

## BANKING INNOVATIONS AND THEIR INFLUENCE ON THE FORMATION OF DIGITAL BANKING

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**Abstract:** The article considers the peculiarities of the influence of banking innovations on the transformation of banking into a digital banking system. Definitely features of digitalization of banking services and models of digital banking. The necessity of involving banking institutions in the intensive introduction of the latest digital technologies in their activities to increase their own competitive position and increase the bank's profitability has been proved. A set of measures to increase the efficiency of digital technology implementation in banking is proposed.

**Keywords:** Banking innovations, Banking operations, Digital banking, Digital banking products, Internet banking.

### 1 Introduction

The modern specificity of the development of the banking products market is to increase the use of innovative technologies in ensuring interaction with customers through various Internet banking systems. However, as you know, one of the most important tasks to improve the efficiency and functioning of banking institutions is the introduction of new banking technologies and various innovations. As practice shows, every year there are rapid changes in the development of society and in the information sphere. All this significantly affects the development of new technologies in the banking system and on their basis – ensuring the competitiveness of each banking institution and ensuring a high level of customer service and providing them with a wide range of services, as well as improving the security of the banking business.

Thus, we can talk about the full transition of the existing online banking systems to a new level of relations with their customers, which takes place on the basis of innovative solutions and software products, which ultimately results in the formation of a new digital banking system. At the same time, its key feature is the integration of the latest digital technologies with the bank as a subject of the financial services market. Such integration is interdependent, as banks can no longer operate in dynamic financial markets using old technologies, and their customers need services tailored to the opportunities that open up to them through innovative solutions in the global digital economy.

Thus, the global transformation of the system of economic relations, which takes place on the basis of digital technologies and leads to the spread of Industry 4.0, is impossible without a similar transformation of banking systems into full-fledged digital banking. At the same time, there is a specific situation when the banking sector currently operates on the basis of advanced technological information solutions and at the same time – needs to adapt its online banking systems to the requirements of the digital economy.

### 2 Literature Review

A lot of theoretical and practical research is devoted to the study of the problems of improving the efficiency of modern online banking systems, as well as the introduction of the latest

innovative solutions in banking in terms of their integration with modern digital technologies. Speaking of the key ones, it is necessary to highlight the work of such researchers as O. Agres [1], O. Apostolyuk [2], I. Bakhov [3-4], N. Bakhmat [5], V. Bayev [6], O. Binert [7], A. Boiar [8], Y. Chaliuk [9], V. Darahan [10] M. Dziamulych [11-14], S. Hanaba [15], N. Karasova [16-17], L. Kartashova [18], O. Klein [19], V. Kornivska [20], O. Kosenchuk [21], O. Kozii [22], O. Krukmal [23], T. Kulinich [24], O. Lagovska [25], L. Lomovskykh [26], W. Meyers [27], Y. Mielkov [28], V. Rysin [29], S. Sheludko [30], T. Shmatkovska [31-33], R. Sodoma [34-36], O. Stashchuk [37-39], Yu. Tkachenko [40], N. Vasylyeva-Khalatnykova [41], O. Vovchak [42], I. Yakoviyk [43], Ya. Yanyshyn [44], O. Yatsenko [45], S. Zeng [46], I. Zhurakovska [47] and others.

At the same time, the dynamic changes taking place in the field of banking under the influence of technological innovations and the rapid spread of innovative digital technologies used in online banking systems require more detailed study of the formation of new specific banking systems based on digital mobile solutions and result in the formation of digital banking systems.

### 3 Materials and Methods

The study of the specifics of the formation of digital banking is based on models that involve the transformation of traditional online banking, which is banking, and general financial transactions that are carried out virtually, without direct contact between the customer and bank employee, i.e. by electronic means. Such operations can be any banking operations and services, and their feature is that they can be carried out at any time and from any place. The main requirement for a banking transaction is the presence of a mobile phone or computer.

Today, innovative for the banking sector of the new generation of banking services, covered by the common name of online banking: Internet banking, mobile banking (t-banking), and telephone banking.

Online banking services are provided to customers of banking institutions in real-time, i.e. instantly and are extremely profitable because they provide a fairly high speed of a large number of banking operations within 24 hours a day from anywhere in the world.

