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INDUSTRY SPECIFICS OF DIGITAL TRANSFORMATION OF THE FINANCIAL SECTOR

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Abstract

The study delves into the industry-specific aspects of digital transformation within the financial sector, particularly focusing on the concept of open banking and its transformative potential. Through an in-depth analysis, the research aims to elucidate the key features of open banking and its implications for financial institutions. The methodology employed includes comprehensive literature review, analysis of industry reports, and case studies to gather insights into the digital transformation of the financial sector. One remarkable finding of the study is the significant role played by open banking in fostering innovation and customer-centricity within financial institutions. The research concludes that open banking has emerged as a powerful driver of change, enabling financial organizations to leverage technology to enhance customer experience and develop new business models. In summary, the study sheds light on the pivotal role of open banking in the digital transformation of the financial sector, highlighting its potential to revolutionize traditional banking models and enhance customer engagement. Through an extensive review of literature and industry reports, the research provides valuable insights into the implications of open banking for financial institutions, emphasizing the importance of embracing digital innovation to remain competitive in today's rapidly evolving landscape.

Keywords: Digital platforms, digital ecosystem, financial organization, financial sector, open banking

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1. Introduction

The “bank as a service” (Bank-as-a-Service, BaaS) model has absorbed the main elements of the concept of open banking and involves deep integration of the business of the client company and the financial institution. Within the framework of BaaS, the bank actually leases its infrastructure (license, payment processing, card issuance, compliance) to the client (legal entity). This makes it possible, for example, to integrate the bank's financial services into the client's business processes, including external end-user applications and an enterprise resource planning (ERP) system. At the same time, the number and speed of financial transactions significantly increase. BaaS provides an almost seamless connection between company and bank information systems using open APIs, and in some cases smart contracts and distributed ledger technology. All necessary data is transmitted via standard secure protocols in real time. Management is carried out through a separate application that “supervises” a specific area of activity - trade finance, cash management, cash collection, factoring, etc. Along with platform solutions, a variety of digital technologies are widely used in financial organizations, radically restructuring the business processes of these organizations. One of the basic technical solutions most significant for the digital transformation of the financial sector is the technology for remote authentication of individual clients during financial transactions. It is based on the use of customers' biometric data (individual fingerprint parameters, face profile) when making mobile payments. Many organizations are moving from hybrid to fully automated models for managing key indicators and tools that use not only financial, but also any available types of information about assets and the environment, including social and natural phenomena, etc. Metasubject models are being developed that take into account multifactorial data sets (Big Data), including aggregation and processing of incoming data 24/7 (Ovchinnikova & Lavnov, 2019). Many organizations are moving to legally significant electronic document management. Intensive development of services-assistants for financial solutions (robo-advising) ensures the acceleration of the influx of new clients, individuals, into the financial markets. However, the digital transformation of the financial sector is far from being limited to the introduction of advanced digital technologies in traditional financial institutions (banks, investment companies, etc.) and the related changes in their relationship with customers.

2. Problem Statement

In the evolving landscape of the financial sector, the integration of traditional credit institutions with fintech companies has become a prominent trend. While competition exists, there is a growing trend of collaboration, enabling credit institutions to reap the benefits of a broader financial ecosystem. These advantages include the swift, cost-effective, and targeted provision of fundamental financial products, alongside the utilization of innovative marketing channels for customer acquisition. Notably, this collaboration provides banks with valuable insights into consumer behavior data, facilitating the creation of personalized products and services. Moreover, it contributes to enhancing financial inclusion by reaching consumers previously deemed risky due to limited information. Key to this transformation are aggregators of user information, such as telecom operators and social networks, emerging as pivotal participants in banking platforms.

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These aggregators offer access to customer data, empowering banks, including major domestic ones like PJSC Sberbank, JSC Alfa-Bank, and JSC Tinkoff Bank, to refine their scoring systems and tailor loan products. Simultaneously, aggregators are diversifying their service portfolios and expanding user reach, as evidenced by their active involvement in the digital transformation of the financial sector (Makarova, 2021). The current landscape is steering major industry players towards consortiums for the development and implementation of digital technologies, often entailing substantial investments. This collaborative approach is anticipated to significantly diminish transaction costs for all stakeholders, reinforcing the ongoing digital transformation of the financial sector.

3. Research Questions

In the context of the rapidly evolving financial sector and the emergence of cryptocurrencies, several pivotal questions arise, shaping the research focus. Firstly, the study delves into the transformative impact of cryptocurrencies, particularly those harnessing distributed ledger technology, on the financial landscape. It aims to dissect the intricate mechanisms underpinning these fully automated decentralized payment systems, scrutinizing elements such as issuance, accounting, transaction generation, and execution.

