

DIGITAL ECONOMY ECOSYSTEM INSTITUTIONS AS AN ACTOR OF GLOBAL TRANSFORMATIONS

The subsystems of the digital economy ecosystem are characterized by constant internal transformations and are in a state of continuous interaction through a system of institutional and digital connections. We include the following in the digital economy ecosystem institutions: regulatory rules, technological standards, ethical norms, government mandates, i.e. the «rules of the game» that allow digital economy entities to realize their digital ambitions. Digital economy ecosystem institutions are necessary to reduce the negative effects resulting from failures in regulating the business environment in the context of digitalization, imperfections in the communications system and connections between the subsystems of the digital economy ecosystem (*digital gaps, lack of demand for human resources due to automation and robotization, information risks of using digital technologies*).

The ecosystem of digital platforms and communications has three priorities [1–4]: promoting the creation of a favorable environment and framework conditions for electronic interactions between entities of the digital economy ecosystem; promoting the creation of digital products and their promotion; promoting the development of skills in the field of information and communication technologies.

Internal digital platforms of enterprises (product and/or technology platforms) are assets (knowledge, design solutions, technologies, components, etc.) integrated into a single structure, with the help of which an enterprise can effectively develop and produce many derivative products (for example, a family of cars based on a product platform). The development of internal platforms is aimed at obtaining potential benefits in the form of savings in fixed costs, the effects of a modular approach – the ability to produce a large number of derivative products at low costs and flexibly change product attributes depending on the changing needs and tastes of consumers. External digital platforms are products, technologies, technical modules, services that provide a basis for the development of complementary products, technologies and services by

other enterprises. The open interface of digital platforms stimulates innovation among producers of complementary products.

Examples of digital communication technologies include: big data/analytics, mobile technologies, private cloud, public cloud, APIs and embedded technologies. Additional technologies currently in use include application performance monitoring, microservices and containers, software-defined storage and software-defined networks. Artificial intelligence, machine learning and the Internet of Things are the three leading technologies that enterprises are implementing today. Companies implementing digital technologies receive both private benefits from investments and associated advantages – spillover effects – for example, in the form of increased service reliability, increased competitive advantages of the company, a wider range of technologies and opportunities for their flexible application. Spillover effects are manifestations of any economic activity that affects the activities of third parties not directly involved in the interaction process.

From the standpoint of «knowledge spillover», the concentration of firms in one industry helps knowledge flow between firms. From the standpoint of «Jacobs Spillovers», the concentration of different industries in one place stimulates innovation. Thus, in the context of the digital economy, «spillover effects» are most often encountered in the theory of innovation management, when assessing the intra-industry impact of foreign companies' investments and identifying positive effects, analyzing the R&D sphere, as well as in the process of assessing the dissemination of knowledge. The associated results of digital technology implementation often exceed the direct ones, however, at present they are poorly identified and practically not assessed. In addition, the spillover effects of the digital economy are far from always positive.

Among the economic and social benefits that the economic system and society receive from the implementation of digital technologies, we note the benefits of increased labor productivity as a result of the introduction of more efficient business processes supported by ICT, optimization of the supply chain, and a reduction in overall costs. Among the negative consequences of digitalization, scientists [5–7] note a reduction in the workforce of medium and low qualifications as a result of a particularly strong substitution of capital, as well as a slowdown in labor productivity. At the same time, the authors do not distinguish between the main and secondary effects of digitalization. When managing innovations, horizontal spillover effects arise (innovations are copied by other companies, which leads to increased productivity), vertical (increased productivity in the

delivery of goods and services along the supply chain) and internal (through learning by doing).

From the standpoint of the resource-based approach, the digital economy is based on the following resources and factors: (1) generated human knowledge and skills; (2) digital infrastructure resources in the form of Internet access and information use capabilities; (3) scientific research and development as the basis for technological innovation; (4) digital technologies based on artificial intelligence, robotics, AR/VR and blockchain. From this standpoint, the development of the digital economy requires significant investments made by all subjects of the national economy. At the same time, the education sector is the basis for the formation of the entire digital economy. The availability of education for all categories of the population, as well as the level of professional competencies, is largely determined by the standard of living of the population in a particular country, their income level, as well as support from the state. The formation of digital infrastructure is the starting point for the development of the digital economy.

In terms of regions of the world and countries, the introduction of new technologies is uneven, but enterprises in emerging markets, following countries with mature economies, have moved to the introduction of new technologies that provide a quick return on investment for target cases of industrial use. Almost every country focused on achieving digital development goals has adopted a national strategy in the field of informatization, reflecting specific steps to expand digital infrastructure, improve the level of education and competencies of specialists to service the digital sphere, strengthen the scientific development and innovation industry, and ensure cybersecurity.

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