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# Digitalization of the Banking System: Risks and Opportunities for Managing Financial Assets

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**ABSTRACT**

All sectors of economic activity have changed significantly in globalization, and the banking sector is no exception. Commercial banks around the globe are experiencing digitalization in different ways. However, in the near future, most of these organizations will most likely have to face this process. Otherwise, they simply cannot compete, as the needs of the client base are changing along with continuous technological progress. People are interested in being able to receive services and feedback from the bank quickly and remotely. In order to remain competitive, financial institutions create a new corporate culture, developing and implementing innovative models of interaction with clients. The purpose of the research is to determine the principles of economic security in digitalization of the banking sector and ensure the stability of its functioning, considering possible risks. This study can be useful both for employees of commercial banks for building the processes of digitization of the services provided, and for IT specialists responsible for the development and implementation of certain digital products.

**Keywords:** digital transformation; credit institutions; bank; banking system; digital economy; artificial intelligence

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## INTRODUCTION

Banks — are an integral part of the economic and financial system to which the majority of the population refers every day: so, almost every person makes at least one transaction per day — for example, a transfer or payment. Therefore, with the growth of consumer demand and criteria important for the customer base in terms of choosing a service provider, banks need to continuously monitor new technological solutions, timely implementation of which will contribute to improving the level of service. The digitization process is therefore likely to be a natural rather than a necessary stage of growth for banks. It is also important to note that the rate of development of mobile banking at the moment significantly ahead of similar indicators for online banking. As there is a high demand for new information technologies from consumers of this type of service, digitalization is actively implemented in the banking sector and various financial institutions. This process was particularly relevant at a time when the adverse epidemiological situation caused by the COVID-19 pandemic was difficult, and already had an impact on financial stability, which refers to the uninterrupted operation of the relevant agencies of the system and their high degree of reliability against possible threats. Central banks provide financial stability. The systems they build have a direct impact on both economic and political sustainability (i.e. to ensure that the State's economy is functions correctly). This is particularly important given that the banking sector is much more likely to be exposed to risks than other industries.

To be effective, companies should have economic security services based on the following principles:

- Legality.

All work processes (including those that ensure economic security) should be carried out exclusively on legitimate grounds enshrined in Russian and international legislation.

- Economic feasibility.

It is important to protect the facility only if the cost does not exceed the potential loss in the event of a threat.

Range of reactive and preventive measures.

Reactive measures are taken when there are real security threats — their key objective is to quickly and effectively minimize adverse effects that may result in economic or reputational losses. Preventive measures include measures to prevent and block possible threats.

- Continuity.

The company's economic security service must work continuously.

- Differentiation.

The nature and degree of the threat directly affects the company's efforts to stabilize the situation and combat potential negative effects.

- Coordinated action.

In order for the department of economic security to perform its functions correctly, it is important to establish close cooperation between all entities within the company.

- Complete control.

The economic security service must fully comply with the decisions of the company's management.

## THE DIFFERENCE BETWEEN ONLINE AND DIGITAL BANKING

Online banking primarily focuses on money transfers, payment of bills, remote deposits and basic online account management. Synonyms to this concept are “virtual banking”, “internet banking” and “e-banking”.

Digital banking is the digitization of each program and activity carried out by financial institutions and their clients.

Advantages of digitization include:

- Increase number of non-cash transactions and conditions for their execution (for example, a large number of ATMs) contributes to significant savings for both the customer base and the banking organizations themselves.
- Digital analytics available to banks allows more effective decision-making.
- Growth of the customer base due to the fact that interaction with the bank becomes more convenient.
- Reduced number of operational errors because of the human factor.
- Reduced need for large amounts of cash.
- Reduction urban and rural customer service differences.
- Reduced the threat of counterfeit currency creation and distribution (through increased non-cash transactions).

### ADVANTAGES AND DISADVANTAGES OF DIGITIZATION IN THE BANKING SECTOR

Digitalization can help banks reduce costs and optimize customer service. Although the introduction of IT solutions is usually expensive, and new digital banking tools are not always well received by customers, then development a clear vision of digitalization will allow banks to overcome emerging challenges. Smooth implementation, integration and adoption of new digital tools within the company and convince employees of the importance of transition to digital services and online banking tools (they will be more receptive to digitalization, strategically reducing internal conflicts, and will be able to better explain the use of such new tools to clients).

