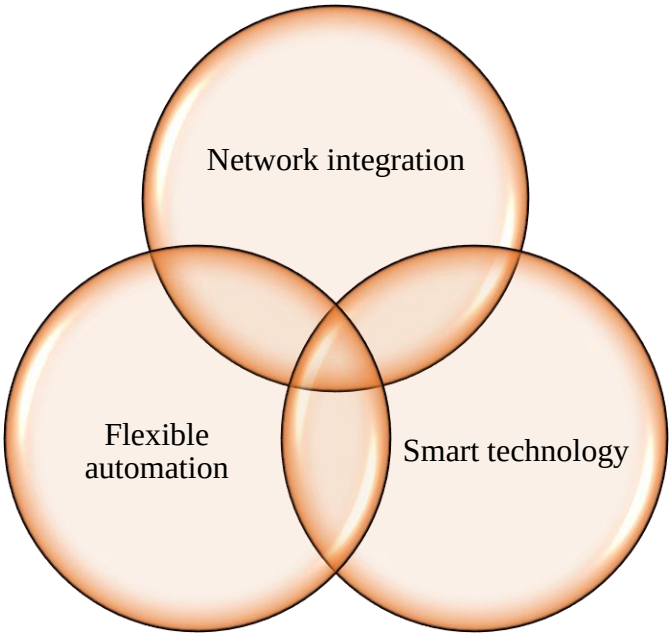

Figure 1. The main global technological trends affecting production

Industry 4.0 will radically change not only the production process, but also the range of services related to the manufactured products. Cyber-physical systems of production fundamentally change the logic of traditional production. Each worker object independently determines what work the production element should do for itself. A completely new architecture of these industrial systems can be phased in through the digital modernization of existing production facilities.

Conclusion

German experts have developed several basic principles for building Industry 4.0, after which companies can implement scenarios of the fourth industrial revolution in their enterprises.

The first principle is interoperability, which refers to the ability of machines, tools, devices, sensors, and people to interact and communicate with each other through the Internet of Things.

The second principle is transparency resulting from such interaction. In the virtual world, a digital copy of real objects, systems of functions is created, which exactly repeats everything that happened to its physical clone. As a result, complete information is collected about all processes related to equipment, "smart" products, production in general, etc. This requires the ability to gather all the data from sensors and sensors and take into account the context in which they are created.

The third principle is technical support. Its essence is that computer systems help people make decisions by collecting, analyzing and visualizing all of the aforementioned data. This support may also include the complete replacement of humans by machines during hazardous or routine operations.

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