

**PROSPECTS FOR THE DEVELOPMENT OF ECONOMY DIGITALIZATION IN  
THE CONDITIONS OF DIGITAL TRANSFORMATION**

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**Annotation** The article is devoted to the study of activities aimed at the digitalization of the economy in the context of digital transformation. Digitalization and digital transformation of socio-economic systems are considered. The article analyzes the concepts of digital transformation, such as platform, cyber-physical system, new industrial revolution "Industry. 4.0".

**Keywords:** digital transformation, digitalization and digital transformation of socio-economic systems, reliability; smart (digital) city; smart (digital) road and smart (digital) transport, cyber security of energy systems, robotization, blockchain, automation - informatization - digitalization, service of economic processes.

**Introduction** Systematization and generalization of the views on the essence and content of digital transformation existing in theory and practice make it possible to form the author's idea and interpretation of such a modern phenomenon as "digital transformation", reveal its essence and determine the role in the development of economic systems [1-6,10,12, 13].

According to the concept presented in 1993 by the mathematician Vernor Vinge at the Vision-21 symposium [5], the main approaches to the digital transformation of socio-economic systems at the present stage of the development of the digital economy can be defined as: 1. **Process** approach, within which it is customary to consider the socio-economic system as a value chain from the development of a product / service to their implementation and maintenance; 2. **Sectoral** approach, which puts forward the need to study the close relationship of socio-economic systems at various levels and sectors of the economy; 3. A **technological** approach to the digital transformation of socio-economic systems involves the choice of a dynamic pool of technologies that contribute to accelerated digitalization and digital transformation of a particular socio-economic system. In the scientific literature, within each approach, the corresponding models of digital transformation are developed and presented. Changes in the quality and content of information do not occur as part of **digitization**, for subsequent processing in digital format, it is simply converted into electronic form, which allows you to improve existing business processes by adding information in digital format to them.

**Digital transformation** is an element of a more global trend in the service economy, as interaction within the digitalized segments of the economy occurs mainly through the exchange of services and the co-production of services by its subjects - digitalization (digitalization) is initially the creation of a new product in digital form. Therefore, the key difference between digitalization (digitalization) is the creation of a new innovative product, with new functionality and consumer properties. And if **digitization** is primarily aimed at improving existing business models and changing business processes, then **digitalization** allows you to get a significant breakthrough in business and new competitive advantages. **Digitalization** is already an element of the 4th industrial revolution (Industry 4.0).

The following are identified as the most progressive modern concepts of digital transformation in [5]: 1. **Platform concept** - a business model that has been formed in the process of digital transformation and is designed to function in the digital economy.

2. The concept of "**Cyber-Physical System**" involves the formation of a single interconnected complex of computing resources and physical processes, both at a separate enterprise and in a complex, engaged in the implementation of successive redistributions in value chains and including: CAD / CAE computer-aided design systems; AR and VR technologies for creating visual "hint

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instructions" in the workplace, as well as for promoting and selling products; 3D printing for prototyping and production of pilot batches at local sites; industrial robots and "computer vision" systems coordinating their interaction; a system for integrating "supplier-client" pairs into a single loop for managing end-to-end business processes and data exchange; big data analysis for online decision support.

3. The concept of a **new industrial revolution "Industry. 4.0"**, in turn, is rapidly gaining technological certainty and transforming into business practices. Philosophy Industry 4.0 (Industry 4.0) was first introduced in Germany in 2011 and symbolizes the initiation of the fourth industrial revolution 4.0. As the basic technologies of the concept "Industry 4.0." defined: robotics, blockchain, modeling and forecasting, big data and advanced analytics, Internet of Things (IoT), cybersecurity, cloud computing and data storage, horizontal and vertical integration, augmented reality, augmented manufacturing, continuous 3D printing. The system projects of digital transformation of socio-economic systems also include: **smart (digital) city; smart (digital) road and smart (digital) transport; smart home and smart products**. The totality of the listed system projects for the digital transformation of socio-economic systems should be presented as a special ecosystem.

4. The latest concept of **digital transformation** of socio-economic systems today is the strategy for the transition to a digital society **called "Society 5.0"**, presented by the Japanese government and scientists, which is designed to solve social problems by integrating physical space, cyberspace and high technology, making life human comfortable and complete, and innovation - safe and environmentally friendly. A similar development within the framework of the concepts of the New Industrial Society of the 2nd generation and Noonomics was carried out by the Russian professor S.D. Bodrunov [5]. According to this concept, primary data must be pre-processed - turned into more or less structured information, from which, preferably by intelligent methods, the required knowledge must be extracted. This knowledge should be used to manage the respective facility.

