

Digital Transformation of the Russian Banking Sector in Terms of Pandemic

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Abstract—The article discusses the issues of development and implementation of digital technologies in the banking sector in the context of a pandemic. The concepts of “digitalization” and “digital transformation”, which underlie the transformation processes of banking activity, are defined. The authors have identified the most popular remote banking channels during COVID-19 pandemic. The extent of the impact of the pandemic on the Russian banking industry and the main electronic banking products and services contributing to the transformation of the banking business are noted. Among the most promising are virtual and digital cards, the introduction of a simplified digital signature, and the development of open banking. The most competitive participants in the banking services market – fintech companies and virtual banks – have been identified. In addition, special attention is being paid to promising areas of their development through the introduction of digital platforms and ecosystems. Particular attention is paid to the analysis of digital transformation strategies of such large banks as Tinkoff Bank, Sberbank, VTB. The authors of the article emphasize that the pandemic has accelerated the development of the banking industry towards digital banking and the creation of digital platforms, especially financial ecosystems, which are complex platforms designed to serve the financial and non-financial needs of customers. The main reasons for the increased interest from banks in relation to ecosystems are due to competition in the market of traditional banking services, the search for additional sources of income, and diversification through the sale of non-banking services.

Keywords—*digital transformation, digitalization, digital banking, financial ecosystem, COVID-19 pandemic.*

I. INTRODUCTION

The coronavirus pandemic has significantly accelerated the process of digitization, affecting consumer behavior, and changing business processes around the world. The situation in the first half of 2020 – a lockdown regime and the forced transfer of employees to remote work for a large number of organizations – increased the importance of digital interaction between people, businesses and government authorities.

Business responded quickly to the need for social exclusion measures: many office employees have been given the opportunity to work from home. Authorities and local governments have been also actively embedded in the digital

environment – a lot of state and municipal services have been provided electronically. With the help of specialized sites or mobile applications people can buy almost any goods, get training, have an interesting time (visit the online cinema, museum, library, meet friends and acquaintances in social networks or messengers).

II. METHODS

The research methodology is based on the materials of Russian and foreign economists on the problem under study. The study of the selected topic is based on the methods of generalization and comparison, analysis and synthesis, the method of groupings, as well as the models of banking management applied in practice by modern Russian banks.

III. DISCUSSION AND RESULTS

In essence, digital transformation is a profound modification of economic and organizational activities, business processes, competencies and business models that take full advantage of the changes and opportunities of digital combinations and their increasing impact on society in a strategic and priority manner, taking into account current and future changes.

The development and use of digital platforms based on innovative digital technologies has become the main direction of development of the digital economy. The modern technology platform is based on four key information and communication technologies - mobile communications, social networks, Big Data and Cloud Computing technologies - and is complemented by innovative accelerators - robotics, cognitive systems (“Artificial Intelligence”), Internet of Things, 3D printing, Next Generation Security solutions and Advanced and Virtual Reality technologies [11]. All this together significantly expands the scope for innovation and transforms all sectors of the economy, including the banking sector.

In banking, the concept of “digitization” can be defined as the introduction and strengthening of the use of digital technologies by banks in order to create a new digital business model and provide opportunities for generating new sources of income and creating value. This is the transition to digital banking.

The main advantages of digital banking are: new, improved user experience for the client; and an efficient and effective operating model for the bank. The new user experience of the client implies providing new opportunities for the client to interact with the bank via digital communication channels; a huge choice of customized products and services at affordable prices; transparent pricing and the possibility of comparative analysis with competing banks; prompt processing of requests and security of banking operations; instant service at a high quality level [5].

The transition to digital banking is accompanied by profound and far-reaching changes in the fundamentals of the bank itself and in all its activities. Digital transformation means a total transformation of the economic and organizational activities of the bank, its processes, competencies, models based on the fullest use of the possibilities of innovative digital technologies in order to provide the bank's customers with an improved user experience and meet their individual needs. The use of remote banking channels in Russia in 2020 is presented in Fig. 1. [8].

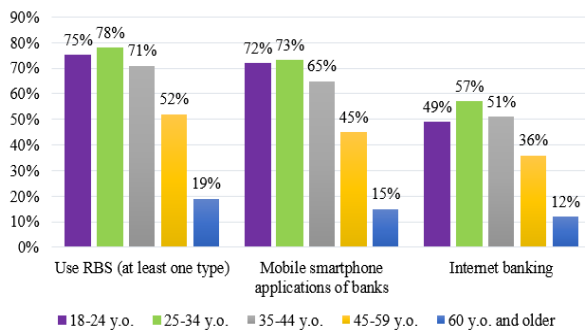


Fig. 1. Use of remote banking service (RBS) channels in Russia in 2020, distribution by age

Analyzing the dynamics of the number of users in Fig. 1., it is possible to conclude the most active users of digital banking services are young Russians of 18-24 years old: 75% use either banks' mobile applications or Internet banking, and mobile banking in this age group is much more popular than Internet banking (72% vs. 49%). For older Russians, this gap is smaller. Thus, at the age of 45-59, 45% use mobile applications, 36% use Internet banking, i.e. the older a person is, the less often they use digital financial management channels.

