

# Digital economy in developing countries: problems and prospects

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**Abstract** — The purpose of this study is to develop the principles for building a digital economy in developing countries. It is shown that the priority task of the socio-economic development of these countries is the creation of a digital economy. The features of the development of the digital economy are highlighted, which include the presence of intellectual assets, the increasing importance of data, the network organization of business, the widespread adoption of the Internet and the global nature of data exchange. The tools for solving the problems of the digital society are defined, which include digital platforms for the development of a “share economy”, as well as cloud technologies and methods for processing large databases. The principles of building skills development systems in terms of digitalization are formulated, among which are rational use of resources, combining short-term and long-term development goals, lifelong learning, systematic approach, a unified approach to management at different levels of government and involvement of all stakeholders in the digitalization process.

**Keywords** — digital economy, principles of digitalization, shared economy, developing countries

## I. INTRODUCTION

The modern world is undergoing a digital revolution with significant implications for the economic and social fabric. As in the case of previous waves of technological innovation, digital technologies create conditions for the transformation of socio-economic relations. The development of the Internet of Things (IoT) can make workplaces and transportation systems safer, cities more livable. Broadband networks and online applications are used for communication, shopping, travel and work, as well as to create completely new business models and markets. Digitalization has turned many consumers into prosumers through the production of content on digital platforms and participation in P2P networks.

The digital economy boosts productivity and supports socio-economic development. The introduction and use of digital technologies in economic processes increases productivity and allows you to participate in global value chains. Digitalization contributes to increased efficiency by reducing transaction costs, eliminating information asymmetry, using economies of scale and network effects. Due to these factors, the digital economy has expanded access to a significant number of markets and services — education, health, credit, crowdsourcing, and crowdfunding.

Taking advantage of the global digital ecosystem is important for both developed and developing countries. Many countries with developed economies already have a developed digital ecosystem and widely use the benefits of digitization in

the socio-economic sphere. However, as world experience shows, the development of the digital economy can contribute to social and economic transformation, regardless of the stage of a country's development. With proper organization, countries at any stage of development can use digital technologies to accelerate the provision of high-quality medical, educational and government services.

At the same time, the growth of the digital economy is not without its problems. Digitalization creates new jobs, while reducing old ones, causing significant changes in the labor market. This contributes to the changes that are the main cause of growing income inequality. Such changes in the labor market are worrying, because digitalization can lead to increased unemployment and exacerbate existing differences in income distribution. The characteristics inherent in the success of the digital economy — decentralization, network effects, and the speed of technology diffusion — also create new challenges for states.

The digital economy, characterized by the cross-border production and consumption of digital goods and services, challenges the state policy in the field of taxation and trade, which is traditionally based on geographical principle. The growth of the sharing economy and digital platforms, such as Uber and Airbnb, challenges national tax systems, health insurance systems, and education and training. Transnational data flows passing through individual countries raise problems related to their protection. The growing dependence of state structures and enterprises on digital systems also makes them more vulnerable to attacks in cyberspace.

Digitalization creates special problems for developing countries. Maximizing the benefits of the digital economy depends on a basic level of digital infrastructure, which is quite low in many emerging economies. In addition, there is a certain technological dependence of developing countries. At the same time, developing countries have a chance to derive maximum benefit from digitalization, since they do not need to spend enormous resources on the development of innovative digital solutions. Developing countries should be involved in strategic planning in order to maximize the development impact of digitalization. Countries that do not risk lagging behind in their competitiveness. *On this basis, the purpose of this study is to develop the principles for building a digital economy in developing countries.*

## II. RESEARCH METHODOLOGY

Determining what the digital economy is problematic, as digital technologies are increasingly penetrating many areas of society and the economy. Based on

the previous concepts of the “information economy” [1] and the “network economy” [2], the concept of the digital economy is rooted in digital technologies, information networks and actions that people carry out in such networks. The digital economy is a combination of several basic technologies and a number of economic and social models implemented through the Internet and related technologies.

It covers the physical infrastructure on which digital technologies are based (broadband lines, routers), the devices that are used to access (computers, smartphones), the applications they use (Google, Facebook) and the functions they provide (IoT, data analytics, cloud computing, calculations). The digital economy has penetrated many aspects of modern life, including retail, transport, education, and agriculture.

