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Key Components of the Financial Infrastructure of the Digital Economy Within the Fuel and Energy Complex

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Abstract

The purpose of this paper is to provide an outline of key components of the financial infrastructure of the digital economy within the fuel and energy complex. It is established that the formation of global financial architecture, including in the context of development of elements of the digital economy within the fuel and energy complex, is currently accompanied by a sharp acceleration in global cash flows and considerable growth in the international market for electronic money and electronic currencies. The authors prove that, owing to the informatization of the fuel and energy sector and the emergence of new financial technologies, many investors today will find it easier to access international markets. It is also suggested that currently there is a positive trend in the pace of growth in digital services for financial infrastructure, which are attracting significant volumes of investment, with the trend projected to intensify in the near future. In the authors' view, the key factors that will govern the effectiveness of components of the financial infrastructure of the digital economy within the fuel and energy complex are innovations, transparency, and accessibility.

Keywords: *Finances, Infrastructure, Digital Economy, Fuel and Energy Complex, Effectiveness, Enterprise, Market.*

1. Introduction

The digital economy is a relatively new concept with many little-studied aspects, particularly in terms of building its financial infrastructure. At the same time, most developed countries, including the US, Canada, Japan, and Germany regard the development of the digital economy in their society as a strategic objective for the next few decades, laying a particular emphasis on its financial component. This adds relevance to identifying the key components of the financial infrastructure of the digital economy in the Russian Federation.

At the same time, the issue of development of elements of the financial infrastructure of the digital economy is especially relevant in the context of exacerbating recessionary trends within the global financial system. Issues related to the financial infrastructure of the digital economy have been investigated by scholars B. I. Volostnov [1], Yu. Yu. Dashchenko [2], Yu. S. Kolodei [3], E. D. Solozhentsev [4], R. A. Timofeev [5], Yu.V. Yakutin [6], and others.

However, in the light of highly dynamic transformation processes, so characteristic of the digital economy, there remains insufficient focus on elements of its financial infrastructure within the fuel and energy complex, which necessitates additional research on the topic.

2. Methods

The study's methodological basis is grounded in the systemic approach, methods of scientific abstraction, analysis and synthesis, the dialectical method of enquiry into economic phenomena, and concepts of the digital economy. To help resolve particular objectives, the authors employed the following groups of methods: (1) theoretical summarization, logical, scientific abstraction, association, and analogy (to explore and summarize key elements of the financial infrastructure of the digital economy within the fuel and energy complex); (2) methods of systems analysis, summarization, and comparison (to explore existing methodological approaches to and methods for diagnosing the management of the financial infrastructure of the digital economy).

The study's information basis is relevant statutes, laws, and regulations, statistical materials from federal and local authorities, and publications by domestic and foreign scholars focused on research into elements of the financial infrastructure of the digital economy within the fuel and energy complex [7, 8, 9].

As part of this study, the authors sought to develop a set of approaches to the management of components of the financial infrastructure of the digital economy within the fuel and energy complex and substantiate a set of strategies for managing finances within the fuel and energy complex. In addition, there was an objective to substantiate a set of techniques for evaluating the key factors underpinning financial infrastructure, as well as identify and formulate some of the key areas for the development of elements of the digital economy within the fuel and energy complex.

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3. Results

The concept of the digital economy emerged in the last decade of the 20th century. The present-day digital economy is the product of the development of the information society in the last 30–35 years. The idea of the digital economy represents a departure from concepts of the information economy, which is predicated on the theoretical basis of codifying information and implies using in nomenclature the terms 'network society' or 'network economy'.

Evidence from practice indicates that issues of the development of the network economy are best explored in economic discussions, which have helped identify the following key concepts of the digital economy: (1) relevant infrastructure (equipment, software, telecommunications, networks, etc.); (2) electronic business (conducted using computer networks); (3) electronic commerce (sale of goods and services through the Internet).

Yet, the intensive development of new forms of communication, like social networks and search systems, is dissolving the boundaries of the basis of the digital economy and is continually making it hard to make the distinction between various concepts and categories. It is worth noting that with the expansion of the use of digital technology and access to the Internet for large masses of users, the differences between the digital economy and the traditional one are increasingly getting erased, and it is becoming increasingly harder to tell the difference between their distinct characteristics.

To help resolve these issues, it may be worth resorting to the concept of the digital economy and attempting to divide the business sector into entities that employ digital technology to a certain extent and those that conduct their business entirely online. While in the global space a key factor in the development of the digital economy is creating a well-structured and well-regulated financial sector.

