

Industry 4.0 - new challenges for production



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Introduction



- Accelerated development and emergence of new technologies leads to the formation of innovative concepts of production organization, ensuring that the opportunities of the industry meet the growing and constantly changing needs of society. The necessity of flexible adaptation to the conditions of the external environment demands the maximum possible reduction of time for the realization of operations and, consequently, the overcoming of the gaps between the modern state of industry and digital production. Subversive innovations and exponentially increasing digitalization of processes are actively changing business models of enterprises. Within these conditions such terms as Industry 4.0 concept, digital economy, "smart" economy, Internet of things, cyberphysical systems, supercomputers, digital transformation, digital society, "smart" cities and others are used to describe the directions of development.

Problem statement



- The problem statement is situation when digital economy defines an absolutely new stage of development, which provides a transition to knowledge economy, where the main factor of development is human capital (knowledge, skills, abilities and capabilities of the workforce). Digitalization of economy is realized by means of development and introduction of innovative digital technologies on a constant basis, and also formation of corresponding legal, social-economic, organizational and other conditions of transformation of society and economy to a new level of development. The main research questions are the analysis of the features of the concepts of Industries 4.0 and the main problems of business transformation in the digital economy. The purpose of the study is to analyze in detail new challenges for Russian digital production. The main research methods are analysis, synthesis, comparative analysis, statistical analysis, economic analysis.

Findings



- One of the major obstacles to the formation of the digital economy is the lack of awareness of business entities about the concept and technologies of Industry 4.0, the advantages and challenges of its implementation. Besides, the process of development and implementation of the technologies shown in Fig. 2 requires considerable investments, which at the moment is a serious problem for the Russian economy. It is necessary to organize financing simultaneously in several directions: development of infrastructure for digital economy, formation of normative-legal base, support of innovative activity, training of personnel for digital economy that predetermines the following challenge, namely, changes of functions and operations of the personnel of enterprises. To implement the concept of Industry 4.0 at enterprises requires a new generation of personnel with a new set of skills, competent to perform functions on the development of innovative "smart" products, maintenance of complex computer and engineering systems, control of autonomous systems, etc. There is a tendency in the industry to move away from the demand for physically oriented professions to the demand for mental work. The increased interest in conditions of development of digital economy is shown to the professions of programmer, analyst, coordinator, IT-specialist, copywriter, planner and others. The frame of industry will need to adapt to new tasks in the new working environment, which require analytical and communicative skills, knowledge of production, knowledge of foreign languages, programming skills, application of IT-technologies, flexibility, knowledge of the market of products (Lubanova, Zozula, Shcherba, Oleinikova, 2017). Personnel is one of the main elements of transformation, a key resource of the digital economy, representing a multifunctional complex subject of development, production and commercialization of "smart" products, a source of generation of competitive ideas.

Conclusion



- In general, the introduction of the Industry 4.0 concept and digitalization of the economy will lead to changes in the system of production and sale of products, will cause organizational and structural transformations, the emergence of new business models using new technologies.
- The fundamental features of digital economy include:
 - ✓ high speed and growth;
 - ✓ transformation (transformation) of business processes of enterprises and industries;
 - ✓ reduction of expenses for realization of business processes;
 - ✓ the emergence of new business models;
 - ✓ emergence of new "smart" products, new markets;
 - ✓ changes in the structure of professions in demand;
 - ✓ constant diffusion of innovations;
 - ✓ active development of electronic payment systems.
- Digitalization assumes formation of considerable objective competitive advantages for the enterprises in the future under condition of overcoming of some barriers observed for today that defines necessity of working out of road maps of realization of the concept Industry 4.0, "smart" mechanisms of transformation of existing industrial systems, models and mental maps of construction of digital economy.