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«Пермский национальный исследовательский
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**АКТУАЛЬНЫЕ ПРОБЛЕМЫ ЭКОНОМИКИ
И УПРАВЛЕНИЯ НА ПРЕДПРИЯТИЯХ
МАШИНОСТРОЕНИЯ, НЕФТЯНОЙ
И ГАЗОВОЙ ПРОМЫШЛЕННОСТИ
В УСЛОВИЯХ ИННОВАЦИОННО-
ОРИЕНТИРОВАННОЙ ЭКОНОМИКИ**

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Актуальные проблемы экономики и управления на предприятиях машиностроения, нефтяной и газовой промышленности в условиях инновационно-ориентированной экономики : сборник материалов X Междунар. науч.-практ. конф. – Пермь : Изд-во Перм. нац. исслед. политехн. ун-та, 2021. – 218 с.

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Представлены доклады секционных заседаний X Международной научно-практической конференции «Актуальные проблемы экономики и управления на предприятиях машиностроения, нефтяной и газовой промышленности в условиях инновационно-ориентированной экономики». Рассматриваются проблемы экономики, менеджмента и маркетинга предприятий машиностроения, нефтяной и газовой промышленности, а также проблемы повышения конкурентоспособности с учетом специфики протекания инновационных процессов на микро-, мезо- и макроэкономическом уровнях. Кроме того, обсуждаются вопросы государственного и муниципального управления экономическими процессами, связанными с инновационной деятельностью предприятий, определяются меры по координации деятельности вузов и бизнес-структур.

Предназначены для студентов, аспирантов, специалистов в области управления экономикой предприятия и государственного управления.

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ТЕОРИЯ И ПРАКТИКА ИННОВАЦИОННОЙ ЭКОНОМИКИ

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DIRECTIONS OF DIGITALIZATION OF ACTIVITIES OF ENTERPRISES OF UZBEKISTAN

This article discusses the main problems of virtualization and suggests ways to digitalize the activities of enterprises in Uzbekistan.

Keywords: digital economy, information and communication technologies, digital technologies, virtualization, digital factory, digitalization, digital design, Industry 4.0, business model.

Introduction. Trends in the economy of industrially developed countries indicate that the processes of digitalization bear a global character. The introduction of a new generation technology will allow to consider the development of the digital economy (DE). It includes a diverse economic activity, in which the use of digital information and knowledge takes the leading place in the manufacture of a product. Summarizing the experts' opinions representing major international organizations, it is possible to identify several primary trends that will have a significant long term impact on economic growth indicators [6, p. 18]. They include: cloud computing; the Internet of things; artificial intelligence; robotics; block chain. It is these trends that serve as the basis for the fourth industrial revolution. These sectors are related to DE, which is based on

the use of digital Internet technology in the process of production of goods and services and their trade. In addition, the main trends are considered to be the efficiency of innovative management tools, rapid change of business models, the use of smart sensors for the entire product line, as well as analytics using all the data masses. The widespread adoption of digital technologies increases competition in global markets and encourages leading industrial parties to pursue joint industrial policies, as well as increase investment in research.

Problem statement. It is important to note that the use of digital technologies in the economic and social life of society leads to an increase in economic efficiency and a significant increase in the life of the world's population. Taking into account the current world trends in the development of DE in production processes, it is difficult currently to carefully assess the degree of digitalization of domestic commercial enterprises in the republic. Issues of digital processes were studied in the works of foreign and Russian scientists such as Tsvetkova L.A. [12, p. 140], Melekhin V.D., Okorokov R.V. [8], Tolstykh T.O., Shkarupeta E.V., Shishkin I.A. [11, p. 118]. and others. The success of government digitalization programs primarily depends on the digital transformation of traditional industry, the development of human capital, the digitalization of state services, and the development of digital infrastructure. The company's management needs to understand that digitalization is a long-term process that requires significant investment and constant updating. The most important factors include the creation of an infrastructure that unites all state bodies, and a single platform for state organizations to provide services to the population.

Evaluation of the modern ICT implementation rating at the enterprises of the republic [10, p. 50], as well as carried out numerous scientific studies have shown that the main digital activities include:

- lack of funds for the purchase of ICTs from enterprises;
- lack of ICT specialists;

- misuse of ICT;
- staff resistance for the implementation of ICT;
- inadequacy of knowledge, skills of employees of the enterprise;
- lack of need for ICT;
- non-use of ICT by partners;
- the uncertainty of benefits;
- weak protection and safety of the available information;
- discrepancy of PC;
- slow introduction of electronic services;
- the lack of mechanisms for transferring documents from paper to electronic form;
- the presence of technical and organizational shortcomings and difficulties;
- the difference between social status and age-related generations (not all workers can use electronic services to the same extent);
- the rigidity of employees and others.