It is a nation's efficient financial infrastructure that drives the development of society and the national economy. Technological changes are among the more significant components of a model of economic growth. Consequently, the trend of accelerating technological changes has driven the emergence of a new philosophy of doing business and development of new strategies in companies. At the same time, shifting to a system wherein an asset acts as a means of settlement (external money) and is not used as a means of payment is in line with the evolutionary approach to money and is a dominant area for creating a more effective cashless economy. With that said, electronic money can be replaced with cash from the central bank, i.e. it is possible to fully replace a monetary asset used in exchanges of money. It is believed that communication costs could make the use of electronic money cheaper, while declines in costs and boosts in convenience, achieved through the use of electronic money, including interest on account balances, could significantly reduce the demand for cash.

Today, most financial markets are global and are developing entirely under the influence of information and computer technology. As a consequence, there continually emerge new forms and elements of financial infrastructure, like virtual banks, financial/technical companies, international electronic money systems, the digital currency market, etc. (Table 1).

Table 1: New Elements of the Financial Infrastructure of the Digital Economy within the Fuel and Energy Complex

Elements of the financial infrastructure of the digital economy within the fuel and energy complex	Classic business models	New digital forms and models
Financial institutions	Banking institutions	Virtual banks
	Financial intermediaries	Financial/technical companies
		International electronic money systems
Financial markets	Money market	Electronic (digital) currency market
Financial instruments	Loan and other lending agreements	Online loans
	Payment instruments	Payment services from information platforms
Financial services	Investments	Crowd-funding

It is worth noting that until recently the banking sector was one of the few sectors to employ information-and-communications technology, which is due to its predominantly non-material focus. At present, the rapid development of information-and-communications is causing changes in banks' business models based on the emergence of new forms of cooperation with entities within the market which provide various types of services. An example is banks that may open up a branch jointly with a network of cafés.

As regards the development of business models specifically, there is currently a trend of banking institutions strategically specializing in the 'traditional' versus 'novel' service categories. With that said, the first group comprises large "classic" banks and those with a focus on one single product (e.g., banks specializing on business banking services for enterprises within the fuel and energy complex). All these banks employ the latest information-and-communications technology, but their business models remain traditional.

The second group of banks includes banking institutions with whole new concepts of managing banking services for enterprises within the fuel and energy complex. A great deal of attention here is devoted to the various mobile services. As a result, banks are increasingly employing a system of managing the relationship with fuel and energy enterprises that is based on the use of social media. These banks, also, tend to employ digital signatures as opposed to usual ones.

Another novel component of the financial infrastructure of the digital economy is the emergence of so-called virtual banks for enterprises within the fuel and energy complex. A virtual bank may be construed as a virtual organization that generates economic value.

The main difference between these establishments and traditional multinational companies is the former's ability to react quickly to market changes and client needs. In essence, this is a financial intermediary between a fuel and energy enterprise and traditional banks and financial companies that, based on a special interface within the digital environment, provides financial services over the Internet in real time.

Among the key competencies of a virtual bank are the following: (1) the ability to obtain detailed information on a fuel and energy enterprise; recognize, and even anticipate, the needs of fuel and energy enterprises; (2) the ability to design a relevant solution that meets the needs of a client – in particular, the ability to combine different modules that are provided by different vendors for the purpose of putting together a package of services for a fuel and energy enterprise based on its relevant needs; (3) the availability of vendors that are capable of working out and providing custom services; (4) the ability to manage a network of vendors and ensure relevant interaction with clients (technologically and organizationally).

Today, most of the competition to banks is coming from the top information platforms Amazon and Alibaba. Announcements of plans to set up their own financial services have been made by Facebook and Google, with the Russian systems inclined to keep pace as well. Also, traditional settlement services are being replaced by electronic payment systems, which make it possible to carry out in real time all required transactions in a fast and convenient manner, with consequent savings in service costs and benefits from the use of a reliable protection system.

Today, one is increasingly witnessing the emergence of international online payment systems with clearing centres of their own, which do not need to be tied to existing money circulation systems.

An analysis of the development of international electronic systems for fuel and energy enterprises indicates that the way in the share of the use of electronic money by non-banking institutions among all of the payment instruments used by a nation is currently led by the United States.

As regards nations with a transformational economy, their performance in terms of fuel and energy enterprises using the international electronic money system is quite poor at the moment – around 1-2%. Dynamic growth in the volume of settlement operations through international electronic money systems is leading to changes both in individual parameters of a nation's financial market and in mechanisms underlying its overall operation.