With the help of mobile smartphone applications of banks, it is possible to manage cards, accounts, order bank statements and other financial services. Nowadays, 51% of Russians use mobile banking apps, and the share of users has grown significantly over the past few years (26% in 2018).

Internet Banking is a website where a bank customer can manage their accounts and use financial services. Internet banking services are less in demand than banks' mobile applications: 37% versus 51%. In 2018, the share of Internet banking users was 16% of Russians.

The introduction of digital products and the use of platforms based on innovative banking technologies and the formation of financial ecosystems capable of uniting people, resources and information and thus creating new ways of consuming goods and services are becoming a key area of development for the modern financial market [12].

Lockdown regime during COVID-19 pandemic has forced many services to become online. We can note the increase in the number of virtual and digital cards, the introduction of simplified digital signature, the development of open banking.

A digital card is an independent fully functional product that retains all the capabilities of a bank card in the absence of a plastic carrier. Unlike a virtual card, a person can add it to Apple Pay, Google Pay and other wallets, make payments online and offline, make and receive transfers. In the context of the pandemic, the demand for digital maps has increased. Such growth has been recorded by many large banks, including Sberbank, VTB, Russian Standard Bank, QIWI. Table 1 presents a comparative characteristic of the most popular digital cards in Russia [9, 10, 14].

Thus, after analyzing the data provided in Table 1, a number of advantages of digital cards of the considered commercial banks can be highlighted, in particular, the absence of payment for issuance and maintenance, as well as speed and convenience: cards are issued remotely via the Internet bank or a mobile application within a few minutes. It is also important to note that, unlike Russian Standard and VTB, there is no loyalty program for digital cards from Sberbank.

However, with all the undeniable advantages, digital cards have several disadvantages. The main one is the strict technical requirements for the payment infrastructure:

- without a smartphone with an NFC (Near field communication) module, the card cannot be used to pay in ordinary stores and to withdraw cash from it. In this case, the card can only be used to pay for purchases in the online space;
- even if a person's phone is equipped with NFC, not all terminals and ATMs are equipped with an NFC reader, which allows a person to make payments and withdraw cash without a card.

Another feature of digital cards is that only active bank customers can open them. To issue a card, a person needs access to their personal account. This limitation is connected the requirement for mandatory identification of the client to open an account.

One more necessary online service is the confirmation of transactions using a simplified electronic signature, which is stored in a smartphone. It will replace the use of one-time codes from SMS or push notifications. The new method works by analogy with the electronic signature that is stored in a smartphone: the client is sent a notification about a money transfer or payment in an online store, after clicking the "confirm" button, a signature is generated, controlling authorship and continuity of the operation. It can only be installed on a specific smartphone owned by a client.

Moscow Credit Bank has already introduced such technology for mass use. Sberbank's immediate plans include launching new products new products that allow to dispense with the verification codes in SMS. Zenit Bank has reported they are considering the introduction of such technology. The ability to confirm transactions without a code from SMS has already been implemented for Otkritie Bank's VIP clients. A similar technology is used at VTB. It is valid only for money transfers, but not for payments in online stores. Smart-logic is already used by Tinkoff Bank to confirm payments.

