

The impact of the digital revolution on the Russian financial sector development and the results of economic transformation

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Abstract. The paper examines the impact of the digital revolution on the development of the Russian financial sector and the results of economic transformation. The authors substantiate the relevance by the fact that new opportunities for digital technologies and new regulatory rules are imposed on a complex international situation and an ambiguous global economic situation and create a very complex background for strategic planning of the development of small and medium-sized financial organizations. The authors built a model of the navigator of strategic approaches, made prerequisites for clarifying the model of the palette of strategies, created a new metamodel of digital transformations of a financial organization, created a new framework for building IT strategies, identified opportunities, limitations and obstacles to the implementation of competitive strategies of financial organizations in the context of digital transformations of the state economy. The directions for the development of digitalization in the banking sector of the Russian Federation are proposed: the introduction of a financial messaging system to reduce the dependence of the banking sector on international organizations, the introduction of regtech, the use of international experience, based on global trends in the use of fintech and digital technologies in general.

1 Introduction

Since the invention in the middle of the last century, information systems have overcome rapid evolutionary path, and after the invention of integrated circuit, doubling its capacity annually. Today, as it was noted by P. A. Kokhno, A. P. Kokhno, S. A. Karpov, thanks to the development of information computer systems and networks, it became possible to transform the economic order in a new paradigm – «digital» [6, p. 24]. Digital economy based on new information infrastructure allows new types of e-business to appear [9, p. 22]. At the same time, it becomes possible to obtain the maximum coverage of the population with goods and services, to automate or robotize any work, including eliminating the human factor altogether in many critical areas. In the digital economy, marginal costs are also significantly reduced, down to zero in some sectors of the economy, and thus digitalization solves many pressing problems of humanity.

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As G.I. Abdrazmanov and K.O. Vishnevsky, the transition to the digital economy is impossible without the information transformation of the state financial services system [4, p. 76]. Moreover, this sphere – one of those areas of human activity where the use of information technology can have a significant positive effect (for example, reducing costs by 25-90%) [1-12]. Historically, finance was the first commercial environment in which computing machines began to appear massively. Already from the beginning of the 50s, financial companies began to massively use computer technology. According to the position of S.V. Tikhonova, since the 80s, banks began to use electronic plastic cards as a means of payment, pattern recognition – for document processing, and international electronic networks – for money transfers [8, p. 13]. But, despite the historical primacy and potential positive effect, many researchers believe that banks are still not sufficiently aware of the impact of digitalization on their activities and are not actively introducing digital methods into their activities, lagging behind in digital transformations from such once archaic areas as trade and publishing.

The factors influencing the digitalization of the financial services sector on the digital transformation of the state's economy have long been recognized in the main economically developed countries, and, based on the new realities, legislative initiatives have been developed in the European Union, the Russian Federation, India and many other countries that regulate financial and payment services, as well as rethinking the role of banks in today's digital economy [5, p. 24]. At the same time, based on the different historical circumstances of the development of national financial systems, different approaches to reformat the financial environment have been proposed in different countries [6, p. 79]. Thus, legislative initiatives of the European Union (PSD2) are aimed at soft stimulation of the entry of new players from the environment of IT companies [26], and, for example, legislative practice in India is aimed at severely limiting the circulation of cash, indirectly stimulating the transition to a national mobile payment system, created by state stimulation of participants – the largest banks and mobile operators.

In the Russian Federation, banks with state participation are the main driver of digitalization [13-23]. Thus, the relevance of information transformation of banking as an element of the new digital economy of the Russian Federation is emphasized in the Strategy of Sberbank of the Russian Federation. According to its strategy, Sberbank plans to transform from traditional bank into digital information channel and an intelligent product development company [14]. Other leading banks in the country are developing similar plans. For example, VTB Bank recently commissioned the development of an information transformation strategy focusing on new flexible Agile management technologies from the world's leading consulting company McKinsey for a significant amount of 300 million rubles [13].

Problems, scientific terminology and methodological practice of economic sectors' digital transformations and individual enterprises, including in the field of financial services, are currently undergoing formation period. Rigorous scientific academic understanding of the processes taking place now is yet to come in the future. Given the sanctions regime imposed by Western countries on the supply of technologies to Russia, the task of developing and creating our own technological solutions, in the digital economy in particular, is one of the priorities for ensuring the country's economic and technological security. For the banking industry, the development of technology is an even higher priority, since historically, the banking industry has been a link between countries. Branches of foreign banks in the Russian Federation are a serious competitor, as they can use technological capabilities and innovation experience of parent companies.