Research Questions. The most important and significant postponing factor of the active implementation and use of modern ICTs is the lack of money. The next significant factor is the lack of qualified ICT specialists at the company [2, p. 3]. Among the most important factors are the lack of knowledge and skills among the employees of the enterprise, the misuse of ICT and wasting of working hours. There are some technical and organizational inadequacies, which cause the problems of significant importance. In almost all cases, the formed infrastructure of the electronic interaction is inadequately controlled and have limitations on the development.

The main factor retaining digital development includes the following:

- preservation of digital resolution as a part of telecommunications infrastructure;

- insufficient public confidence in digital documents and services, as well as their enforcement in state bodies and the judiciary power;
- lack of highly qualified specialists in the field of digital technologies, due to their outflow;
- inefficiency, lack of transparency and elusiveness of state financing of digital technology implementation, as well as the lack of mechanisms to encourage the attraction of extra-budgetary funds, especially in the context of regional development of the country;
- diversity and fragmentation of state information systems and resources.

It should be emphasized that widespread and active implementation, as well as the use of digital technologies in the industry and service sector can significantly improve the efficiency of production processes and services, ensure the safety of efforts, and generate new revenue sources by changes in business models of the enterprise. The experience of developed countries shows that in order to switch to modern digital production, an enterprise needs to consistently implement its systems that support the best management methods for the business integration horizon, then build vertical integration and only then fully switch to robotic digital production. It is also necessary for all production companies that digitalization of production refers to the way of organizing production, which is radically different from the former management, production and cooperative processes. It is also worth noting that the transition to digital production requires the creation of new products and goods, opportunities for commercialization, interaction with consumers and customizers, as well as flexible production. A new digital business model of an enterprise is formed after determining the product and consumer, as well as determining the production manufacturing techniques (business processes), participants and the sector the enterprise influence on (structure) [9, p. 71].

Indeed, the most important economic changes can be made completely through the digitization of traditional sectors, but not

through the appearance of new scenes with the digital support. The analysis of relation of investments and policies to technology or infrastructure, or rather it helps or limits the occurrence of DEs, is necessary to understand the consequences of DE's development. Since digital technologies are at the heart of all the greater number of transactions, generally, the DE is becoming more and more inseparable from the functioning of the economy. The different technologies and economic aspects of the DE can be divided into three components:

1. Key aspects or fundamental aspects of the DE, which include fundamental innovations (semiconductors, processors), core technologies (computers, telecommunications devices), and supporting infrastructures (Internet and telecommunications).

2. Digital and information technology sectors that produce key products or services based on basic digital technologies, including digital platforms, mobile services, and maintenance services. The DE is significantly influenced by the innovative services in these sectors, which makes a growing contribution to the economy, however leads to potential side effects on other sectors.

3. A wider set of digitizing sectors, includes mostly used digital products and services (for example, for EC). Even if the changes are gradual, many sectors of the economy will be digitized. This includes digital technology sectors in which new types of activities or business models have appeared, which are transformed in the result of digital use. Examples include finance, media, tourism, and transport. Moreover, digital or calibrated work, consumers, buyers and users who have a crucial value for the development of DE are distinguished.

Let us consider several examples of a positive experience and ways of borrowing the processes of digitalization of industry. Since 2008, the British mining company Rio Tinto, which transports iron ore to four mines in Austria, has implicated an autonomous control system of dump trucks [1]. This allows unmanned trucks to operate at least 500 additional hours per year, on average 12 % more pro-

duction and the transportation cost is 13 % less. To increase efficiency, it is necessary to include the absence of the need to train operators, improve their skills, train newcomers due to staff rotation, etc. In Austria, the «Production of the future» program covers up to 50 % of the cost of creating fashionable digital factories «Industries 4.0», which are made for the further demonstration of the possibilities of new technologies in production for private businesses. In Germany the industry 4.0 platform was created in 2013 and it aimed to create conditions for the transfer of industry 4.0 technologies to SMEs, cybersecurity, regulations, demonstration of best practices, standardization in the field of industry 4.0, etc. In Russia, special attention is paid to four areas of innovative development: restructuring of existing infrastructure, using in PDM production (product data management) and PLM (production lifecycle management) and implementation of analytical systems. In the United States, the «Manufacturing USA» program is being implemented to create up to 15 research institutes for the development of innovations in data processing (IMI) in such areas as sensors, optics and photonics, materials, artificial intelligence, robotics, modeling, additive manufacturing, ZB-printing, and etc.