A new service for users of financial services is the service of verification and monitoring of their financial expenditure and financial planning activity provided by so-called financial/technical companies. Some of the more popular and widely used companies in this area include BillGuard, Planwise, and OnDeck. This type of activity has become so successful lately that in 2017 alone private financial/technical companies brought in nearly $3 billion in investment into the fuel and energy complex. And it may already now be projected that digital services for financial infrastructure will remain an evolving field in the market for innovations within the information sphere.

The next stage in the development of the financial infrastructure of the digital economy was the process of its commercialization, i.e. enterprises within the fuel and energy complex getting access to financial services, and, as a consequence, new forms of investing emerging. This is how there emerged a new way to fund various ideas and projects of a commercial nature within the fuel and energy complex.

This method is known as 'crowd-funding', which implies donors investing their funds in facilities within the fuel and energy complex that are of interest to them, notwithstanding that these investments do not offer high financial returns. Research attests that there are three principal spheres that will jointly shape the key instruments of financial infrastructure within the fuel and energy complex: innovations, transparency, and broad access (Table 2).

Table 2: Key Areas for the Development of Digital Services for the Financial Infrastructure of the Fuel and Energy Complex

Factors for development	Effect and objectives
Innovations	The convergence of conservative financial systems and modern innovations within the financial sector will stimulate the development of business-models that will be facilitative of the future prosperity of enterprises within the fuel and energy complex.
Transparency	Transparency helps boost trust in all processes and enhance the throughput of transaction flows. The key factors are accessibility and security. This requires a significant level of international cooperation and sound procedure standardization initiatives within the fuel and energy complex.
Broad access	Accessible funding is a key factor for the proper activity of the future global community, which should enjoy fair resource distribution and proper access to resources, decent levels of well-being, efficient value exchanges, and adequate financial services.

Among the above-mentioned areas for development, special attention may need to be attached to the second one – a transparent financial infrastructure. The transparency of financial services helps boost trust in enterprises within the fuel and energy complex, while procedure standardization, which facilitates the identification of all key components in financial services, may help ensure a broader demand. However, there are certain areas that it is quite hard to make transparent.

4. Discussion

The reliability of the proposed approaches to the cultivation of elements of the financial infrastructure of the digital economy within the fuel and energy complex is substantiated by that many scholars today are talking about information asymmetry within the digital economy, which is the case with enterprises within the fuel and energy complex as well [10, 11, 12].

The formation of digital financial infrastructure implies investing in fuel and energy projects with a high degree of risk, which in the long run may, nonetheless, result in dividends and decent revenue for the donor. It is worth noting that this type of investing has been employed successfully around the world for several years now.

At the same time, in many countries national legislation oftentimes does not define most of the rights and obligations of subjects in a legal relationship that arises under the above type of investing, and may, thus, impede the active development of this progressive type of attracting funding. With that said, just about any segment of the financial infrastructure of the digital economy within the fuel and energy complex is witnessing today the emergence of new services, forms, and business models.

Asymmetric information exchange displayed by components of the digital economy within the fuel and energy complex is leading to inadequate decision making by consumers – which, for instance, is the case within the stock exchange market. Misinformation and flawed reports on business operations by entities within the market may spread just as fast as sound information. As a consequence, this may lead to various deviations within the market that are based exclusively on information asymmetry.

Thus, the quality of information within the digital economy system may cause significant fluctuations within financial markets, which are hard to foresee and control, as information flows generate millions of anonymous users around the world. On the whole, it may be noted that the digital economy is currently in the initial stages of its development, and, going forward, enterprises within the fuel and energy complex will have to overcome many more challenges to help enhance it and minimize risk.

5. Conclusion

To conclude, the formation of global financial architecture in the context of development of the digital economy within the fuel and energy complex is currently accompanied by a sharp acceleration in global cash flows and considerable growth in the international market for electronic money and electronic currencies. The development of the digital economy stimulates the emergence of new business models and financial systems and drives structural changes in the financial infrastructure of the global market, like creating virtual banks and financial/technical companies and launching new platforms for attracting investment through the Internet.

At the same time, owing to the informatization of the fuel and energy sector and the emergence of new financial technologies, a great many investors are finding it easier to access international markets these days. One is also witnessing a positive trend in the pace of growth in digital services for financial infrastructure, which are attracting significant volumes of investment, with the trend projected to intensify in the near future.

The study's findings indicate that in the digital economy it is the financial sphere that globalization has had the greatest effect on. Among the key factors in this area that will govern the effectiveness of components of the financial infrastructure of the digital economy within the fuel and energy complex are innovations, transparency, and broad access for most enterprises within the complex.

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