Secondly, the research navigates the delicate balance between anonymity and transparency inherent in cryptocurrency transactions. The inquiry extends to evaluating the implications of publicizing transaction details without encryption while concurrently ensuring the complete anonymization of participant identities. This nuanced exploration seeks to shed light on the security and privacy considerations inherent in cryptocurrency transactions.

Moving forward, the investigation shifts its focus to Central Bank Digital Currencies (CBDCs) and their role in the contemporary financial paradigm. It seeks to unravel the considerations and prospects guiding central banks, with a specific emphasis on Russia, in their contemplation of issuing digital currencies. The research probes into the multifaceted functions of CBDCs, dissecting their potential as payment methods, measures of value, and tools for savings, effectively bridging the realms of cash and non-cash money.

Simultaneously, the study examines the dynamic landscape of stablecoins, a noteworthy development within the cryptocurrency domain. By scrutinizing these cryptocurrencies pegged to national currencies or tangible assets, the research endeavors to unravel their role in mitigating the volatility challenges pervasive in other cryptocurrency markets.

Lastly, the investigation explores the broader implications of these digital currency advancements in stimulating further innovation within payment systems. It aims to discern the incentives and catalyzing effects these innovations exert on the financial sector, offering a comprehensive understanding of the trajectory of future financial transactions, encompassing both online and offline realms.

Through these interconnected research questions, the study aspires to provide nuanced insights into the multifaceted impact of digital currencies, unraveling their intricate dynamics and forecasting their role in fostering innovation within the continually evolving financial sector.

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4. Research Methods

The research adopts a multifaceted approach to unravel the intricate dynamics of digital transformation within the financial sector, with a specific focus on open banking and its far-reaching implications. A comprehensive examination of these phenomena necessitates a blend of qualitative and quantitative research methods, ensuring a holistic understanding of the evolving landscape.

To delve into the practical implications and expectations surrounding open banking, a survey methodology is employed, involving 660 companies of varying sizes from 11 countries. This inclusive approach aims to capture diverse perspectives and expectations, providing valuable insights into how businesses perceive open banking. The survey investigates key aspects such as the anticipation of more convenient services, expansion of customer bases, streamlining corporate processes, and the potential reduction in communication complexity and costs when engaging with banks. This quantitative method enables the research to derive statistical trends and patterns, offering a quantitative foundation for analyzing business expectations in the context of open banking.

Furthermore, the study incorporates qualitative methods, including in-depth interviews and case studies, to explore the intricate changes in payment transactions facilitated by open banking. By scrutinizing real-world scenarios and engaging with stakeholders, the research aims to uncover the nuances of payment transactions, such as the initiation of transactions by merchants or financial intermediaries directly from customer bank accounts via the bank's API. Qualitative methods allow for a deeper understanding of the complexities and potential disruptions in traditional payment schemes, offering valuable insights into the implications for various stakeholders, including sellers, banks, and payment systems.

The research also delves into the transformative impact of the Banking as a Service (BaaS) model, employing a combination of case studies and interviews with corporate clients of banks. This qualitative approach enables an in-depth exploration of how clients leverage API services to customize banking services, reduce operational costs, and integrate electronic document management. The study aims to unearth the intricacies of intracorporate settlement management and unified treasury control, shedding light on the advantages and challenges associated with building customized platforms for managing business processes.

To comprehend the shift towards fully automated models and the integration of Big Data technologies, the research employs a quantitative analysis of key indicators and tools. This involves leveraging machine learning technologies for scoring customer solvency and personalizing offers. By embracing quantitative methods, the research strives to uncover patterns and correlations within vast datasets, enhancing the validity of decisions derived from real-time analysis.

In essence, the research adopts a balanced methodological framework that synergizes quantitative and qualitative methods to unravel the multifaceted dimensions of digital transformation in the financial sector, with a particular emphasis on open banking, BaaS, and the integration of advanced technologies like Big Data and machine learning.