Aligning the internal organizational culture with the type of products and services it offers is crucial to maximizing its marketing efforts and ultimately the performance of firms.

The disadvantages of digitization in the banking sector can be attributed:

- Significant reduction in human resource requirements due to wide application of various automation programs.
- Reduction of the number of bank branches, which entails reduction of jobs and complicates interaction with the Bank of consumers of services from the category "50+" do not feel comfort when working with digital channels.
- Vulnerability of most banking institutions to cyber attacks.

In the future, banking systems with their own form of artificial intelligence are probably waiting for us, and some tools for interaction with clients with its use (for example, ChatBots) are already implemented. This is just the beginning. Artificial intelligence has the potential to change organizations on a huge scale — from virtual financial assistants to computerized credit scoring and predictive analysis.

From the point of view of customers, machine learning contributes to the effective improvement of experience in the application of banking products, and helps to solve emerging issues quickly and efficiently. Artificial intelligence, in the near future, will allow banks to identify the range of problems of service consumers and deal with them very quickly and at no significant financial cost. This will lead to the transformation of the banking industry, and with it the client experience of interaction with a particular development. Banking organizations should regularly monitor the emergence of new

technological opportunities and quickly implement them for continuous business development.

Based on the above, it can be concluded that for mass attraction of clients it is necessary not only to develop an interesting and quality product, but also to provide a comfortable and continuous process of its use. It is especially difficult to reaching the consumer in a highly competitive environment, as the banking sector is very wide and the service of various agencies in the industry in terms of providing their products becomes identical [1]. In addition, there is the possibility of simultaneous registration of several products without the physical presence of the client (including online lending). The need to create individual, bank-specific technologies and methodologies developed using high-performance digital resources becomes relevant [2].

The introduction of banking digital platforms is aimed at creating both new benefits for customers and creating their own ecosystem. The emergence of services focused on small business (for example, online accounting, operational accounting, automatic forecasting of profits) that will be able to enter it, will allow much better and more accurate consideration of the needs of consumers.

### **DIVERSIFICATION OF BANK RISK**

It is important to note that digitization creates about 70% of digital risks for banks. According to the analysis, 22% of banks worldwide allocated more than 1/4 of the annual budget for digitalization of risk management [3].

Diversification of bank risks is a key method for ensuring the stable development of financial institutions in the global economy, and its effective

management requires a new strategy within the framework of digitalization. This is particularly important as diversification of credit portfolio has a significant impact on profit growth and overall risk reduction.

In developing countries (such as Malaysia, Thailand, the Philippines, Indonesia and Vietnam), the impact of several strategies to diversify operational risks was analyzed and it was concluded that they had a positive impact on the competitiveness of banking institutions, and to improve the stability of financial institutions [4]. For example, Thailand and Indonesia noted significant impacts on their overall performance and risk management in particular. And in the Philippines, diversification does not affect profits, but generally has a positive impact on bank performance. In Malaysia, however, after asset diversification, profits declined and risk management was characterized as more effective [5]. In Vietnam, this process practically does not affect banks, as the market in the country is poorly developed [6]. Asian banks diversify interest-free assets and services that are not credit-related rather than credit activities in order to increase returns under liberalization [7]. This experience is very useful for developing countries, as it can help to gain additional knowledge on diversification, if the financial sectors are liberalized [8]. The diversification of investment portfolios could have a positive impact on increasing returns, reducing risk of sharp decline in stock prices and improving performance. As a result, banking organizations attract additional investment [9–14] and have less impact on the markets that are associated with them [15]. Research conducted in China has shown that bank diversification increases market share, net margin and non-interest income, and operating costs [16].

## NECESSITY AN ADAPTED REGULATORY FRAMEWORKS

In order to digitize banking services as quickly as possible, it is essential that the country has a properly adapted regulatory framework.