TABLE I. COMPARATIVE CHARACTERISTIC OF THE MOST POPULAR DIGITAL CARDS IN RUSSIA

The name of the digital card and the issuing bank	Main characteristics	Terms of service
Visa Digital (Sberbank)	<ul style="list-style-type: none"> - Opening via the Internet bank or the Sberbank Online mobile application (if a person has an active debit card connected to the Mobile Bank service) - Issue fee: no - Payment system: Visa - Currency: rubles - Validity: 3 years - Service fee: no - Ability to withdraw cash: through ATMs - no, through the cashier - yes (commission 0.5-0.75%) 	<ul style="list-style-type: none"> Transfer limits: up to 1 million rubles per day can be transferred from the card through Sberbank Online. For a transfer by card number to another bank, a commission of 1.5% of the amount is charged, at least 30 rubles Transfers through the Faster Payments System: free up to 100 thousand rubles per month, then the commission will be 0.5%, maximum 1,500 rubles Loyalty program: "Spasibo from Sberbank" for digital cards is not provided
Digital Multicard (VTB)	<ul style="list-style-type: none"> - Opening via the Internet bank or the VTB-Online mobile application (if a person has a card opened within the "Multicard" package) - Issue fee: no - Payment system: Visa, MasterCard - Currency: rubles, US dollars, euros - Ability to withdraw cash: via ATMs equipped with NFC - yes 	<ul style="list-style-type: none"> Operations (transactions) limits: for 1 operation - 100,000 rubles; for operations per month - 300,000 rubles. Transfers through the Faster Payments System: free of charge up to 100,000 rubles, then the commission will be 0.5% of the transaction amount, minimum 20 rubles, maximum 1,500 rubles Loyalty program: "Multicard", within which the cardholder can choose one of the options: cashback for any purchases (1.5%), "Cash Back and auto" (up to 4%) and "Cash Back and restaurants" (up to 4%), "Collection" (up to 3%), "Travel" (up to 3%), "Savings" (up to +1.5% to the rate on the account or deposit) and "Borrower" (up to -10% to the rate on loan agreement)
Bank in Your Pocket Digital (Russian Standard Bank)	<ul style="list-style-type: none"> - Opening via Internet bank or mobile application - Issue fee: no - Payment system: MasterCard - Currency: rubles - Service Fee: No - Ability to withdraw cash and top up an account: via ATMs equipped with NFC - yes 	<ul style="list-style-type: none"> Transfer limits: the maximum amount of one money transfer is 50,000 rubles; maximum amount of money transfers (per month) 600,000 rubles. Transfers through the Faster Payments System: free Loyalty program: 15% cashback for purchases

Representatives of credit institutions note that a document signed with the help of a new solution cannot be substituted or accessed by third parties. The signature key is located directly in the smartphone and cannot be reproduced on another device. The technology for confirming transactions without a code in SMS will be effective in combating SIM card substitution schemes and attempts to enter an online bank from someone else's device – the signature for confirmation is stored on another smartphone, so the fraudster will not be able to conduct a transaction.

According to experts, the key advantage of the new method of confirming operations over the classic one is

protection against interception of a message with sensitive information by an attacker. However, the risks of loss or theft of the device should not be forgotten. To enter the mobile bank, where the transaction is confirmed, it is necessary to set long, complex passwords that will not allow a fraudster to gain access to data in a short time [2].

Open banking is a tool for fast and secure data transfer between different companies. In the financial market, it is used primarily for banks to open access to their data and services to third-party companies. Currently, the Bank of Russia has begun to implement open banking technology: at the first stage, banks will exchange information on accounts of legal entities in a test mode using the technology of open program interfaces (Open API). This should make it easier for companies to obtain loans. The exchange can then be extended to individuals. The pilot version of the service was launched at the basis of the FinTech Association, created by the Central Bank of the Russian Federation. As of September 2020, there are 13 banks participating. This is the first service launched as part of testing the Open API technology, a Bank of Russia project aimed at digitalizing financial services and increasing competition in the financial market [3].

As for the strategic directions of development of banks themselves, their activities were changing rapidly, due to the use of the latest digital technologies. Some regions of the world have already identified leading digital transformation banks that have achieved significant success in a short time and are actively developing the global banking industry at the regional level.

The world's leading position in the field of digital banking is currently occupied by the Chinese Ping An Bank, which was named "The Best Global Digital Bank 2020" by Euromoney magazine [15].

The innovative development of the economy of the Russian Federation contributes to the successful promotion of digital banking in the Russian market, led by Sberbank and Tinkoff Bank. Sberbank retail digital bank was ranked as the best bank in Central and Eastern Europe in the categories "Best Bill Payment & Presentment" and "Best Information Security and Fraud Management" by Global Finance magazine in 2019 [16]. Tinkoff Bank is considered the largest neobank in Russia. In 2020, it headed the Internet Banking Efficiency Ratings for private clients of Markswebb Analytic Agency, including the "Internet Banking rating for daily tasks" and the "Internet Banking rating for the level of the digital office" [7].

However, not all banks consider the complete transition "to a digit" to be optimal. Traditional banks are also forced to transform their business processes, but the format of paperless offices is generally preferred, as human communication can become more sought after a pandemic.

Alfa-Bank, the largest private bank in Russia, offers a different format of functioning: phygital offices (physical+digital), which contains a combination of digital and physical channels.

In the mobile application, client can see the workload of the department and select the preferred time for a visit. Using facial biometrics and smartphone geolocation, the bank will recognize customer at the entrance to the office, and its employees will be able to understand in advance what service can be offered to them. Face recognition accuracy is 98% [1].