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4.1. Financial Services Market O-of Large Technology Companies

Entering the financial services market of large technology companies (Apple, Google, PayPal Holdings, Samsung, Yandex, etc.), actively promoting their own solutions in the market of mobile payments, e-commerce and payment systems (Apple-pay, Samsung-pay, YuMoney etc.), has led to the fact that payment services, relying on remote client authentication technologies, have been integrated into almost all mobile devices, increasing the convenience, speed and security of transactions in the online sales sector. In turn, this encourages merchants to offer their goods and services through mobile platforms. Telecommunication providers, retail stores of any kind are gradually launching their own mobile applications, through which customers can shop online. The rapid growth in the popularity of cryptocurrencies is due to some of their advantages compared to other means of payment, including the outstripping growth in the investment attractiveness of crypto assets, the anonymity of payment participants. In addition, settlements in cryptocurrencies are not carried out centrally by financial institutions, but within the framework of distributed ledger systems, which makes it possible to carry out transactions almost instantly, bypassing intermediaries. Also, cryptocurrencies are becoming one of the key tools of alternative banking (Seifert & Gams, 2011). Companies around the world who, for one reason or another, cannot open a bank account, use cryptocurrencies as a “substitute” for settlement banking. In the future, subject to the development of regulation, the spread of digital currencies will increase the speed and security of electronic payments and transfers, as well as reduce their cost. Crowdfunding platforms have had a catalytic effect on the development of the investment sector, significantly expanding the opportunities for attracting funding to start-ups, small businesses and private projects. RegTech technologies allow financial institutions to optimize compliance with regulatory reporting requirements, optimize customer identification procedures, improve the quality of transaction analysis, ensure risk control and counter cyber threats. SupTech technologies make it possible to digitize and optimize administrative procedures, tools for interaction between the regulator and financial market participants, as well as improve the quality of reporting information and improve the decision support system in the field of financial sector regulation. According to some estimates, in recent years, the digitalization of banking processes has already reduced the costs of banks by 10–15.

Today, digital transformation covers the full range of products and services of the financial sector, as well as key business processes: from communications with end users to storage and processing of data arrays, from decision-making procedures to channels for offering and servicing products and services. The largest financial institutions are intensively mastering advanced technologies. In particular, a number of leading banks, including Nationwide, HSBC (Hongkong and Shanghai Banking Corporation), RBS (Royal Bank of Scotland) and others, have switched to open APIs and use them in their digital ecosystems, which allows them to open new high-yield segments market, going beyond the financial services sector (Darsih et al., 2015; Kaishev, 2013).Such ecosystems have a horizontal structure - partnerships are built between banks, fintech companies and non-financial businesses. Due to such changes in business models, banks are becoming a key sales channel not only for banking, but also for other financial products - insurance, brokerage, trust management, etc. At the same time, the lack of funds for the development and implementation of complex IT solutions in small and medium-sized banks

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causes their interest in accessing the platforms of the big players. As a consequence, the largest banks involve the smaller ones in their ecosystems.

4.2. Growing E-commerce Business

Many foreign credit institutions integrate services into their ecosystems using the BaaS13 model. For example, Berlin-based Solarisbank offers its customers all over Europe a fully digital BaaS platform. The modular structure allows you to selectively integrate any of the available services — bank accounts, transactions, payment cards (Vorontsova et al., 2019). There are many such examples. The global mobile payment market is growing rapidly, estimated at $1.48 trillion in 2019 and projected to reach $12.06 trillion by 2027, growing at an average annual rate of 30.1% since 2020 to 2027 (Klishina et al., 2017; Vorontsova et al., 2019) Growth in the number of smartphone users and a growing e-commerce business have been key drivers of this development. The use of NFC (Near Field Communication) technologies, SMS-based transaction payments and direct mobile billing have proven to be in high demand during the COVID-19 outbreak. High demand for contactless payments in retail stores has led to historically the highest mobile payment market share in the retail segment, as the use of this technology reduces the likelihood of transmission of the virus. The past year was marked by another round of increasing market value and the spread of cryptocurrencies. As of March 2021, there were approximately 4,800 cryptocurrencies worldwide with a total market capitalization of $1.9 trillion, up 6x from $326 billion in March 2020 (Taranova et al., 2021). Against the backdrop of a decrease in cash turnover in the context of the COVID-19 pandemic, the number of commercial payments using cryptocurrency has grown significantly (Shmatko et al., 2016). The largest companies in various sectors of the economy have implemented systems that use digital currencies as a form of payment. Among them are Microsoft Corporation, Visa Inc., AT&T Inc., BMW AG, Tesla, etc. One of the domestic examples is the Global Palladium Fund, established by Norilsk Nickel, and has issued its own digital tokens on the Atomyze platform for settlements with counterparties (Podkolzina, Belousov, et al., 2021). One of the cryptocurrencies actively used in retail is Dash. In Q1 2020, active Dash wallets on mobile grew to 102,000 (up 214% year on year). The key region for the outstripping distribution of such use of cryptocurrencies is Latin America. For example, Burger King in Venezuela has started a partnership with the Cryptobuyer processing service, allowing its visitors to pay with cryptocurrencies (Podkolzina, Taranova, et al., 2021). In Brazil, more than 2.5 million online stores using the Atar Pay solution have the ability to accept cryptocurrency (Elbuzdukaeva et al., 2019). Today, the central banks of more than 70 countries of the world, including Russia, are considering the prospects for issuing their own digital currencies. Pilot projects are being implemented in six countries, including China, South Korea and Sweden. In three countries - Uruguay, Ukraine and Ecuador - testing of the national digital currency has been completed. At the same time, the Bank for International Settlements, together with seven central banks, including the US Federal Reserve, the European Central Bank and the Bank of England, published key requirements for such a digital currency (Podkolzina, Belousov, et al., 2021). Positive dynamics is also noted in the stablecoin segment. One example of the growing interest in such cryptocurrencies is the Libra universal stablecoin project, which was introduced in 2019 by Facebook, Inc. It is noteworthy that access to this digital currency can be obtained by all users of the social network, the audience of which is