Telephone banking – it is a type of remote banking using telephone communication, which works in tone mode. This bank account management system allows customers of a particular banking institution to receive relevant information by phone about the status of their account, the movement of funds in the specified account, to transfer funds from account to account, as well as make utility payments at any time. It is worth noting that in this case, access to the network does not require a mobile phone, computer, or other means that would provide access to the current account. The client of the banking institution with the help of telephone banking has the opportunity to manage his account either through the operator and by voice or automatically by dialing the appropriate phone number.

At the same time, mobile banking, as it is also called GSM-banking, allow you to manage a bank account using a mobile phone using both a mobile phone and a portable computer system (Personal Digital Assistant) by using the latest wireless access technology. Note that the main advantages of mobile banking are both the implementation of appropriate banking operations and control.

The new generation of Internet banking is a qualitatively new Internet banking, which guarantees complete confidentiality and offers the most modern services in a user-friendly interface and is now widely used in the banking system.

Today, servicing your own bank account using a mobile phone is quite popular in the world in the banking market. The mobile phone turns almost into a computer terminal with the help of a SIM card, which is implanted in it. If necessary, you can download the appropriate banking program to this SIM card, which is easy to manage using the menu that appears on the screen of the mobile phone. The SIM card simultaneously personalizes the user and protects the application by entering a PIN code. In addition, GSM mobile phones have the ability to protect the communication channel through cryptographic means.

#### 4 Results and Discussion

The specificity of the current stage of development of the global system of economic relations is the digital transformation of all business processes, which are largely reoriented to management through cognitive technology and artificial intelligence using a variety of gadgets that are constantly connected to the Internet. Accordingly, the opportunities arising from the introduction of specific innovative technologies in business processes complicate the process of integration of such systems with classic automated management systems – both in the field of enterprise management and in the field of financial services, which includes banking.

However, it should be noted that today there is no clear and unambiguous definition of "digital banking". In essence, digital banking is a new paradigm of interaction between the bank and its customers, a direction that covers innovations in financial services for consumers and commercial customers in the field of digital, information, and technology strategies.

In a simplified form, the evolution of digital banking in terms of penetration into the system of financial activity of customers looks something like this. Initially, there were digital channels for managing bank accounts: Internet banking, mobile banking. The development of digital technologies has allowed us to move to the next stage – a digital product: for example when a bank does not need additional information on paper to obtain a loan but receives it online from a systematic repository of financial information. The highest point of development is the "digital brain", "big data" - a system of interaction between the client and the bank online when all financial information about income, expenses, preferences, unfulfilled financial desires of the client are systematized by appropriate software that not only creates models of financial interaction client-bank, and pushes the client to certain financial decisions, manages his financial behaviour in order to ensure the implementation of all his financial needs [18].

On the one hand, today we feel in our everyday experience how important and extremely necessary part of our lives digital services are: payment cards allow us to perform transactions in the global coordinate system; mobile Internet provides that you can receive and transmit information, communicate, make purchases at any time; The use of Internet banking means that any payments can be made online without leaving home. So today, digital technologies continue to be integrated into the normal operating activities of economic agents.

It should also be noted that digital banking is an important localizer of the customer base, an underestimated source of income (primarily commission), and a way to achieve a competitive advantage in the banking market. Therefore, the management of banking institutions must clearly understand that the quality of digital banking services and ease of use of banking services will gradually displace in the minds of customers such an important criterion today as price. However, there are certain reasons for such radical changes in the banking sector, namely the integration of banks into the digital space. In particular, O. Klein defines in this aspect the following:

- The first reason was the excessive intensification of competition during the global financial crisis. During this period, the banking sector had to bear very strong

competitive pressure, which affected both lending volumes and bank profits and costs incurred by banks;

- The second reason was the need to radically transform the relationship with the customer when banking institutions must remember – the customer first, and because customers have now become very demanding, banks are forced to meet their new expectations and needs [18].

However, we should not forget that digital banking as such is based on banking innovations, which, in turn, are manifested only in the process of its implementation in the financial market or within the bank. At the same time, the demand for an innovative banking product or service determines the degree of its novelty and relevance for the banking institution itself. Thus, increasing the efficiency of banks through the introduction of innovations creates a basis for determining the required period of time, material, and financial, labour, information resources. At the same time, the development of new banking products or services is, first of all, a process of changing the banking strategy, which is part of the bank's innovation policy, because it has a significant impact on the bank's competitive position in the market.