The digital economy provides greater convenience for consumers in a number of areas. Now consumers can buy and sell used goods via eBay, plan trips with TripAdvisor, call a taxi with Uber, rent a room with Airbnb, or find a job with LinkedIn. Almost all areas of human activity were transformed using digital technology. The digital economy is changing the way we do business and provides new opportunities for participants. Digital technologies provide greater convenience for consumers, as well as greater flexibility for businesses, for example, through cloud computing and data analysis:

- Cloud computing already provides significant business benefits, although there are significant opportunities for expansion in this area. Cloud computing is a computing services model based on a set of computing resources that can be accessed in a flexible way. If before companies could run software and applications on their own computers and servers, now cloud service providers allow enterprises to access various applications online. Cloud computing offers firms a number of advantages, such as: flexibility, simple scaling according to business needs; disaster recovery by backing up data on multiple servers to prevent redundancy; mobility, allowing employees to work from anywhere in the world with access to the Internet; financing, moving from capital to operating expenses models frees up resources and makes spending more predictable; Focus on outsourcing key IT-requirements to dedicated cloud service providers, enabling companies to focus on their core competencies and increase efficiency.

- Companies use data analytics to identify trends in consumer behavior and make more informed business decisions. The constant decline in the cost of computing power of computers and the emergence of advanced analysis methods, such as text analysis, machine learning, data analysis and forecasting, have led to the emergence of data analytics. Using data and analytics to improve or promote new products, processes, organizational methods and markets - “data-based innovation” (DDI) is a new source of growth.

Firms, consumers and government structures in developing countries can benefit from new business models based on a shared economy. The exchange of goods and services is one of the earliest forms of human interaction. In most cases, such interactions were limited within the family or the immediate environment. The rapid development of digital technology now allows access to a much wider network of agents, which expands the possibilities for mutually beneficial transactions. As a result, the sharing economy has changed the way people travel, make purchases and gain access to resources. Although the potential of a shared economy in developing countries is

diverse, the problems and negative consequences it creates are also complex and diverse [3].

Equity economies can benefit developing countries in many ways. First, the shared economy models allow the use of assets that are expensive for users. Flexible working conditions allow workers in the informal sector to gain experience and the path to their formalization. Equity economies encourage the efficient use of free resources, which puts less pressure on the environment and helps developing countries take the path of sustainable development.

However, a shared economy creates problems for regulation, competition and taxation that need to be addressed. Some regulatory reform is needed so that the rules developed for traditional business models do not interfere with the development of a shared economy, as well as solve consumer safety problems. Another problem is related to the desire of digital platforms to increase the scale of their activities, which leads to a violation of the principles of competition. Therefore, antitrust authorities should regulate the market for digital platforms. Another problem is related to the taxation of participants in the share economy, since tax laws do not keep pace with many new business models related to the share economy. Developing countries should work with resource sharing platforms and other stakeholders to develop appropriate regulations to formalize a shared economy, provide solutions to public problems, and collect taxes. Thus, a shared economy can contribute to economic development, environmental sustainability and social cohesion [4].

The digital economy is of considerable value to developed and developing countries, but it causes a number of problems. Digital technologies can stimulate development in a number of areas: by reducing production costs and using returns to scale; by improving the efficiency of existing markets, increasing the size of markets and creating new markets; creating economic opportunities in other sectors; and by improving quality beyond the overall performance of the factors of production. However, the pace of technological change is accelerating, and technological change often outstrips existing legislation. The key task in such conditions is the development of models for the digitization of socio-economic systems [5]. Failure to actively exploit the digital revolution will have detrimental consequences for a number of socio-economic aspects, including the prospects for economic growth of countries, regional competitiveness, inclusion in global production chains with high value added and the recruitment of highly skilled labor. A major challenge for developing countries is creating a basic level of digital infrastructure, on the basis of which the rest of the digital economy is built. This is not only a question of the correct amount of public and private funding, but also technical and institutional change.

### III. RESULTS OF THE RESEARCH

The existing changes in the socio-economic relations, the transition to the post-industrial structure are accompanied by a whole set of features characteristic of the digital economy and manifested in the following points [6]:

1. The most important condition for development is the availability of intellectual assets that are used to increase economic efficiency. Currently, the most attractive for investors are companies with a significant amount of intellectual resources. Prominent examples here are representatives of the Internet economy, such as Facebook, Uber, Airbnb, who, in fact, without physical assets, are digital

platforms and overtake many industrial giants in their capitalization.

