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Conceptual Approach to the Development of Financial Technologies in the Context of Digitalization of Economic Processes

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Abstract:

The successful introduction of the digital economy into the information space of the Russian Federation involves the solution of several problems associated with the transition to a new paradigm of economic development based on the digitization of social and economic processes.

At the same time, the existing regulatory mechanisms and legislation do not create optimal conditions for the development of the market of new financial instruments and technologies in Russia today. There are socio-economic risks, the key ones including an increase in the outflow of capital and innovative projects to other countries, a lack of confidence on the part of potential investors in new financial instruments, a decrease in the stability of traditional financial institutions.

On this basis, the following tasks have been set in this article. To consider the terminology in the field of digital economy from the theoretical aspect; to identify trends and justify the need for digitalization of economic processes based on the use of new financial technologies; to reveal the informative characteristics of financial technologies promising for Russia.

This article ends with a conclusion that the development of the digital economy in Russia is due to the need to ensure the information and economic security of the state, realize the potential of the new economy to improve the standard of living and national well-being through the introduction of innovative communication and financial technologies. The impact of the "digital economy" on socio-economic processes is multifaceted. It is sustainable and permeates all spheres of life, being an integral part of modern society.

Keywords: *Digital economy, financial technologies, blockchain, bitcoin.*

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1. Introduction

The launch of a large-scale system program for the development of the economy of a new technological generation − the digital economy in Russia − fully correlates with global trends and is aimed at qualitative transformational changes in science and technology, financial technologies, artificial intelligence, and the creation of large data processing systems. Big data is a technology for the accumulation, processing and storage of large amounts of heterogeneous information. They are the basis for the development of machine learning algorithms and artificial intelligence, solving analytical problems and optimizing business processes. As this technology develops, the economic interrelations of people, the nature of the products and services sold, the channels of interaction between customers and suppliers are subject to significant transformations (IDE, 2018).

The formation of a new technological basis for the social and economic sphere becomes an objective necessity in the context of new requirements for communications, computing power, information system and services in the digital economy era (Grima and Sammut, 2017). The possession of digital competences enables citizens of the Russian Federation to come closer to the information environment in everyday life and use the potential of data in the digital form (Vovchenko *et al.*, 2017).

The transition of the state to digitalization is a key priority, an issue of ensuring national security. “Digital economy” is the basis for creating qualitatively new business models, increasing their efficiency by eliminating intermediaries. Digitalization of socio-economic processes changes the format of the health care system, education, and public administration, and it can significantly increase the efficiency of various types of production, technology, equipment, storage, and the sale of goods and services (Bojare and Romanova, 2017). It is obvious that one of the main advantages of the digital economy is the elimination of various groups of intermediaries in the implementation of transactions, as well as the formation of the information space, considering the needs of the population and society in obtaining reliable and high-quality information (Thalassinos *et al.*, 2015). New technologies make it possible to achieve significant growth in economic indicators, transfer all services in the online format, increase the efficiency of the tax system and budget expenditures (Maandi, 2017).

The assessment of Russia’s readiness for the digital economy is based on a study of recent data from leading global ratings. One of the indicators that vividly indicate the degree of spread of the digital economy in society is the share of the digital economy in the country’s GDP. Statistics shows that the leader in this indicator is the United Kingdom − 8.3% of GDP in 2010 and 12.4% in 2016. In Russia, the share of the digital economy in GDP was 2.8% in 2016 (Kolodnyaya, 2018). According to expert estimates, Russia is still lagging the leading countries (China,

Germany, USA, Japan, UK) in the development of the digital economy. This is due to several reasons:

- ✓ gaps in the regulatory framework of the digital economy;
- ✓ unfavorable environment for business and innovation;
- ✓ low level of application of digital technologies by business structures in comparison with government structures;
- ✓ the underdevelopment of public and private institutions and the financial market, which leads to low competitiveness in the global digital market;
- ✓ a significant gap in the level of technological development in various sectors of the economy (digital inequality);
- ✓ insufficient information security of the state, business and citizens;
- ✓ redundancy of statistical reporting between enterprises, citizens and the state;
- ✓ deficiencies in the system of training in the field of digital economy.