In general, the innovative models of digital banking business include the following:

1. Smart multi-channel bank, which operates using multi-channel integration of digital channels and integrated architecture; focuses on analytics based on the effective collection of customer information, micro segmentation, and predictive modelling to determine a balanced portfolio of banking products.
2. Socially involved bank, which specializes in attracting consumers with special emphasis on social media to strengthen close ties with customers. The key components of this banking business model are social media monitoring to engage consumers and respond quickly to challenges; social digital marketing, built on clustering, as well as social CRM, which enriches customer data with information from social media, helping to create more effective offers.
3. A bank in the form of a financial digital ecosystem that uses the power of mobile technology to offer services that goes beyond traditional banking products. The main elements of this model are mobile payments based on NFC technology, which strengthens the bank's competitiveness in the field of payments and helps retain customers, as well as partnerships with non-banking institutions that promote the creation of joint financial content. [39].

Thus, it can be argued that in general the basis for the formation of innovative models of banking, which lead to its transformation into digital banking, is, above all, the principles of innovative banking strategy, which should include not only the focus on new technologies and digital software. solutions, but must also provide the necessary resource base for such transformations. At the same time, the necessary resources include not only financial but also separate intellectual resources that will ensure the effective use of innovative technologies in the banking process.

Therefore, it can be argued that the key requirements for digital banks need to be considered from the standpoint of the consumer, the investor, and the bank itself, its IT architecture. From the client's point of view, the digital bank will be subject to such basic requirements as an interactive and intuitive overview of the movement of its financial flows in particular and, in a broader sense, the use of biometrics as a means of access and automation of all payments (Table 1).

Table 1: Basic requirements for digital Internet banking

From the client's point of view	From the position of an investor	From the position of the bank
Holistic consumer experience	Fully digital payments	Flexible IT infrastructure
Biometrics	Digital wallets	New digital data

		warehouses
Mobility	Automation of product sales and their creation	Advanced analytics
Fully digital paperless processes	Multichannel	Artificial Intelligence
Electronic credit card	Financial planning, robo-advisor	Comprehensive business model
Support for p2p transfers and crowdfunding, including p2p lending	Support for medium and small businesses	Security

Source: [28]

Thus, from the investor's point of view, the digital bank should be able to create new value with the help of artificial intelligence tools that take care of the client's financial condition and monitor its budget and mandatory payments; digital wallets, which are very important for the implementation of value-added services; digital sales platforms, etc. From the standpoint of the bank itself, as a kind of technological intermediary between financial technology companies and traditional financial institutions, the digital bank must change approaches to the design and use of digital data warehouses, speed of response to new information, management, and control model and more. In general, the problems of motivating market participants to digitally transform banks seem different, but they are all based on the specifics of new digital technologies that integrate complex banking systems with mobile devices and build a new system of relationships between banks and their customers.

In addition, digital banking requires fewer branches and separate divisions of the bank, and headcount, as much of the banking products are fully automated. Therefore, digitalization blurs the line between digital and other services and opens up the banking industry to greater competition based on the principles of digital banking. The role and importance of information resources are also growing based on innovative technologies. Therefore, all this contributes to the fact that customers of banking institutions have the opportunity to use the electronic banking service in full.

On the other hand, the already existing digital solutions, which are currently widely used in banking, in practice prove the growing popularity of digital banking. The reasons for this are as follows:

1. Digital banks use more modern IT solutions, such as chatbots, biometrics, etc.
2. Digital banks release new products much faster and can thus more quickly meet customer needs.
3. Due to the lack of physical branches, digital banks have significantly lower operating costs.

In addition, according to international experience, today the level of trust in traditional banks remains consistently high, but a significant proportion of customers are beginning to use the services of digital banks and fintech solutions. Therefore, the digital transformation of traditional players and their services today is becoming a good opportunity to consolidate their position in the digital world.