2. Increasing the importance of data in economic activity. A significant part of economic activity is related to services related to intellectual property, databases, software products. One of the trends in data management that deserves special attention is cloud technology. Such technologies are a model that provides access to the necessary data management services in a flexible, scalable way. As cloud technologies translate computing into a service, companies do not need to make major investments in the purchase of computing power. Cloud technologies provide opportunities for the use of software, computing power, data storage. An important factor when using cloud technologies is the desire to save on services. Enterprises using cloud technologies in their operations reduce the costs of creating and maintaining their own digital infrastructure. At the same time, the economic efficiency of using cloud technologies depends on the level of development of the enterprise's digital infrastructure. For enterprises with a developed infrastructure, cloud technologies are a way to increase the speed of service provision and make services more flexible. The main advantages of using cloud technologies are their high performance and availability, flexible scalability and fast deployment. However, the use of cloud technologies is accompanied by certain problems and difficulties. The main problem is data security. The use of digital technology contributes to increased productivity. However, their active implementation by enterprises is constrained by insufficient awareness of potential benefits, as well as investment and implementation costs. An important role in promoting the use of digital technologies can be played by government agencies by encouraging enterprises to use modern digital technologies to improve their performance.

3. The main organizational structure is the network, not the hierarchy. Hybrid forms of organization are more adapted to rapid changes in the market, which affects their efficiency. Many large organizations with a rigid hierarchical structure adapt to new realities, reducing the number of hierarchy levels, blurring the boundaries of departments and giving non-core activities to outsourcing. Countries with a developing economy, including Russia, are in the process of transition to a new type of business, deciding whether to increase their competitiveness. One of the methods to overcome the backlog of leading economic countries is the active use of new network forms of interaction between economic entities. Creating favorable conditions for the functioning of network structures is an important principle for the development of a modern economy. The competitiveness of modern economies is based on the network interaction of enterprises and organizations that produce, distribute and use common resources. Its interactive nature suggests that innovative ideas are generated at all stages of the production cycle. There are numerous horizontal connections, specialists of various professions and qualifications are involved in the innovation process. It can be argued that the era of relatively isolated and closed industries is a thing of the past. Relationships with suppliers, consumers, and even competitors are becoming increasingly important, not to mention research institutions. Therefore, industrial policy should not focus on individual enterprises and sectors, but rather promote the development of network structures.

4. The main tool for finding information and communication is the Internet. The development of broadband Internet, mobile Internet, Internet applications and gadgets has radically changed the way people communicate in society.

Using websites, digital platforms, instant messengers is much more efficient than using previously recognized means of communication.

5. Data sharing is global. Economic agents who do not have access to the global data transmission network, markets and technologies of other countries, trying to operate only in limited local markets, as a result, become limited by a narrow framework and are inferior in the global struggle.

6. The main approach to management is self-organization. An economy based on decentralization and globalization is an excellent basis for the formation of network structures on a bottom-up basis, and the transition of bureaucratic structures to more flexible and efficient forms. Other important examples of self-organization processes include crowdsourcing, crowdfunding, and a "shared" economy.

#### IV. DISCUSSION OF RESULTS

The fundamental response to the designated challenges of the digital society are changes in the structure and approaches to the management of economic systems of different levels [7]. To the forefront of such changes come horizontal commands aimed at obtaining results. This requires a transition from closed, overly bureaucratic structures to open organizations that form a network [8]. Such organizations are hybrid forms of economic activity with flexible connections, which are established and revised as necessary.

The most important issues in such network structures are the issues of real-time resource management and coordination of the activities of network participants. As part of the development of a "shared" economy, this approach is implemented through digital platforms, with the help of which participants can be coordinated with the goal of more efficient use of resources (for example, sharing of housing, cars, etc.). Such tools allow more efficient use of resources, increasing their availability, reducing the burden on the environment [9]. Within the framework of modern enterprises, such problems are solved using the tools of the digital economy, such as cloud technologies, ERP-systems and a number of other tools.

With the development of network structures in the economy, the transformation of the industrial economy, the creation of a flexible network of new structures and new forms of production and economic activity organizations will become noticeable. The economic advantages of network forms are their ability to quickly adapt to changing conditions. Due to the fact that the boundaries of network forms of organization are usually more easily managed than the boundaries of hierarchies, modifications of the composition of network organizations as a response to these changes are easier. The results of this development will be an increase in the number of small-scale production, individual fulfillment of production orders. The changes will affect other aspects of the economy, in particular the labor market. Already, the main requirements of the employer to the employee are: ability to work in a team, work in a multitasking mode, a creative approach to solving problems, a high degree of adaptation in rapidly changing conditions, which is typical of network organizations. In general, the intellectualization of labor and capital, the increase in the information capacity of the modern economy [10].

