



SPECIFIC FEATURES OF THE USE OF DIGITAL TECHNOLOGIES IN THE DEVELOPMENT OF INDUSTRIAL ENTERPRISES

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ABSTRACT

The article examines the concept of digitalization and its role in economic development. It highlights the essence of the digital transformation process, the strategy for implementing this process in the activities of enterprises and ways to implement this strategy, the grouping of digital technologies, the advantages and possible harm of implementing these technologies, the stages and models of implementing a digital enterprise, and provides practical recommendations.

Keywords: Digitalization, digital enterprise, digital transformation, cloud technology, big data, digital transformation models, process model, network model, technology model, matrix model.

Introduction

Effective management of technological processes is of great importance in modern industry and production. Technological processes are complex and multi-stage, and their control and optimization require great attention. Therefore, methods of monitoring and visualization of technological processes serve as an important tool for increasing the efficiency of production processes. At a new stage of development of the world economy, modern digital technologies are considered the main production resource that determines the growth of social well-being.

The general indicator of production efficiency at enterprises is the growth rate of commodity production, in addition, the volume of output per unit of monetary costs,



the ratio of balance sheet profit to the sum of fixed and circulating funds, and full cost indicators are also important. Indicators such as the growth rate of labor productivity, labor savings, and the contribution of labor productivity to the growth of product volume are also used. Production efficiency is formed at the expense of technical efficiency (production volume), economic efficiency (labor productivity, labor resources, fixed funds, circulating resources), and social efficiency (material resources, profit).

The main goal of the digital transformation of an enterprise, in our opinion, is to increase its competitiveness and create conditions for increasing the economic efficiency of production activities. In accordance with the purpose of the digital transformation task, enterprises can be classified as follows:

- organizing the production of competitive products;
- achieving high efficiency, harmonization of production and organizational processes;
- increasing the investment attractiveness of the enterprise;
- increasing the flexibility and transparency of the management system, which guarantees the economic efficiency of the enterprise, etc.

To design the digital transformation of an enterprise, it is necessary to develop a classification of digital technologies according to the criteria of availability and expediency of their implementation at the enterprise. Thus, the main digital technologies are combined into three groups (Table 1).

Grouping of digital technologies ¹Table 1

Naming of groups		
Basic technologies	Important technologies	Advanced technologies
Description of these groups		
technologies that enable digital transformation of these enterprises (cloud technologies, wireless communication technologies, paperless technologies, etc.);	these are technologies that enable the complete digital transformation of the enterprise (big data, cloud computing, unmanned technologies, etc.);	technologies that enable the transition from "analog" to digital enterprise (artificial intelligence, neural networks, distributed ledgers, machine learning, etc.)

¹ Mu'allif ishlanmasi



After a proper assessment of the risks and benefits that the digitalization process may bring, a plan for implementing this process is drawn up. In general, the development of the concept and strategy of a digital enterprise is carried out in the following stages. The digital transformation of an enterprise goes through several stages.

In our research, we will analyze the stages of digital transformation of an enterprise. Developing a digital enterprise concept and strategy involves assessing the level of use of digital technologies in the current state of the enterprise, setting specific goals, and developing a sequence of actions and a strategy based on the goals set.

Data analytics is the process of analyzing data using a multidisciplinary team of experts, and then using the collected data in the organization's work process, making decisions, designing intelligent systems, improving products, and creating new offers and services.

Identifying the necessary resources - in the process of achieving the goal, it is necessary to identify the necessary resources, attract specialists to improve business processes, train them, and develop strategies for introducing new technologies.

Digital replicas of products, processes, and enterprises are developed, creating initial pilot projects to test the viability of the idea and demonstrate business value.

Accelerating digital transformation - one of the challenges facing universities in ensuring the profitability of ongoing projects is to identify a complete concept for a digital enterprise, based on working with leading companies in the field of digital technologies, working with digital startups, and analyzing the experience gained.

Digital transformation is the process of reorganizing a traditional enterprise based on modern technologies, which requires a clear definition of the management structure and functions, strong leadership, responsibility and long-term vision of the management. In this process, it is important to develop a system of motivating employees in order to reduce the likelihood of their resistance to digital innovations. It is also necessary to promote a digital culture. All employees must be able to operate effectively in a digital industrial environment, be ready to try new technologies and learn innovative ways of working with equipment.