The information obtained will be displayed on the tablet or in the computer of the employee who will see the client's profile and the services suitable for them. It will be possible to confirm transactions using biometrics without submitting documents. All documents will be signed and stored on the smartphone. Each office will save up to 10 tons of paper per year. The interior of the phigital office resembles a coworking space, there are no staff counters and no separate work area; employees and clients can choose any place convenient for work in the office space and comfortably resolve all issues.

In the autumn of 2020, Alfa-Bank will begin a gradual transformation of its entire network of branches, which, as of August 2020, has 525 offices in Moscow and the regions of Russia. Alfa-Bank plans to introduce phigital-format in 100% of its branches within 3-5 years.

VTB Bank plans to implement a similar branch format in the near future. It will be possible to sign up to the bank through a chat bot in WhatsApp, and the employees will prepare the necessary documents for the client's visit. The bank will identify clients by the MAC address of the phone and send them directions to the desired table or meeting room via WhatsApp. To use identification by smartphone, the client must go through the initial registration at the office, during which the user's phone remembers VTB's Wi-Fi as a home network. When a client visits again, his phone is automatically connected to VTB's network. The visitor receives a notification about the service menu in the department. If the client comes by appointment, the system will automatically activate the recording. Visitors choose the required service on their phone and receive electronic coupons. After that, the system prompts the client what he needs to do.

Up to 80% of standard actions on loans, deposits, payments and transfers can be independently carried out by the client via VTB-Online, up to 95% of all cash transactions – via ATMs. When a client requires a more sophisticated service, for example, a mortgage or car loan, they will be able to receive video consultation and make an application even if the office does not specialize in these products.

There will be no fixed workplaces in the retail service area of the new offices: the bank's specialist will suggest the client to choose a convenient place. Automatic parameter control (Smart-office) technology will be applied in the branches, allowing optimization of temperature, humidity, illumination and concentration of carbon dioxide in the office. This will reduce by 10% both the emissions and the cost of maintaining 1 square meter space compared to the standard office. The use of paper is being significantly reduced. Currently 40% of all

documents in the office are processed electronically using the technology of paperless service. Only the refusal of coupons through the use of the WhatsApp chat bot will allow to spend 2.63 cubic meters of paper per year less.

According to VTB forecasts, the average waiting time in the office will decrease by 33%, and the office efficiency will increase by 40% [13]. By the end of 2020, similar offices will appear in Moscow and in five other regions. From 2021, all VTB Bank offices will be opened in a new format.

All of these achievements of Russian banks demonstrate the importance of continuous innovation in banking products, systems and services that are driving the global banking industry digitally. Customers are looking forward to new solutions that will transform their lives and businesses, and the leading banks in digital banking are constantly striving to meet these expectations.

Another point requiring attention is that the pandemic has increased the impact of financial ecosystems on the economy. Ecosystems are complex platforms where different services, goods, services are combined for the convenience of the consumer [4]. Such systems are currently being built on the basis of large banks such as Sberbank, Tinkoff Bank, Alfa-Bank, VTB, Russian Agricultural Bank, Post Bank and others on a smaller scale. This is not only about loans and online transfers, selling insurance policies and opening deposits. Ecosystems are increasing their presence in all segments, not only to the share of financial markets. They succeed in selling other related services, sometimes far removed from the financial sphere. Financial-digital ecosystems gradually begin to "spread" to all markets. Any service where payment is made falls within the scope of ecosystem interests: booking cinema or plane tickets, buying gifts, food delivery.

The reasons for such an increased interest of banks in expanding ecosystems through non-banking services are quite understandable. Firstly, competition in the traditional banking market is intensifying. Secondly, banks are looking for additional sources of income, which can be diversified by selling non-banking services. Third, ecosystems create powerful barriers to market entry. New entrants must not only improve the main product, but also compete with existing systems of complementary services. In addition to banks, large technology companies like Yandex, Mail.ru Group, mobile operators such as MTS, Megafon are currently working on the development of ecosystems. Table 2 shows a map of the largest Russian ecosystems [6].