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approaching 3 billion people around the world. The market use of stablecoins is also expanding. For example, Walmart has been exploring the possibility of launching its own stablecoin since 2019 and introducing it as one of the main payment methods in the coming years. This solution will bypass the 2–3% transaction fees charged by financial institutions for processing traditional non-cash and card payments (Klishina et al., 2017). Another example is the Japanese shipping company Nippon Yusen Kaisha, which has announced plans to convert its employees' salaries into USD-pegged stablecoins. This measure will allow employees of the company - citizens of different countries, working alternately in different parts of the world - to facilitate the management of their finances, as well as reduce the cost of money transfers and currency exchange, avoiding high commissions.

5. Findings

The research reveals significant developments in the financial sector, particularly in the realm of decentralized finance (DeFi), characterized by the utilization of blockchain technologies and smart contracts. The emergence of DeFi protocols such as Compound, Balancer, and Curve has propelled the sector's growth, reaching a staggering volume of $4 billion by the summer of 2020. This surge in DeFi offers users and investors unprecedented opportunities, including the integration of DeFi with existing services through universal protocols, and the creation of electronic smart wallets facilitating seamless payment and replenishment operations across multiple payment systems and services, often with minimal or no commissions.

Crowdfunding has also witnessed remarkable growth, evolving into a significant source of funding for businesses and social initiatives alike. In the UK, crowdfunding platforms accounted for 15% of total new small business loans by 2017, a substantial increase from less than 1% in 2012. Similarly, in the US, crowdfunding platforms tripled lending to individuals, reaching $21.1 billion in 2016 compared to $7.6 billion in 2014. Notably, crowdfunding platforms have expanded beyond business lending, finding applications in the social sphere as well.

An illustrative example of this expansion is seen in the partnership between the authorities of Los Angeles, Mastercard, Inc., and the non-profit organization Accelerator. Together, they developed a platform solution for collecting and distributing private donations, including those received via text messages, to support the impoverished population. This initiative showcases the potential of collaboration between public and private entities to streamline the distribution of government benefits and funds, as well as accelerate digital currency creation programs (Barzaeva & Ilyasov, 2022; Ilyasov, 2018).

Overall, the findings underscore the transformative impact of DeFi and crowdfunding in reshaping the financial landscape, highlighting the opportunities for innovation and inclusivity in financial services. These developments herald a new era of financial empowerment, where decentralized platforms and collaborative efforts pave the way for greater accessibility and efficiency in financial transactions, benefiting both individuals and society at large.

In the context of the development of digital technologies, in 2015 the European Parliament adopted the PSD-2 directive on the creation of a secure and innovative European payment system, which consolidates the principles of open APIs in the financial market of the European Union, aimed at increasing competition by providing open access to information about user accounts, and also the