It is important to understand that mobile banking has a high risk of online fraud, which casts doubt the reliability of smartphones in the near future [17]. The key goal of all work is to create a special protection mechanism for a huge stratum of data to enhance the cyber security of banks [18, 19] — many small industry organizations lack the necessary financial resources to do this [20].

In addition, one of the key problems is to create a set of regulatory and supervisory requirements, i.e. to amend the existing regulatory framework, to regulate existing threats [21] and effectively develop the banking sector [22].

## E-SERVICES AND MOBILE PAYMENTS

There is relatively little of analytical data on mobile payment ecosystems, which is an important tool for enabling clients to track information independently (without having to go through a bank) [23]. To ensure continuous online access to an impressive amount of information, it is important to conduct research to determine appropriate pricing policies and make logical decisions for banks to provide electronic services [24]. Digitalization plays an important role in continuous customer service in European countries [25].

Introduction of the Payment Service Directive PSD 2,<sup>1</sup> entry of Google and

<sup>1</sup> PSD 2 (Payment Service Directive 2) — the amended Payment Services Directive, which aims to develop the market for electronic payments and to create an enabling environment

Apple into the payment services market and the continuous growth of the financial technology (fintech) industry, these forces banks and other financial institutions to innovate and strive for such a method of work, which will not be contrary to constantly updated customer requests. This is the reason for the emergence of “electronic banking” — a special system that allows them to receive information and manage accounts remotely [26].

Electronic services provided by banks include:

- 1) client account statements;
- 2) information about bank products (deposits, credits, securities);
- 3) applications for deposits and loans and bank cards;
- 4) domestic transfers to bank accounts;
- 5) transfers to accounts in other banks;
- 6) currency conversion.

While the first two services require only mobile communications, the rest generally require Internet connectivity.

## FEATURES OF IMPLEMENTATION OF ONLINE BANKING

In parallel, the use of blockchain technologies, the building of a hybrid process of interaction with the client base, as well as the presence of network competition can be considered as new points of growth, identified because of research of information systems. For example, the popularity of cryptocurrency and crowdfunding in recent years pushes banks with the traditional system to change business models.

Scandinavian countries have a high level of digitalization, which is essential to overcome temporary and space constraints

for secure payments, thereby increasing the ability to make payments.



(which become critical for customers). The percentage of implementation of online banking is from 89 to 93% (according to Statista, 2019) in Denmark, Norway and Finland now, while the same rate does not exceed 7% in Romania and Bulgaria and it reaches 59% in Austria and Germany. It can thus be concluded that the perception of digitalization by financial institutions varies from country to country. However, the inherent ability of banks to consider it as a motive for further adaptation and for finding ways to generate new income in times of technological change has not been previously explored.

Every year, more and more banks close their branches, leaving only the head offices, or completely move into the field of online services [27, 28]; but with such significant changes in the work of the Russian problem, which prevents banks from transferring their activities to the digital environment (which is a more profitable niche for business), the older generation becomes unprepared to transition to the digital format of service.

UX- and UI-design, application and perceived utility of digital products (such as online banking instrumentation) cannot be equally targeted to all audiences, in particular older customers. That is, a conservative approach can be considered more profitable for banking organizations. In addition, Banker, Chen, Liu and Ou companies [29] have determined in 2009 that online services have a positive impact on economic efficiency, but are not very effective in terms of sales growth. In the past, conventional channels guaranteed this, although they were expensive, which means that they can still have an overall positive effect. That is, banks that decide to postpone digitalization for a while may remain equally successful in terms of

profitability. This is particularly true for countries that are still in the process in the transition to new technologies.

Presumably not only the degree of digitalization, but also the extent to which financial organizations “accept” it strategically and use its opportunities in the market, is crucial for achieving a competitive advantage. Banks can develop a vision and implement coherent packages or new online services as part of their business strategy, or will operate without such a clear development program. They also have the potential to adopt different approaches to digitization, with different levels of entrepreneurial intensity. The non-entrepreneurial approach could be described as a “wait and see” approach where banks introduce services and online features that have been successful. Business approach (entrepreneurial) to digitalization, by contrast, is to introduce innovative online services before competitors, taking into account that these services may not lead to additional sales, profitability and/or customer satisfaction.