TABLE II. COMPARISON OF SERVICES PROVIDED WITHIN THE LARGEST RUSSIAN ECOSYSTEMS

Services provided	Service name				
	<i>Sberbank</i>	<i>Tinkoff</i>	<i>Yandex</i>	<i>Mail.ru</i>	<i>MTS</i>
Finance	Sberbank Online, Sberbank.Investor, SberCredo, Yandex.Money	Tinkoff Investment	Yandex.Money, BCS Investment, Yammi	Money@ Mail.ru, VK Pay	MTS Money, MTS Investment, MTS Bank
Purchases	SberLogistics Yandex.Market Supercheck Beru	Tinkoff SuperApp	Edadil, Yandex.Market, Supercheck, Beru	Youla Pandao	
Media and entertainment	Rambler / Cashier, Afisha, LiveJournal, Lenta.ru, Gazeta.ru, RNS, Secret Firmy, Championat.com, Okko	Tinkoff SuperApp	KinoPoisk, Ya.Streamer, Yandex.Afisha, Yandex.Video, Yandex.Zen, Yandex.Music, Yandex.News, Yandex.Radio, Yandex.Efir	Media projects@Mail.ru, Boom, My.Games	MTS Afisha, MTS Games, MTS Media, MTS TV, MTS Music, WASD.tv

Services provided	Service name				
	Sberbank	Tinkoff	Yandex	Mail.ru	MTS
Communications	SberMobile	Tinkoff Mobile	Aura, Yandex.Mail, Sloy	VK.com, My World@Mail.Ru, ICQ, TamTam, Mail@Mail.ru, Odnoklassniki	My MTS, MTS Mobile
Home	DomClick		Smart home: light bulb, remote control, socket; Yandex.Module; Yandex.Station Yandex.Realty	Realty@Mail.ru	MTS Intercom, VDome
Education		Tinkoff Education	Yandex.Practicum, Yandex.Tutor	GeekBrains Skillbox	Smart University
Job	Rabota.ru		Yandex.Jobs + Services + Talents		YouDo
Health	DocDoc	Tinkoff SuperApp	Yandex.Health	Vseapteki.ru, Health@Mail.ru	SmartMed 120/80
Food	SberFood, Delivery Club, SberMarket	Tinkoff SuperApp	Yandex.Lavka, Yandex.Eda	SberFood, Delivery Club, SberMarket	
Children	Sber Kids	Tinkoff Junior			MTS Razvivajka
Travel	Spasibo from Sberbank.Travel	Tinkoff Travel, Tinkoff SuperApp	Yandex.Travel		
Car	Sber.Auto, Cetelem	Tinkoff of gas station, Tinkoff SuperApp	Yandex.Auto, Auto.ru		
Mobility	Citymobil, Youdrive		Yandex.Taxi, Yandex.Drive, Uber Russia	Citymobil, Youdrive	
Search and maps			Yandex, Yandex.Search, Yandex.Maps	Search@Mail.ru Maps.me	
Technology	Sberbank ID	Oleg	Alice, Yandex.Disk, Yandex.Passport, Yandex.Phone	Marusia, Cloud@Mail.ru, Mail ID	MTS 2memory
Loyalty program	Spasibo from Sberbank	Cashback	Yandex.Plus	Combo	MTS Cashback

Based on the data in the Table 2, it can be concluded that Yandex, Tinkoff, Sberbank are leading in the amount of financial and non-financial services provided. At this stage, MTS has not yet sufficiently revealed its potential and has not developed a comprehensive ecosystem. It is also important to note that all the ecosystems considered (built by both banks and non-bank companies) are actively developing financial services.

Thus, the landscape of the banking services industry is changing dramatically. The boundaries between various industries (both financial and non-financial) are being blurred due to a shift in focus from products towards to customers and their needs. While previously users were looking for specialized financial products, now platform solutions that combine different financial instruments will be in demand. Moreover, it is not important for the client who will be the supplier of such solutions: a bank or a fintech company.

IV. CONCLUSIONS

Having studied the main products and services of commercial banks in the context of digital transformation, it should be noted that innovative digital technologies have provided a variety of opportunities for the development of the banking industry towards digital banking and the creation of platforms and ecosystems to serve the financial and non-financial needs of customers. The activities of banks in the digital age go beyond traditional banking services, everything will be done for the sake of the client and to meet their financial needs, as well as to support their lifestyle. Digital transformation will enable banks to stay in line with trends and be able to compete in a new environment where active market

participants have emerged and offer consumers more innovative financial solutions. Leaders in the banking services market will largely depend on the success of the implementation of the strategy that banks will choose for their further development.

It can be expected that, in particular, due to the consequences of the COVID-19 pandemic, more transactions will soon be carried out through digital channels and the network of bank branches will be optimized, but there will be operations that require physical interaction. It is worth noting that such a phygital model is logical in a context of widespread digitization, but it is difficult to call it a target for banks that that focus on serving the most massive segments. In addition, the creation of such branches requires significant investments in IT technologies, personnel training and infrastructure (which is not available to all banks), and biometrics still carries certain risks for customers, in particular, risks of personal data leakage.

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