From this point of view, digitalization can be considered as an evolutionary modern element of the chain **"automation - informatization - digitalization"**. And the experience of successful automation and informatization in the energy industry is huge. **End-to-end technology** is a key scientific, technical/technological solution, the implementation of which provides a breakthrough and game-changing improvement in the industry's position in existing markets for works, products and services or contributes to the formation of new markets.

#### **System projects of digital transformation of socio-economic systems**

1. **Digital factory (factory) (smart factory, virtual factory)**. The "Digital Factory" is closely linked to the concepts of "Industry 4.0" and "Digital Manufacturing" (**digital manufacturing**). Initiatives to create the Factories of the Future are supported, in particular, in the countries of the European Union.

"As part of the Horizon 2020 technological development program, pilot projects of Digital Factories are being created on the basis of such companies as Volkswagen (automotive industry, Germany), Siemens (electronics, Germany), AgustaWestland (helicopter industry, England, Italy), Consulgal (construction, Portugal). Digital factories (Digital Factory) in terms of the overall architecture of the Factories of the Future are the basis (an integral part) of the development of "Smart" (Smart) and Virtual (Virtual) factories.

#### **"End-to-end" and "sectoral" interpretations of digitalization**

One of the key elements of the digital factory is additive manufacturing (layer-by-layer manufacturing), which is based on the manufacture of a product in layers based on a 3D computer model using 3d printing. According to Marcets&Marcets, by 2022 the 3D printing market will be worth more than \$30 billion.

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“According to PWC estimates, in 2015, about 7% of industrial companies used 3D printers for the production of final industrial products, and another 7% of companies needed to implement this technology.” 3D printing is associated with the concept of decentralized (**additive**) manufacturing (**distributed manufacturing**).

**2. Digital city (smart city).** The **Smart City** concept is the concept of integrating information and communication technologies and the Internet of Things to manage city assets (schools, libraries, transport, hospitals, power plants, water and waste management systems, law enforcement and other public services). Arup, a global urban consulting firm, estimates that the global market for smart city services will be \$400 billion a year by 2020. Collaborations are already being created around the world to create smart cities with the participation of the world's largest technology companies (Cisco, GE, Microsoft, Siemens, etc.).

An example of such cooperation is **the Chicago Digital City** project. Construction companies show the greatest interest in the practical application of Smart City. In 2014, the largest Russian developer Morton (PIK Group), together with RVC, launched the Smart City initiative and searched for good practices to apply. The development company **Kortros** also implements construction projects in Yekaterinburg and Perm in **the Smart City format**. The concept of "**Smart City**" can also be represented as a set of industry projects.

**Centralized management of the digital transformation** of socio-economic systems at the state level through a single digital platform based on continuous monitoring of the market and consumers makes it possible to optimize local infrastructure and close the gap between regions. Among the main characteristics that a new digital institution should have, it is worth noting the following features of a single digital platform operating at the state level: centralized accounting of infrastructure facilities in the on-layn mode; management of infrastructure provision of regions, settlements, industries and end users; end-to-end analysis and centralized collection of reports; quick response to changing needs.

**Conclusion** The proposals outlined in this article open up the prospect of further research, which is currently important, the problems of digitalization of the economy in the context of digital transformation and predetermine:

1. Digital technologies used in the world market are quite extensive and reflect global trends for their implementation. Innovators in the field of digital technologies in the global market are large financial institutions, IT companies, industrial companies, retail companies due to the availability of resources not only to adapt digital technologies to their needs and customer needs, but also due to their skills and readiness for organizational change.

2. The motivation of companies making the transition to digital technologies is explained by increasing competition in the markets, the need to provide customers with better digital services, as well as the desire of companies to reduce internal transaction costs.

3. The most preferred and cost-effective form of implementing digital transformation processes for the socio-economic systems of the economies of countries, in our opinion, is the use of the services of service integrator companies that provide digital services integrated into complex and universal digital platforms. The application of this approach to digital transformation is determined by the possibility of ensuring the consistency and complexity of the processes of digitalization and digital transformation.

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