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possibility of initiating transactions from these accounts by financial service providers with the consent of the client without concluding special agreements between organizations (Shmatko et al., 2016). This will increase the security of consumers when paying online, will promote the development of online and mobile payments, will use the potential of open banking, as well as make intra-European cross-border payment services more secure. This directive opened up new opportunities for Russian banks to interact with European partners, and also influenced the guidelines for the digital development of the domestic market. The Russian financial sector is one of the leaders in digital transformation. According to the results of 2019, the Digitalization Index14 of the domestic financial sector reached a value of 34 and was second only to industry (with an indicator of 36). At the same time, the financial sector is the absolute leader in terms of such an indicator in the index as the share of organizations using broadband Internet and cloud services. Moreover, at the end of 2019, the internal costs of organizations in the financial sector for the creation, distribution and use of digital technologies and related products and services amounted to 380.2 billion rubles, which corresponds to 8.9% of the gross value added of the sector, leaving these the most important indicators far behind all other sectors of the economy and the social sphere. The high demand for digital technologies in the financial sector stimulates the development of fintech. In 2020, the volume of investments in startups in this area only from venture funds amounted to 21.9 billion rubles. (Podkolzina, Belousov, et al., 2021), and the total volume of the Russian fintech market in 2020, according to some estimates, reached USD 940 million (Podkolzina, Taranova, et al., 2021). This allowed our country to enter the top three countries with the highest level of fintech penetration — 82% of Russian citizens use various fintech services. In Russia, companies in the financial sector are actively building their own digital ecosystems. Sberbank PJSC was one of the pioneers in this area, having spent about USD 1 billion, or 3% of its profit, on the purchase of relevant assets in the period from 2016 to 2019 (Elbuzdukaeva et al., 2019). At this stage, the Sber ecosystem includes several dozen companies in various fields of activity. Among them are the Domclick mortgage portal, the SberMobile virtual telecom operator, the Beru! online marketplace, the Okko online cinema, the DocDoc online project in the field of medicine, and others. At the end of 2020, the number of retail clients of the ecosystem exceeded 3 million people, and corporate clients — 200 thousand companies (Sugaipova & Gapurov, 2018). Compete in the creation of ecosystems and domestic digital giants. The “perimeter” of Yandex includes the YuMoney payment service, taxi, car sharing and courier delivery services united under the Yandex GO brand, the Yandex.Music platform, the Kinopoisk streaming service and a number of other diversified companies united in a single digital space for registered users . Ecosystems have become an effective launching pad for non-financial companies to enter the market, which was considered the exclusive domain of banks and payment systems. The same YuMoney allowed Yandex not only to occupy a significant market share in the field of electronic payments, but also to become one of the leaders in financial services for the social commerce market, including the sale of goods and services on social networks, instant messengers, ad sites and other P2P platforms. According to Yandex.Checkout, such a market in Russia in 2018 was estimated at 591 billion rubles. with a turnover of 394 million transactions, and its participants were 39 million buyers and 22 million sellers - companies and individuals (Podkolzina, Taranova, et al., 2021). The prospects for the digital transformation of the industry in Russia are also closely related to the introduction of biometric systems, in particular, the state Unified Biometric System (UBS), designed to

provide a wide range of services, expand access for financial organizations to government information resources, develop electronic document management between financial market participants, the regulator (Bank of Russia) and end users. As of the beginning of 2021, more than 164 thousand people and 231 banks were registered in the system, which together have a network of 13.3 thousand branches throughout the country, which suggests a further rapid growth in the number of customers (Elbuzdukaeva et al., 2019).

6. Conclusion

The convergence of the aforementioned trends, exacerbated by the challenges posed by the COVID-19 pandemic, sets the stage for a profound and dynamic digital transformation in the Russian financial sector in the coming years. Projections indicate that the financial sector will continue to be at the forefront of digital technology demand within the domestic economy. However, the trajectory of this transformation hinges significantly on strategic decisions made in the near future.

Crucial to this evolution is the establishment of effective regulatory frameworks for digital financial assets and digital currencies. Encouragingly, initial steps have been taken in this direction, with the adoption of a fundamental federal law in July 2020. This legislation regulates various aspects, including the issuance, accounting, and circulation of digital financial assets, as well as the circulation of digital currency in the Russian Federation.

Sberbank, a major player in the Russian financial landscape, has notably announced the development of a stablecoin named Sbercoin. Pegged to the Russian ruble and built on the Ethereum blockchain as an ERC-20 standard coin, Sbercoin is positioned to explore the possibilities of conducting legal commercial activities within the Russian legal framework in the cryptocurrency sphere.

While these steps signify progress, the dynamic nature of the digital financial landscape demands concerted efforts to create a conducive regulatory and legal environment. Striking a balance between cautious deliberation and timely adaptation is crucial to prevent "institutional lag" and avoid technological dependence on foreign solutions. Urgent attention to align with international best practices will be instrumental in shaping a resilient and innovative digital financial ecosystem in Russia.

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