2. Theoretical, Informational and Empirical and Methodological Grounds of the Research

From the theoretical viewpoint, common terminology in the digital economy has not been developed yet. The concept of the digital economy has been used in the scientific circulation (especially in western publications) since the 90s of the 20th century. Despite this fact the terms characterizing the economy of a new technological generation are still differently used. There are terms: “creative economy”, “e-economy”, “API economy”, etc. Russia has the task of creating its own digital platforms that are compatible with the global information space.

In a broad sense, the digital economy is seen as “digitalized government”. In a narrow sense, the digital economy is characterized as part of the economy, including the development and production of information and computer technology (ICT), and specifically: the replication of computer equipment, mobile communications, the Internet, and other means of communication. Users of ICT are banks, trading companies, insurance companies, industrial, agricultural and other production companies (Albekov *et al.*, 2017).

The World Bank defines the digital economy as a system of diverse economic relations contracting long chains of intermediaries using the Internet, ICT, which accelerate connections between companies, banks, government and the public. In Russia, the digital economy development program is associated with the strengthening of national security and ensuring the technological independence of the country.

The Russian legislator has formed the concept of “digital economy” as an economic activity in which the key factor in production is digital data. Meanwhile, its processing and using the results of analyzing them in comparison with traditional

forms of management can significantly improve the efficiency of various types of production, technology, equipment, storage, sales, delivery of goods and services.

Theoretical substantiation of the need for digitalization of economic processes in Russia is associated with the formation of a new paradigm of economic development (Savina, 2018). The objective of the paradigm is to increase the involvement of citizens and economic entities in the digital space, form sustainable digital ecosystems and create infrastructure that ensures the interaction of actors in the digital space. This will be facilitated by the implementation of the concept of e-government, informatization of transport, housing and public utilities and other infrastructure facilities in the framework of the idea of a "digital city", "smart ecological house (eco-house)", creation of professional networks, development of financial technologies, including a wide range of innovations: artificial intelligence, cloud computing, blockchain (Chibrikov, 2018).

From a methodological point of view, relying on general scientific methods of knowledge such as a dialectical method, structural and functional analysis, specific methods of assessing the digitalization of the economy should be distinguished. They include several indices used in international rankings of the digital economy (Indicators of the digital economy, 2018).

The International Digital Economy and Society Index (I-DESI) aims at measuring the progress of countries in the development of the digital economy and society. Global Cybersecurity Index characterizes the level of cybersecurity in the country. It is calculated based on data on the development of legal, technical and organizational measures in the field of cybersecurity, the availability of public educational and scientific institutions, partnerships, cooperation mechanisms and information exchange systems. The Global Competitiveness Index of the World Economic Forum is calculated based on 12 parameters (quality of institutions, infrastructure, macroeconomic stability, health and primary education, higher education and vocational training, efficiency of the goods and services market, efficiency of the labor market, development of the financial market, technological level, size of the domestic market, competitiveness of companies, innovative potential.

Global Innovation Index includes 81 indicators reflecting the key factors of countries' innovative development. The ICT Development Index is used to assess the scale of the digital lag between developed and developing countries. The Social Progress Index is a cumulative assessment of social and environmental indicators reflecting the basic needs of an individual, the basis of individual's well-being and development opportunities. The E-government Development Index demonstrates the degree of readiness of countries to implement and use e-government services. Indicators of this index for 2010-2016 are given in Table 1.

Based on the data of the E-Government Development Index (EGDI), it is possible to argue about the intention of government agencies to introduce information

technologies into action. This index is compiled every two years by the UN Department of Economic and Social Affairs. The study contains data on the level of development of e-government in various countries, as well as a systematic assessment of trends in the use of ICT by government institutions.

Table 1. *Indicator of E-Government Development Index for the Russian Federation for 2010-2016.*

Year	Position of the RF in the ranking (points) by E-Government Development Index
2010	59 position (0,5136)
2012	27 position (0,7345)
2014	27 position (0,7296)
2016	35 position (0,7131)

The opportunities resulting from digital government technologies for the Russian Federation are presented in the analytical report "Digital Government 2020: Prospects for Russia", prepared by the World Bank in conjunction with the Institute of the Information Society. According to published data, modern e-government infrastructure requires modernization, which consists of several aspects.