The most important directions and conclusions of this study were formed based on the results of the analysis of theoretical, methodological and practical developments of domestic and foreign authors.

Digital economy is a fairly young field and not well understood. However, its ideas themselves are not new and can be found in works of such scientists as J. Schumpeter, K. Schwab, N. Negroponte. In Russia in works of scientists from the Russian Academy of Sciences, such as I.V. Avdeev, S. Yu. Archakova, A.V. Batova, P.A.Kokhno, A.P. Kokhno, S.A. Karpov, A.A. Melnikov, A. Yu. Trusova, A. I. Ilyina. Most digital economy ideas are published in scientific journals, voiced at scientific conferences, and also stem from the practice of technology companies. The financial technology industry has a longer history than the digital economy, but there are also not very many full-fledged scientific studies on this, due to the fact that most of the achievements, especially in recent years, are related to the field of high and IT technologies, and are difficult for non-specialists to understand. The study of financial technologies and its benefits and advantages for companies is currently held by consulting companies such as Ernst & Young, PricewaterhouseCoopers, KPMG.

The purpose of the article is to determine the impact of digital revolution on the Russian financial sector development and the results of economic transformation.

To achieve this goal, the following tasks will be solved:

- to reveal the essence of strategic approaches to business transformation in the turbulent conditions of digital transformations and to outline the ways to build digital transformation strategies;
- to analyze the factors influencing the implementation of financial sector digital transformation strategies;
- to analyze new opportunities for digital transformation in the field of financial services, based on the possibilities of the external environment;
- to develop approaches to creating strategic digital transformations of financial companies.

2 Materials and methods

Methods of systemic and structural analysis, expert assessments, methods of processing statistical information were used in the work. Fundamental and applied research on the selected topic, as well as the best practices of domestic and foreign organizations were used. The approaches used made it possible to ensure the validity of the conclusions and proposals.

3 Results

The most important factor in the macro environment, the reason for the low speed of digital transformation in the financial industry are barriers of state regulation. This industry seems to be the most regulated one, as far as KPMG completes ranking of the most difficult regulatory barriers to overcome. In 2018, the most significant barriers were (with examples from EU practice):

1. Cybersecurity and privacy protection. An example of tightening regulation laws EC – GDPR (General Data Protection Regulation) and SCV (Strong Customer Verigation) [24-28];
2. Monitoring and risk management control. Example – empowering local regulators in the EU with audit functions for directives PSD2 and AML [16];
3. Supervisory culture. Different supervisory culture and different historical approaches to supervisory practice in the EU will be reduced to a single strong denominator – new pan-European supervisory authority European Banking Authority (EBA) is established [27].

An example of how regulatory barriers and concerns about security and data protection slow down the introduction of new technologies is the use of public cloud services by

banks, which can still be used in the financial sector to a limited extent, and in the EU88 and RF89 laws restrict data storage in foreign countries [27].

The information transformation of licensed financial institutions as a whole takes place in the context of overall digital transformation of business [6, p. 6]. Improving customer experience, introducing self-service, straightening communication channels, remote service, round-the-clock support, global automation, centralized processing, and so on [20]. However, at the moment, the information transformation of financial business is complicated by the fact that there are two technologically different visions of the future of financial technologies.

Analyzing successful digital banking models, IBM proposed a classifier of four transformation models. IBM transformation models are shown in Table 1.

Table 1. Digital Banking Models by IBM

	Model A «Digital brand»	Model B «Digital sales channel»	Model C «Digital division»	Model D «Real bank»
Products, sales and marketing	Own capabilities			
	Own	Own	Own	Own
Sales channels	Rebrand the digital sales channels of the parent bank	Own	Own	Own
Back Office	Use the back office of the partner bank	Use the back office of the partner bank	Own	Own
ABS	No ABS	No ABS	No ABS	Own
Reliance on a traditional bank				

Model A. Reliance on a traditional bank. The justification of the model is as follows: many traditional banks have found it difficult to find common ground with the millennial generation, and conversely, traditional customers are against digital innovation. To resolve this contradiction, so as not to dilute its branding for traditional customers, the bank creates a new brand, with a unique proposal aimed strictly at the target group. Such an offer is branded as «new» bank, based on traditional bank infrastructure. Examples of this model are: FRANK by OCBC in Singapore and the LKXA program of the Spanish bank CaixaBank [25]. In the author's opinion, the LKXA example is not consistent, since it is more a marketing program for youth products than a brand, but the line is fine [10, p. 65].