Research results. The analysis showed that digital factories, digital design, and so on are tools that help create competitive products and production systems. A key priority is considered the ability to change quickly. To change effectively and purposefully, it is necessary to learn how to build virtual models of products and production systems. Virtual design provides answers to basic administrative questions: what opportunities and limitations are there due to resources, competencies, processes, and products; what opportunities need to be strengthened, and what restrictions should be removed; what must be focused on and what can get the greatest effect; what must be changed, replaced, and what kind of result is achieved; how the engagement of competencies, distributed resources, and network structures is organized. This understanding

forced researchers to create information technologies to manage changes [4].

Foreign experience of digitalization of production shows that computerization of production, operation, management and services in agriculture transforms the model of agricultural product turnover, stimulates the development of industrial parks and electronic trade of agricultural products, accelerates the demonstration and dissemination of digital technical achievements in agriculture, leads to economic development of rural areas thanks to their specifics. Digital factories and digital design are created by tools that help create competitive products and production systems. In digital factories, the ability to change quickly and learn to build virtual models of products and production systems becomes a key priority. Digital design is responsible for the following administrative questions: what opportunities and limitations are there in terms of resources, competencies, processes, and products; what opportunities need to be strengthened, and what restrictions should be removed; what should be focused on and what can be most effective; what should be changed, what should be replaced, and what should be done as a result; how the engagement of competencies, distributed resources, and network structures is organized. This understanding forced researchers to create information technologies to manage changes [4].

Conclusion. The research shows that the implementation of the set of measures for technological re-equipment, which includes elements of the fourth industrial revolution, allows industrial enterprises to reach a new level of competitiveness in order to increase labor productivity, expand the range of products and develop new enterprises-models based on digital technologies.

Thus, we developed a complex strategy of digitalization (to provide access to information and communication infrastructure to improve the quality of life of all segments of the population, to develop skills and competencies of the population, with the objective of empowering the benefits of digitization to improve competitiveness and the productivity of key economic sectors and to stimulate

domestic use of digital technologies in all sectors, create an open state and to provide population and business with qualified public services (compatible with their needs), focusing on training highly qualified professional personnel for the modern IT market, innovative development and accelerated technological renewal. Digitalization of industry can lead to the increase of productivity, improvement of quality and reduction of production costs, increase of investment implementation efficiency, and rapid withdrawal of new products to the market [3].

Thus, statistical assessment of the use of modern ICTs allows monitoring the level of ICT development. In order to change the situation, enterprises need a staff with relevant professional knowledge, have agreements with leading technology suppliers and use the most modern and effective software.

It should be admitted that nowadays any company, regardless of the form of ownership, sectoral allocation, size, and other characteristics, can not only actively use the Internet, but also get a lot of success there. In order to properly evaluate the possibilities of using and benefits of the Internet, we suggest developing and adopting some rules and axioms:

1) it is a mistake to assume that a stable competitive advantage can be obtained solely from access to the Internet or the development of a web site. Every business needs to learn the rule that simply using a business tool that everyone has does not allow you to gain a distinct competitive advantage. Previously, it was believed that the Internet has the destructive potential of some of the traditional advantages that exist in individual products. However, it becomes obvious today the vast majority of company develops web sites and uses Internet resources, and its absence creates a competitive disadvantage in the work;

2) it is necessary for the industries to understand the long-term use of the Internet and its application doesn't give them opportunity for momentary success and an increase in the annual income

of the enterprise, although some may receive the assigned additional profit;

3) none of the existing problems can be solved on the basis of the web site or access to Internet resources;

4) using the Internet is not a guarantee that the company does the same thing that it did before on the Internet, but with less expenses;

5) the use of Internet resources aims any enterprise to solve the problems concerning information security. It is of paramount importance for the enterprise when Internet resources appear as a serious impetus for business development;

6) in terms of priority needs on the Internet, they can be divided into two groups:

– products manufacturers and wholesale stores which want to sell products in large volumes to other manufacturers and participants;

– entrepreneurs who want to sell the product to end users in smaller volumes.

These groups differ significantly among themselves, due to the difference of purposes of using the Internet, including marketing activities.

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**АКТУАЛЬНЫЕ ПРОБЛЕМЫ ЭКОНОМИКИ
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МАШИНОСТРОЕНИЯ, НЕФТЯНОЙ И ГАЗОВОЙ
ПРОМЫШЛЕННОСТИ В УСЛОВИЯХ
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ЭКОНОМИКИ**

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