The viability and relevance of digital development is also reflected in the main directions of the implementation of the Digital Agenda of the EAEC member states until 2025, where digital transformation acts as a key factor for development (EAEC, 2018). The concept of the digital economy continues to evolve due to the growth of the transformative capabilities of digital technologies. It goes beyond e-commerce and includes doing business, maintaining communications and providing services in all sectors, including transport, financial services, manufacturing, education, health, agriculture, retail, media and the entertainment industry. As a result of digital transformation, a new technological mode is born, new sectors of the economy are emerging (Table 2).

Table 2. *Digital space of the EAEC until 2025 (EAEC, 2018)*

Digital space element	A component of the element
Digital infrastructure	Electronic identification services;
	Information security;
	Cloud infrastructure and initiatives.
Digital solutions	E-customs;
	E-commerce;
	E-logistics;
	Digital finance / FinTech;
	Digital integration platform of the EAEC.

Digital solutions simplify the procedures for trade and administration of cross-border services and ensure the free movement of goods, services and human resources.

Providing opportunities for citizens, entrepreneurs, and companies to prosper in the context of digital economy will depend on the success of the EAEC in creating a credible, world-class digital infrastructure, effective integration mechanisms and a regulatory framework supporting digitalization of economic activity. It will also depend on encouraging innovation and attracting stable investments.

3. Results

The conceptual approach to the development of the digital economy in Russia is implemented in the context of the strategic objectives that can be found in a number of government documents.

The program "Digital Economy in the Russian Federation" (Program "Digital Economy of the Russian Federation", 2017) envisages the priority development of the following key areas, which will become the drivers of development: regulation of the digitalization process; personnel and education; the formation of research competences and a technological basis, information infrastructure and security. Each of the directions is filled with relevant content and necessary justification.

The key task in Russian conditions is the digitalization of public administration, which implies the introduction of new technologies in the work of ministries and departments. The improvement of quality management should be based primarily on reducing the number of functions performed by the state based on digital technologies application. Creating a public finance management service model aims to increase flexibility in managing financial resources. Digitalization of public administration should include: tactical management (rulemaking, control and supervisory activities, the provision of public services); strategic (goal setting and planning); personnel management and internal efficiency of government (Voskanyan, 2018).

In Russia, the so-called "competence centers" for the implementation of the main directions of digital economy development have been defined at the state level: Sberbank, Rostec and Rosatom, Rostelecom, non-profit organizations Skolkovo Foundation and the Agency for Strategic Initiatives, as well as heads of working groups − representatives of large business (MTS, Megafon, 1C, Info Watch, Russian Venture Company).

At the contemporary stage, the key task is to ensure the competitive advantage of the Russian Federation in the world arena in the field of financial technologies. To implement this goal successfully, it is necessary to ensure the development of several promising FinTech segments. Speaking of financial technologies, it is worth noting that this is a functional and attractive superstructure over classical financial services, consisting in the introduction of digital technologies.

The ecosystem of financial technologies is a structure that ensures the interaction of subjects in the field of financial technologies for the creation and distribution of innovative products and services in various areas of the economy. For the successful development of FinTech ecosystems in the Russian Federation, EY specialists reviewed a number of initiatives, the successful implementation of which will ensure the competitive advantage of the Russian Federation in the world arena (Table 3).

Table 3. *Initiatives to support the Russian FinTech ecosystems (EY Research, 2017)*

Level of priority	**Technologies**
High level	Blockchain
	Big data
	Open API
Medium level	Artificial intelligence
	Cloud computing

The potential of several digital projects is being considered in the Russian Federation. These projects can help eliminate bureaucratization. One of such projects preparing for the widespread use can be considered the "BIG DATA" technology (big data). The structure will collect data from all operators − from government agencies and legal entities and individuals.

The data required for regulatory compliance supervision is not only increasing, but also becoming more complex. Big data technology eliminates two major disadvantages of outdated technologies: lack of flexibility and elasticity, and the ability to expand the network (Barberis, 2017). Blockchain technology also deserves careful attention. This is a fundamentally new paradigm that allows organizing activities with less effort, but more efficiently and on a larger scale (Swan, 2017).