Model B. Digital bank as a distribution channel. Many entrepreneurs and progressive bankers are seeing a gap between the service customers want and the offering of traditional banks. It is this gap that can offer new business opportunities. Unlike Digital Banking Model A, Model B organizations are based on the belief that new customer service experiences require more engagement than simple branding, so they develop and offer an online mobile application that focuses on specific customer needs. On the other hand, in order not to build their own bank from scratch, which is costly and is subject to banking regulation, such companies usually use a real bank as a partner that conducts real transactions, often also reselling the products of the partner bank. Examples of this approach in the United States are Simple and Moven. There are also examples of this approach in Russia – Rocketbank and Tochka [8, 3. 35].

Model C. Digital bank as a unit. Many banking innovators are trying to create more than just a unique offer for the client, but also end-to-end «digital» business model. Typically, at the first stage of planning, they find that the existing organization is incapable of creative rethinking and incapable of change. Large banks also often find that their existing banking systems are too rigid and rigid to meet the needs of a digital bank.

Model D. Only this model is a real digital bank. The model is aimed at creating a real digital bank, where the main competitive advantage is the digital core. Such a bank does not necessarily operate without branches, rather, the customers of such a bank primarily expect interaction with their bank through digital channels. Some banks operating on this model do not really have branches at all, while others combine digital channels with face-to-face communication in financial centers, cafes, or even via video chats. Examples: Fidor Bank and N26 in Germany [18]. In Russia, with a certain assumption, Tinkoff Bank operates within this model. For all its merits, the IBM approach does not address the following factors – models A and C – are models of transformation of the existing banking business, and models B and D – are models for creating new business. In addition, analyzing the entire world experience, the issue of concentration of certain models of digital financial business by country remained behind the scenes [11, p. 67]. By the way, the issue of the distribution of models by country requires its own research, but a quick look at the financial technologies landscape suggests that, for example, type C models are concentrated in countries where there is no regulation of financial intermediaries and venture capital is readily available. Conversely, D models emerge in highly regulated markets. That is, the two problems described in the previous chapters radically affect the choice of a development model.

The combination of strong regulation with difficult access makes the choice of creating a real digital bank according to Model D simply predetermined.

Despite the fact that this classifier was originally intended for banks, it can be easily expanded to all types of financial institutions. Noting that the distribution of models by country still requires a researcher, it can be noted that there is an additional correlation associated with the historical state of the banking system and historical client preferences. Historical factors should not be neglected. For example, historically, the United States is a country of checks, where there is still the only nationwide ACH clearing and settlement system based on the check settlement model. In addition, giving salary by check in an envelope in the US is a habit and a value that is hard to give up. Therefore, huge funds were spent in the USA on the check process digitalization (Check 21) and the creation of artificial intelligence systems that verify signatures in digital images of checks [12]. At the same time, the process of digital transformation of checks continues – this is how a mobile application for accepting checks and a system for issuing virtual checks was developed [22].

For several years Russia has been actively involved in the development of its digital economy [24]. «Digital economy of the Russian Federation» Program was approved by the order of the Government of the Russian Federation dated July 28, 2017 No 1632-r with significant changes regarding the project presented by the Ministry of Communications [2]. May 7, 2018 Decree No 204 of the President of the Russian Federation «On national goals and strategic objectives for the development of the Russian Federation for the period up to 2024» was signed. It approved 12 directions of Russian strategic development [3]. Number 9 is the national project «Digital economy». According to the «Digital economy of the Russian Federation» national project, Russia has all the necessary prerequisites for further realizing its digital potential and accelerating the pace of digitalization, which will create a synergistic effect and lead to the overall growth of the Russian economy [4].