To implement digitalization in modern production, horizontal and vertical integration of production systems is necessary, and a significant part of the currently used information systems can exchange information, but their compatibility requires achieving improvement at all levels, both within the enterprise and between interacting enterprises. The creation of a single information space allows for the rapid



and timely exchange of information between automated enterprise management systems and industrial equipment. In digital manufacturing, products can be manufactured to individual orders, so the consumer is a direct participant in the interaction and an important element of the value chain.

Modernization of grain production processes is also a pressing issue in Uzbekistan, with emphasis on increasing productivity and operational efficiency through innovative technologies. World experience shows that productivity can be increased by 20-40% through the use of digital and smart technologies.²

Table 2 Intelligent production systems—the example of grain production³

Year	Traditional production (million tons)	Smart manufacturing (million tons)	Efficiency difference (%)
2019	5,2	6,0	+15,4
2020	5,1	6,3	+19,5
2021	5,3	6,7	+26,4
2022	5,4	7,0	+29,6
2023	5,5	7,4	+34,5

As can be seen from the table above, the introduction of smart production systems has led to a steady increase in grain production. Compared to traditional production technologies, over the period 2019-2023, smart systems have increased yields by an average of 20-35%.

One of the main reasons for this growth is the optimization of production processes, data analysis based on artificial intelligence, and the introduction of real-time monitoring systems. As a result of the use of IoT systems, soil conditions, moisture levels, and plant development processes in the fields are constantly monitored. As a result, resources such as water and fertilizer are distributed more efficiently, increasing productivity.

Widespread introduction of automated agrodrones and GPS-guided techniques in grain production. These technologies allow for increased yields, automation of precise sowing and fertilization processes, and reduction of labor costs. In particular, field monitoring using drones in the USA and European countries is helping to increase yields by 20-35%.

² <https://www.fao.org/smart-agriculture/en>

³ Statistik ma'lumotlar asosida muallif ishlanmasi



Widespread implementation of smart irrigation systems and optimization of water resources. Smart irrigation systems that monitor soil moisture and climate conditions in real time help to save water and maintain stable yields. According to research, such systems can reduce water consumption by 30-50% and increase field productivity.

Optimization of agricultural product logistics and supply chains using digital technologies. Losses and operating costs can be reduced by improving the processes of storing, transporting and delivering grain products to the market based on artificial intelligence. Electronic tracking systems allow for automatic monitoring of the direction of products.

Training personnel adapted to new innovative production technologies and developing research centers. For the effective use of smart agricultural systems, special personnel training is necessary. Strengthening cooperation between farms and research institutes will allow adapting new technologies to local conditions.

Ensuring product certification and transparency by introducing blockchain technologies in agriculture. With the help of this system, the origin of products, growing conditions and supply processes can be accurately monitored. This will increase the export potential of grain products and strengthen confidence in the domestic market.

Developing a sustainable development strategy for grain production using green energy sources. Using solar and wind energy, it is possible to reduce energy costs in agriculture and ensure environmental sustainability. In a number of European countries, such systems are helping to reduce energy costs for farms by up to 40%.

Conclusions and Suggestions

The tasks of information technology specialists and quality specialists not only coincide, but also complement each other in their daily work. This is especially evident when solving tasks related to the reorganization or complex implementation of information systems and technologies at enterprises. The main stage in solving such problems is the description of the production stages, which subsequently form the basis of the organization's quality management system. Such processes and production stages are the foundation of the organization. As a rule, when the external environment changes, the means of collecting and analyzing information about these processes change, and the processes themselves do not change or change insignificantly.



In conclusion, it is worth noting that the introduction of digital technologies into economic sectors has brought a number of advantages, which are reflected in the following: as a result of the automation of the activities of enterprises and the achievement of complete digitalization of the process, competitive products are produced, production and labor resources are used efficiently and economically, the investment attractiveness of enterprises and the transparency of the production process are ensured.

Therefore, the following are proposed to implement digital transformation in enterprises:

1. to have a team of highly qualified workers with the necessary competence in the labor process;
2. to develop a set of methods, techniques and measures that allow for the most effective integration with innovative labor tools and objects, taking into account the current conditions and time;
3. Based on the need to increase the pace of digital transformation of production, it is necessary to establish active cooperation with interested organizations and enterprises, specialized higher educational institutions, and vocational schools.

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