The formation of a network structure based on a highly developed information management infrastructure and the effective use of intellectual resources implies a significant change in the entire socio-economic system of society and the

state. Network technologies are central to the renewal of key spheres of social activity: state and municipal government, business, education, health, culture, security, public life [11]. The network component of economic relations ensures the effectiveness of the activities of individual economic agents, reduces transaction costs and organizes mobile work organization. It can be said that without solving the problems of their effective large-scale use, without developing the network infrastructure, today it is impossible to successfully solve any of the priority tasks of socio-economic development.

An important change in the approach to management in modern conditions is a fundamentally different attitude to a person and his role in decision-making. With the development of the digital economy, the place and the role of a person in the conditions of a new type of business are changing in the most significant way. The analysis of such changes includes the study of a whole complex of interrelated issues: changing labor requirements, transformation of the education and training system, new approaches to the management system. The level of knowledge, competencies and skills of the population in the field of digital technologies are an important factor in the spread and development of these trends in various spheres of public life [12]. To analyze this factor of socio-economic development, the category of "human capital" is used. In the classical interpretation, human capital is understood as a set of knowledge, skills and abilities that a person possesses and uses in the process of labor and that affect his economic productivity. In the conditions of the formation of the digital economy, the interpretation of this concept is expanding, with a more significant role in human capital given to skills in the field of digital technologies. Improving the quality of human capital, the involvement of an increasing number of people in educational processes, the development of skills and competencies in the field of digital technologies are the basis for the formation of the digital economy and the effective use of digital technologies in different areas of activity.

Changes in the demand for skills represent two serious problems for the education system and advanced training. Firstly, despite the recognition that the demand for skills in the future will be very different from today, it is difficult to identify and predict because of rapid technological change. The second problem is to adapt the skills development system to new conditions after the demand for skills has changed.

The dominant role of highly skilled creative work becomes the determining factor for the development of a new type of society and its inherent economy. Economic efficiency in modern conditions is determined not so much by quantitative indicators of the number of personnel as by the presence of specialists capable of creating a new product or offering a new service, finding a new way of organizing production, adequately responding to changing market conditions. New forms of human activity appear, human capital is dynamically formed, which is expressed in constantly updated knowledge and skills. The principles for building systems for developing skills in the conditions of digitalization include:

- *Rational use of resources.* In view of the limited resources, investments in the creation of a skills development system should provide the greatest economic and social benefits;
- *Combining short-term and long-term development goals.* An effective skill development system is needed to solve structural and cyclical tasks (such as rising unemployment when the economy shrinks, or a shortage of qualified

personnel in an economic recovery), as well as to ensure long-term strategic planning in order to achieve competitive advantage and support structural change;

- *Lifelong learning.* Studying skills as a tool that needs to be honed throughout a person's life, a strategic approach allows assessing the impact of various types of education - from early childhood to informal learning in order to balance the allocation of resources to maximize economic and social benefits;
- *Consistency.* Coordination of goals in such interrelated areas as education, science, technology and innovation, industry, employment, economic development, migration and finance contributes to the identification of compromises, avoiding duplication of functions;
- *Alignment of different management levels.* Consideration of skills issues at the local level, alignment of national goals with local needs;
- *Involvement of all stakeholders.* Coordination of various levels of government and a wide range of stakeholders, including employers, professional and industrial associations and chambers of commerce, trade unions, educational institutions.

Continuing education and advanced training is becoming a prerequisite for the development of a modern economy. Currently, there is a tendency to increase the average period of education. This is facilitated by the fact that continuous professional development is the key to social success and stable income. Therefore, special attention should be paid to training in the field of information technology, as well as specialists of new information professions. This will increase the human capital of both individuals and teams, and hence the society as a whole.

## V. CONCLUSIONS

Thus, as a result of the study, with the aim of developing the principles of building a digital economy in developing countries, the following theoretical results were obtained.

Firstly, it is shown that the priority task of socio-economic development for most developing countries is the transition to a digital economy, the introduction of digital technologies and the creation of effective business models that meet the challenges of our time.

Secondly, the features of the development of the digital economy are highlighted, which include the presence of intellectual assets, an increase in the importance of data, a network management organization, the widespread introduction of the Internet, and the global nature of data exchange.

Thirdly, the tools for developing the digital economy in developing countries are identified, which include digital platforms for

development of the "share economy", as well as "cloud" technologies and methods for processing large databases.

Fourthly, the principles of building systems for developing skills in the conditions of digitalization are formulated, which make it possible to increase the efficiency of the digital economy in developing countries.

The development of digital economy in developing countries will improve the quality of life of the population of these countries, improve the socio-economic and environmental sustainability of states.

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