Despite the fact that the main problems of digitalization in our country and its solutions are drawn up and described in the national project, it does not take into account a number of economic indicators that affect the development of electronic commerce in circulation and its stimulation, and the increase in technological jobs in the overall structure of employment. There is also no information on stimulating high-tech exports, and other indicators that are directly related to the digitalization of the economy. In particular, the program did not include a critical issue – stimulating Russian business towards

digitalization, especially medium and large ones. Figure 1 shows the forecast dynamics of this indicator:

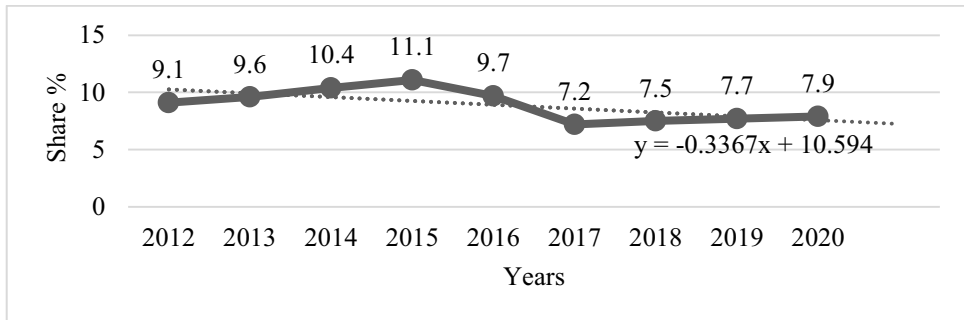


Fig. 1. Forecast dynamics of the share of organizations engaged in technological innovation, % [14]

Based on Figure 1, we can say that the share of organizations engaged in technological innovation has an upward trend, but the growth rate is extremely low, which indicates the weak attractiveness of innovations for Russian small and medium-sized companies. The significance of digitalization of the country's economy at the present stage is enormous, for example, one can estimate the contribution of digitalization to GDP growth until 2030:

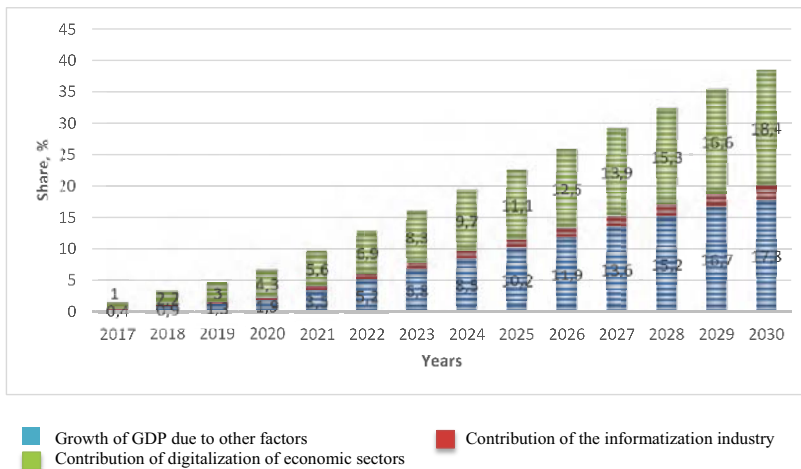


Fig. 2. Assessment of the cumulative contribution of digitalization to GDP growth, % [14]

Diagram 2 shows that by 2030 GDP growth will be more than half associated with digitalization (1,47% of 2,75% of annual GDP growth), this is primarily achieved as a result of increasing the efficiency and competitiveness of all sectors of the economy. The additional effect will also provide the growth of the information industry.

As we can see, the program «digital economy» is being converted to the «digital economy» national project which maintaining the already developed and started implementation of five directions. The goals of the development of financial technologies in the Russian Federation according to the «main directions» of the Central Bank are: promoting competition in the financial market; increasing the availability, quality and range of financial services; reducing risks and costs in the financial sector; increasing the level of competitiveness of Russian technologies. Although the program of the Central Bank of the Russian Federation can hardly be called radical, breakthrough, or even ambitious, nevertheless, it is a completely progressive digital strategic program, which provides for the

introduction of the most relevant modern technologies [15]. The implementation of the program should create a new financial ecosystem in the Russian Federation by 2022, albeit on top of old institutions. We can say that the strategy of the Russian Federation in the field of transformation of the financial sector is classical and conservative. However, it involves the introduction of digital technologies that have proven their effectiveness in other countries.

4 Discussion

Main characteristics of the Russian market – this is a market dominated by payment cards as a payment instrument and consumer credit as the main financial instrument.