Thus, the digitalization of the bank involves the formation of a system of measures aimed at deepening cooperation with fintech startups in order to achieve long-term development goals related to the introduction of innovative methods of work, new banking products and services to increase and expand customer base and increase the bank's competitiveness. Accordingly, it can be argued that the digitalization of the banking system is an inevitable future – both from the point of view of customers and the banks themselves.

The inevitability of such trends is determined not so much by the speed of development of new technologies, but by the possibility of their integration into existing communication networks and devices. At the same time, banking institutions that will not carry out digital transformation in the near future are doomed to fail in competition in the market. This is confirmed by global trends in bank digitalization (Fig. 1).

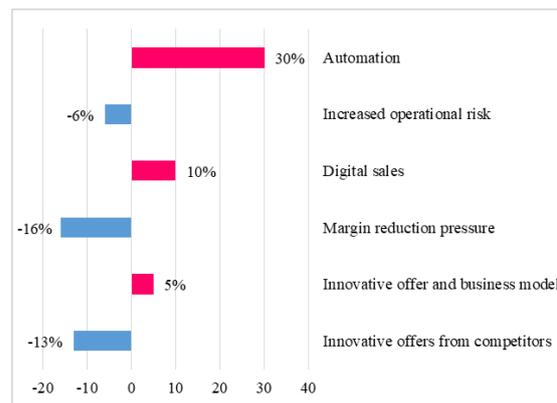


Figure 1 – The impact of digital transformation on the level of bank profits [29]

In addition, digitalization is most important for banking institutions, as long-term global forecasts suggest that the profitability and net return on equity (ROE) of the banking business will remain stagnant. Over the last 10 years, the average global return on investment of banks is 8-10%, which barely covers the cost of their own capital. And by 2025, the return on investment of the banking sector will steadily decline, and as a result, will be 5.2-9.3%. According to such forecasts, the desire of banks to go beyond the financial services sector to more profitable segments, which operate on the principles of digital banking, seems logical [22].

Thus, we conclude that the formation of digital banking in modern conditions is a constant dynamic process in which banking will inevitably adapt to the current technological dimension because it is pushed by both non-banking competitors and their customers. Therefore, steps towards the implementation of the latest technological advances for users, as well as for employees of the banking sector are becoming commonplace. On the other hand, in order to maintain a competitive position, the digital transformation of banks must take place as soon as possible. Even now, commercial banks have only two options: either to carry out digital transformation with the help of fintech companies or to become fintech companies themselves and turn into digital banks.

Thus, the prospects for the development of banking services as such depend on the active use of the achievements of the digital revolution. At the same time, it is already clear today that this is a complex and ambiguous process. If it continues to develop without the accompanying institutional, economic, social transformations, it may exacerbate global imbalances, especially the problem of inequality.

Digital banking is associated with the development of financial inclusion of the population, including the growth of consumer lending in countries with low incomes and low levels of human development, which often leads to financial insolvency and bankruptcy of households. In such countries, the development of financial services should be secondary to the general economic and social development of the population.

## 5 Conclusion

Thus, we can conclude that in modern conditions, effective management of banking in terms of its transformation to the principles of digital banking is possible only if the formation and implementation of an appropriate strategy for digital relations management. In turn, this will also determine the overall level of complexity of pricing approaches for modern digital banking products, which is a complex but inevitable process for most commercial banks.

Therefore, based on this, we can determine a set of system prerequisites that can currently increase the efficiency of

banking in terms of its transition to the principles of digital banking:

- Intensive digitalization of banking products results in the growth of an array of data that is subject to constant and continuous analysis. At the same time, the involvement of analysts is an extensive way, and the use of software solutions based on artificial intelligence allows for fast and efficient data processing and implementation in ready-made digital products of the bank;
- Rapid technological development allows an increasing number of bank customers to use more complex banking products due to the constant growth of digital capacity of used gadgets and devices, which over time become cheaper and more accessible to even more consumers;
- Application of scientific research in the process of analysis of market data and digital behavioural mechanisms of the bank's customers, which allows identifying key structural elements even in the most insignificant data, based on which there are additional opportunities to form a strategy to increase bank profitability;
- Large-scale research in the field of software solutions allows improving existing and applying completely new algorithms for analysis and use of large data sets, the processing of which using artificial intelligence becomes the basis for more effective decisions in the field of digital banking products.

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