By focusing on innovation and initiative, banks will be more active in seeking new market opportunities and exploiting them more quickly. In this way, some financial companies will be able to better develop new market segments and attract new customers, as well as provide innovative solutions and products to existing ones. In addition, the focus on innovation makes banks more flexible to the changing requirements of customers, the emerging resources allow their top managers to be more aware and effectively explore new digital market opportunities and assess the risks associated with them. However, the latter may lead to more diverse results in terms of profitability. Nevertheless, it is generally expected that such work will be positive.

For large banks, they continue to focus on effective transfer systems and strategies. The conclusions of 2012 by Nüesch, Puschmann and Alt [30] confirm that such financial institutions are just beginning to explore digital services, and most of them provide only basic — such as instant messaging, wiki-cite, blogs and rating applications. This minimizes costs but threatens the business potential to attract new customers, strengthen relationships with existing ones and win their loyalty, as well as cross sales.

### **INTEGRAL, MULTIFUNCTIONAL AND MOBILE BANKING**

Additional opportunities for intensifying customer relations with digital technologies — integrated, multifunctional and mobile banking. The first provides the client with greater transparency — he can get the same information that is available to the banking consultant. A key advantage of multifunctional banking is the ability to use various tools — such as computers, telephones and local banks for banking operations. Similarly, mobile banking is mainly linked to the ability to obtain banking services through mobile devices without time and location restrictions.

However, if necessary, customers still hope on personal contact with bank employees to obtain information and meet their needs; and human factor is not always positive. From this perspective, digital technology can be a useful tool for improving service quality.

Changes in business relationships can also be observed on stock exchanges. Digital trading platforms change the relevance of established exchanges, and suppliers, in order to survive in a highly competitive environment, have to be radically rebuild permanently of business models or adapt new ones, including allowing credit

transactions through online platforms, thereby changing the algorithm of banks and credit institutions. The initial competence of the latter was to act as intermediaries. Now non-bank organizations are beginning to compete with traditional participants in the financial services industry — even a new term “open point banking” has appeared. A 2012 research by Sachse et al [31] showed that half of the respondents were already interested in using the services of these non-bank institutions. This indicates a market trend towards heterogeneity, with an increasing number of bank’s rejection of intermediation.

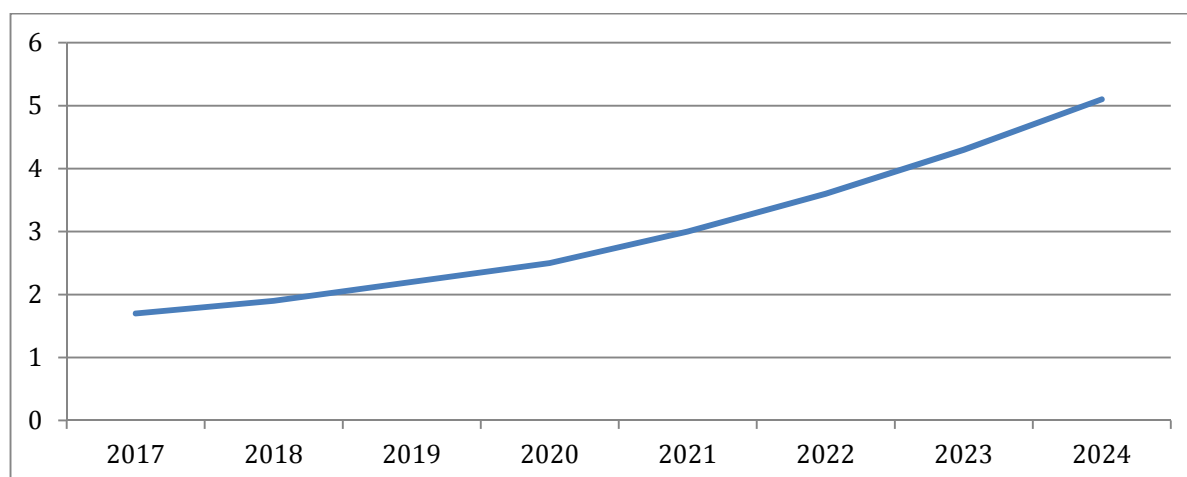
Information is increasingly digitized, customers no longer rely on bank branches for their services; experts compete not only with each other, but also with complex technological innovations.