The leading consulting company Erns & Young publishes analytics and forecasts for the development of the financial technology market in the Russian Federation in recent years. According to this analytics, in the coming years (until 2035) there will be an increase in fintech services [1], primarily due to small and medium-sized businesses, where the penetration of financial institutions is now only 54% [12]. At the same time, in the field of insurance, digitalization is possible only to reduce the cost due to high competition, and low profitability of deposits will increase the interest of the population in passive investments by 47% [14]. Growth potential by destination are: non-bank money transfers – 7%, mobile payments – 30%, neobanks – 26%, telematics-based auto insurance – 31% [13], online budgeting and financial planning – 25% [15].

Despite the fairly distributed landscape of financial technology companies in Russia, we note the lack of visionary approaches in the development of Russian financial technologies. There are no financial tech companies in the IoT segment either. Attention is drawn to the fact that there is no synergy between Russian financial technology projects and the opportunities provided by Russian development programs.

Based on the above data, we will create our own metamodel of digital transformation, which is ambivalent both to a specific strategy and to specific technologies and methods of implementation. The constructed framework is not universal, since it is based only on digital technologies and innovations, despite the fact that the progress of science and humanity is carried out not only in the direction of digital technologies, but biotechnology, quantum computing and in the development of space programs. The metamodel is based on the frameworks presented in the first part of the article, these are CapGemini and «Digital pyramid» frameworks. The proposed metamodel tries to generalize them, bring them to a strategic level, showing the connections between the external environment, vision, progress, technology, innovation, and the internal environment of the organization, business model, value chain, operations and products/marketing. Taking the approach of A.Yu. Trusova and A.I. Ilyina, that the fundamental difference between the created model and most other frameworks is the element, which is called «opportunity filter». It consists of the features of the business culture of the external environment and the values of stakeholders [9, p. 76]. Despite the fact that in general, the author of the article considers only democratic capitalist countries, there are differences in culture and approach to business, which, in the field of, at least, financial transformation, fundamentally affect possible digital transformation strategies. The metamodel is shown in the figure 3.

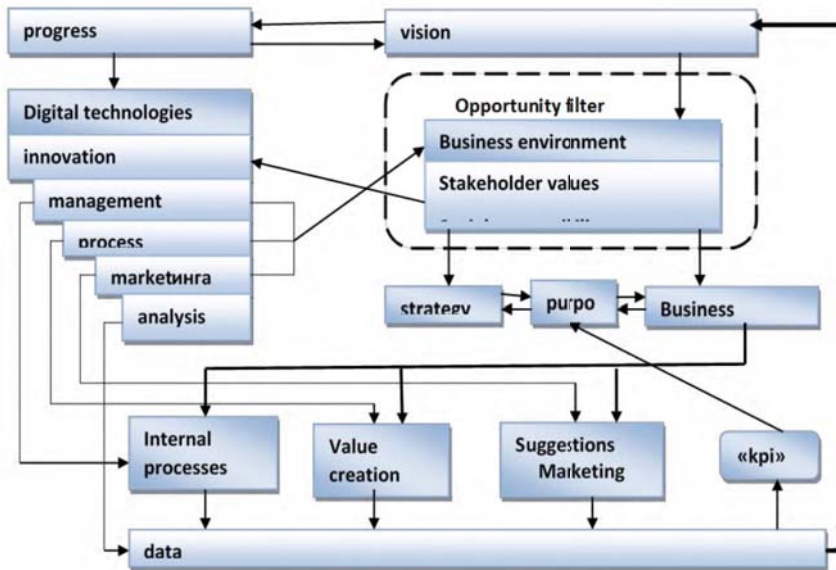


Fig. 3. Meta-framework for digital transformation [9]

In the constructed model, at the top level is the vision, which is based on progress, and passing through the «filter of opportunities» of the environment and values, forms the goals, strategy and business model. The model is ambivalent to strategy models. This can be both a model of rethinking from the basic principle (first principle), and a classical model of the evolution of the current system, as well as a formative, visionary or renovation strategy.

Based on the business model, new digital business processes, value chains, digital offerings and its marketing are formed through the use of new digital technologies. The decision-making base is big data, which, using new AI-based analysis technologies, is transformed into decisions, corrective, strategy, goals, business model and even vision.