A revolution is initiated by new generation technologies of FinTech. They are mainly cloud computing (allows performing calculations or storing information on third-party services); blockchain; robotization; biometrics and artificial intelligence. The blockchain allows distributed software to work (for example, cryptocurrency works according to its technology) (Surinov, 2018; Ovcharuk, 2018; Abromovskikh, 2018). Blockchain is a chain of blocks containing information formed according to certain rules. In 2009, the first cryptocurrency Bitcoin was released on the basis of the cryptocurrency. The decentralized blockchain technology significantly reduces the costs associated with the verification of transactions and the creation of a distributed network. In the economic literature, the blockchain is considered as a fundamental factor for long-term economic growth, a factor of large-scale transformation of the financial sector, and the development of new forms of attracting capital.

Researches of various analytical agencies show considerable prospects for blockchain in the global market. According to experts‘ forecasts presented in the WEF 2015 overview report, the blockchain ecosystem will have stored 10% of world GDP ($ 101 trillion) by 2025. Having a revolutionary potential equal to the potential of the Internet, blockchain technology will be introduced rapidly due to the widespread availability of the Internet and mobile communications. According to Gartner, the “Internet of things” space will have comprised about 26 billion devices, and the turnover of the Internet economy will have reached $ 1.9 trillion by 2020.

The ecosystem of financial technologies allows creating an environment of high-tech digital public administration platform in the shortest possible time. It helps minimize the human factor, as well as reduce possible errors, automates the collection of statistical, tax and other reporting and will ensure decision-making based on an analysis of the real situation.

Blockchain technologies significantly reducing the costs associated with the functioning of financial intermediaries and markets and being a decentralized system of interaction between economic agents, can ensure the elimination of excess costs. As a rule, the costs are associated with many financial transactions. Blockchain technologies can create prerequisites for more intense competition among existing financial institutions, but it is also necessary to create an adequate risk management system in the field of digital financial innovations.

4. Conclusions and recommendations

The opportunities of the digital analytical platform are aimed at minimizing the reporting burden on respondents. Tools for disseminating statistical information should be flexible and convenient for all categories of users and based on the following principles:

- ✓ the one-time presentation of data to all authorities;
- ✓ the formation and use of analytical indicators in accordance with changing information needs;
- ✓ the use of an electronic form only in the provision of regulatory and reference information;
- ✓ integration of accounting, statistical and tax reporting.

The elimination of information duplication should be carried out by optimizing the interdepartmental information interaction and reducing the burden on economic entities.

Digitalization of various processes, implying a revolution in management and based on new data processing technologies, contributes to the transition to total decentralization of financial technologies.

The distrust of the traditional financial system in the context of the 2008 global financial crisis and the development of technology have created a demand for new financial solutions and the emergence of a new type of currency (CAD, 2018).

New financial instruments are generally recognized to have a number of advantages, such as: the ability to attract funds from a wide range of people, including non-professional investors, low transaction costs, high settlement rates, and a simplified legal form for attracting investment resources. Despite the rapid growth of new financial technologies, it is premature to talk about replacing traditional institutions with new financial instruments. To develop the domestic market of new financial technologies, it is necessary to solve the following tasks:

- ✓ to develop the foundations of the regulatory framework for the functioning of FinTech technologies, removing legal barriers to the development of the market for new financial instruments, including the harmonization of legal and regulatory framework with other countries;
- ✓ to create a comfortable regulatory environment for the integration of new financial instruments into the activities of existing development institutions;
- ✓ to take measures to form optimal means of control over cross-border payments, money laundering and using it to finance terrorism, tax evasion;
- ✓ to develop a set of measures to introduce new technologies in the work of ministries and departments to improve the quality of management, openness and the level of trust between citizens and the state by transferring all services online, increasing the efficiency of the tax system and budget expenditures.

The decentralized basis for the functioning of new financial technologies in the framework of the key directions of the "digital economy" development will contribute to the emergence of new horizontal links in the innovation ecosystem, which will ensure a technological revolution unfolding in Russia and around the world, a new impetus for development.

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