### **FEATURES OF ONLINE BANKING**

Banks that have already digitized their services and passed to online banking have additional opportunities: for example, actively adapting their business models for dynamic currency conversion, which often requires the use of IT applications.

In doing so, it is important to understand that smaller financial organizations have fewer opportunities — they may have difficulties due to limited budgets. This is especially relevant when it comes to developing new tools for online banking. However, their current digital systems may be less complex, allowing for more innovative digital solutions.

To date, there are banks whose business model is based on the complete abandonment of offices and the use of only online platforms. An example in Russia is “Tinkoff Bank”, which has no branches and carries out all interaction with the client through the mobile application. This



*Fig. Domestic costs for the development of the digital economy as a percentage of GDP*

Source: compiled by the author based on data from the Higher School of Economics. URL: [https://www.tadviser.ru/index.php/Статья: Цифровая\\_экономика\\_России](https://www.tadviser.ru/index.php/Статья: Цифровая_экономика_России)

service has become very popular because it allows you to receive services 24 hours a day, without leaving home. However, this model has its drawbacks: the amount of work assigned to the bank is becoming many times larger and requires staff with skills to work in the digital economy. Therefore, the most important task of such institutions is the appropriate training of personnel in technology and the implementation of their activities online.

### KEY TECHNOLOGIES OF DIGITAL TRANSFORMATION OF BANKS IN RUSSIA

Progress in digital technology allow banks to operate more efficiently [32]. According to the information received from financial institutions in 2022, it is possible to distinguish 5 key technologies of digital transformation of banks in Russia, which they plan to develop:

- **Cyber security.** In 2022 and in the following years this topic will be relevant due to the fact that the further the process of digitalization of banking services, the more often there is a question of preservation

of information and its processing [33–35]. Protecting customers' personal data will require substantial investment to maintain competitiveness in this market segment.

- **Payment.** Due to the epidemiological situation in the world, the share of non-cash payments has increased significantly, so banks are interested in making payments “through themselves” and receiving commissions [36–38].

- **Artificial intelligence.** The development of technologies associated with it will not lose relevance because, allowing to work with databases, it plays a huge role in terms of targeting banking products in the context of intense competition.

- **Improving customer experience.** Significant increase in customer base due to new users is unlikely; therefore, there is a need to improve the existing experience to work with current clients (in certain target audiences) and, in parallel, to attract new ones. Conservative banks are oriented to consumers of their services from the category of “50+”, do not feel comfortable when working with digital channels and do not trust virtual funds, therefore,



it is necessary to focus on software simplification for this target audience.

- Digital mortgage. Currently, mortgage lending shows stable and high growth — therefore, a more rapid document management would help to provide the time required for more data processing that is detailed.

### DISADVANTAGES TO IMPLEMENT THE NEW TECHNOLOGIES

Investment in digitalizing the economy continues to increase, as shown in the *figure*.

Digital transformation is now a key factor in the competitiveness of banks. The introduction of new technologies is in great demand by the society, which has fully appreciated the advantages of online banking services, especially since, according to the company's research, McKinsey Global Inc. "Digital Russia: new reality",<sup>2</sup> by 2017 about 60% of Russian population used smartphones. Market share of contactless rapidly increasing, as well as mobile payments and services operating on the P2P system. The concept of modern digital banks implies, among other things, the rapid implementation of customer-oriented innovative solutions.<sup>3</sup>

The following are some of the highlights that, despite the obvious advantages, the use of the latest digital technologies also entails a range of problems that require rapid analytical work.

- Shortage of personnel with appropriate qualifications. For information, systems to

work correctly and efficiently, competent professionals must maintain them, and such staff should be knowledgeable both as administrators and as users. The constant updating of digital technologies significantly complicates the process of finding suitable staff, which entails the need for continuous staff development. The solution for banks is to use the experience of foreign financial institutions, to improve the organization of training of their employees, to train young specialists in this field, as well as to change the working hours of personnel to a more flexible and hybrid [39].