The technologies that underlie the process, in this case – open APIs for access to government services, credit bureaus, risk management and scoring, can be based on big data and artificial intelligence, provided in the cloud, as IaaS, or provided by a provider in the cloud, as SaaS or PaaS. If the client is not registered in the national ID database or is not a resident, it is still possible to identify him remotely in this case, but using other services and technologies. The client will be required to provide documents remotely online, then these documents are analyzed by document recognition programs, security elements are checked, documents are verified against databases, including the databases of lost documents, the client is asked to take a photo (or start a video stream on your phone), so the client's face is compared with the document, and with a positive conclusion about identification, the information is submitted to the KYC system (know your customer) to determine the address, if the client is not a resident, then he is checked against international sanctions lists, depending on the country, legal analysis may be applied (legal tech) to define bilateral tax treaties and disclosure obligations (for example, under an OECD agreement) and then the customer verification path is the same as for a customer with a digital identity. The main principle of technology selection – seamless user experience (UX).

Another priority area for the development of digital technologies and financial technologies in the banking sector should be the provision of regulatory services.

Regulatory technologies – is a branch of financial technology that uses information technology to ensure easier, faster and more efficient compliance with the requirements of financial market regulators. The use of regulatory technologies will allow to reduce the costs of bank clients associated with paperwork, preparation of reports, and will also allow regulatory technologies services clients to check clients for compliance with the bona fide counterparties [11, p. 34]. The provision of services by banks to regulatory technologies can also help the Russian economy as a whole, in connection with the government's attempts to take control of the activities of the so-called «self-employed». Simplifying the procedure for registering as self-employed can help bring this segment of the population out of the shadows. Also, regulatory technologies services may be of interest to small businesses, which can simplify accounting, financial and tax reporting. Taking into account the low population density in most of the territory of Russia (the average population density in the country as a whole is 8.57 people/km²), the development of branches in remote and sparsely populated areas is not profitable. In this case, the solution should be the development of technologies in banks [15]. To provide the population of these areas with banking services and reduce the existing digital divide, it is necessary to develop technologies for mobile banking and the provision of services via the Internet for these regions. Another important direction in the development of the banking industry, which is not directly related to digitalization, but has a direct relationship, is the improvement of the legislative framework to ensure the legality of activities and the use of digital technologies in the provision of services. It will also provide a simpler and smoother transition to digital services that are citizen-friendly and cost-effective for banking and financial institutions, which in turn will increase their investment attractiveness. And increased digitalization of the banking sector can also give impetus to the development of the information technology sector. Therefore, the Central Bank and relevant ministries (Communications, Economic Development) should put more effort into writing draft laws regulating the field of financial technologies and the digital economy.

5 Conclusion

Digital transformation projects are based on the application of revolutionary digital technologies in various fields of human activity, including all economic sectors where the processes of replacing humans with artificial intelligence are taking place: robotization and changes in the process of human interaction with the environment, mobilization, digitalization.

Combining approaches and concepts of digital transformation with concepts of strategic development – non-trivial task. The market successes of fully digital companies without a classical strategy, based on vision, constant adaptation and rethinking things from basic principles, have led to the destruction of the classic concepts of competitive strategies and competitive advantage. The general research consensus is that it is no longer possible to build a strategy based on sustainable competitive advantage; one should be flexible and often change strategic approaches in various aspects of one's activities.

Despite the fact that the financial services industry has historically been one of the first to start automation, it currently lags behind other sectors of the economy in terms of the pace of digitalization.

Among the reasons for the lag in the financial services industry – technological (expensive outdated systems and infrastructure), demographic (growth in life expectancy, force of habit), cultural (generational values, different national traditions). Core vision for the future of financial services – seamless user experience. At the same time, there is no consensus on the basis of what technologies this experience will be implemented. Relying on different, conditioned by culture, traditions, economic condition and ambitions,

government bodies of different countries pursue completely different policies of digitalization of the economies of their states. This has the greatest impact on the highly regulated financial services industry. The above-mentioned factor, together with global political factors, determine the turbulence of the environment for the implementation of the strategy of sustainable competitive advantage. In some situations, for companies that have overcome regulatory barriers to market entry in the EU and the Russian Federation, it is possible to create a strategy with a stable competitive advantage at some time. To build such a strategy, one can use the tools developed by the author for the metamodel of digitalization of the financial services industry and the framework for digital transformation of the infrastructure of a financial organization.

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