- Information security. Transfer most of the information base to the digital environment entails the risk of data loss, as a result of hacker attacks or errors in their use, which threatens banks with loss of customer loyalty and their leaving, and to customers — by access to their personal data by third parties [40, 41]. To avoid this, cooperation with highly qualified specialists in the field, continuous training of staff in accordance with modern criteria and, of course, operational work on the updating of banking systems is required.

- Errors in the operation of digital systems. As digitalization develops very quickly, there are great risks of program errors associated with automation of various processes within banks. Digital systems need to be monitored regularly in order to address possible problems quickly. It is also important to correctly assess potential threats — for all this organizations should allocate considerable amounts.

### RISK MANAGEMENT STRATEGY AND DIVERSIFICATION PERFORMANCE INDICATORS

It can be assumed that an analysis of the diversification of banks worldwide will reveal that the stable development of

<sup>2</sup> Digital Russia: new reality. Company's research McKinsey Global Inc.: URL: <https://www.mckinsey.com/~/media/mckinsey/locations/europe%20and%20middle%20east/russia/our%20insights/digital%20russia/digital-russia-report.ashx>

<sup>3</sup> Ministry of Digital Development, Connection and Mass Communications of the Russian Federation. Digital Economy of the Russian Federation. URL: <https://digital.gov.ru/activity/directions/858> (accessed on 08.03.2022).

the financial system is conditioned by a certain risk management strategy and methodology. In order to understand the needs of the customer base, it is important to establish permanent partnerships with foreign financial enterprises — this will help to create the conditions necessary for secure financial services and stable business growth.

To develop socio-economic activities should digitize banking processes, as well as work on the development of economic relations. It is important to pay attention to the fact that digitalization makes banking organizations vulnerable to cyberattacks, which can lead to certain reputational risks. That is, in the current circumstances, banks should work to attract additional investments aimed at prevention and operational prevention of risks of this type, as well as cooperate with interested organizations to exchange experience, including on this issue. All of the above are likely to have a positive impact on the profit growth of financial institutions. However, this is not the only objective indicator of the effectiveness of diversification. It is also necessary to monitor whether sales are increasing, whether client base and number of staff is growing. These factors will help track whether or not funds previously allocated for digitization are being repaid.

### CONCLUSION

Mobile and wireless communication market is one of the fastest growing markets in the world. New technologies and increased use of mobile devices and smartphones around the world have led to a new platform in the banking industry. Connecting a customer anytime and anywhere to his money and a set of necessary tools to manage them — a mandatory service that has become necessary in recent years. This causes the

emergence of a new generation of banking relations, which will be characterized by the most effective interaction with the customer base and, consequently, the operational satisfaction of all the needs of the latter. Financial organizations have a unique task to maintain and expand their customer base, as well as to quickly introduce new technologies and thus create additional competitive advantages. Convenience in online service combined with the presence of branches and ATMs have a significant impact on the prosperity of banks. New technologies should be used and adapted as necessary, so that they can develop continually and effectively.

Future research should focus on the processes of digitization of banking services and the identification of factors that determine the degree of their convenience for customers. This will allow not only to assess whether the products of banks meet the expectations of consumers, but also to propose ways of transforming banking operations in order to strengthen the financial stability of the latter. It is important to note that the most comprehensive and detailed analysis of digitizing business models with a high probability will require not one, but several scales to rank digital tools that reflect, for example, how much this process is used by different parts of the company: customer service departments, accounting departments. Ideally, subsequent research of such a plan should also assess which type of digitization tool is most suitable for wide application.

As rightly noted in a number of foreign materials and studies, digitization in commercial banks contributes to the optimization of a number of key processes and has a positive impact on the processes of interaction with customers in the

provision of banking services. The results of research study can be useful both to heads of departments and marketers of commercial banks for the subsequent development of the digitization of services. In addition, provisions and sections related

to cybersecurity and potential threats to mobile banking can help in the formation of requests and technical assignments for IT-professionals responsible for the development and implementation of certain digital products.

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