DEVELOPMENT OF THE FUNCTIONALITY OF MOBILE APPLICATIONS IN CRISIS SITUATIONS: THE CASE OF POLISH COMMERCIAL BANKS

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Purpose: This paper aims to contribute to the field by exploring the development of the functionality of mobile applications in crises using commercial banks as an example.

Design/methodology/approach: This research was conducted between 2020 and 2022 in 13 commercial banks, performing a total of 390 complete tests of mobile applications by 30 clients (respondents).

Findings: It was found that mobile applications are becoming a significant customer service channel in some banks. In addition, the mobile application is helpful for the client since it can replace personal contact with the bank in terms of service without needing additional support from an advisor in other contact channels. It was also found that crises significantly accelerate the development of mobile applications to meet customers' needs and expectations.

Research limitations/implications: The research was conducted as part of the Institution of the Year project in 2020, 2021, and 2022. The study was carried out in 13 commercial banks, performing 390 complete tests of mobile applications by 30 clients (respondents).

Practical implications: Crises, which have occurred frequently in recent years, force managers to take measures to respond quickly to the needs and expectations of customers. The outbreak of the Covid-19 pandemic made it impossible for many customers to contact direct sales field personnel directly. The banking sector has also been affected by this problem. Although banks had used mobile applications for some time, customers could only use a limited set of functions. They had to go to a bank branch to open an account or take a loan.

Social implications: To meet customer requirements, bank managers make strategic decisions to improve mobile applications to meet the needs and expectations of customers and achieve a high level of satisfaction. There are many studies on responding to crises in various sectors. The research results will positively influence the improvement of the quality of services as well as the progress of the quality of life of society.

Originality/value: No research has been conducted on customers' role in creating new mobile application improvements. Therefore, the article presents the research results in this field, and the appropriate conclusions were drawn.

1. Introduction

Crises frequently occur due to natural disasters, technical failures, terrorist activities, disturbances to public order, and threats to the state's and citizens' security, e.g., a pandemic. Organizations should prepare appropriate contingency plans in the event of a crisis. This also applies to the banking sector; in situations where uncertainty is high, managers of banks should be prepared to change their approach to communication via the web interface to reach their clients.

Many organizations try to meet their client's needs and expectations in such situations. Bank managers should be prepared for crises like pandemics or war and adapt smoothly. Bank management must view the banking system approach from a strategic point of view. The development of electronic banking is a way to meet customer expectations, which allows customers to make transactions without leaving home. The introduction of several restrictions in the public domain and some industries due to the pandemic and the economic lockdown lasting several months did not diametrically affect how customers use electronic banking. Banks, on the other hand, make every effort to ensure that the transition to remote service takes place smoothly and without significant inconvenience for customers and employees while maintaining transaction safety. Therefore, we should expect an increased emphasis on developing and refining electronic banking systems.

The development of banking services and keeping up with subsequent changes in the banking industry, as well as caring for the quality of services and meeting customer wishes, is one of the main approaches to increasing and developing the competitiveness of banks. The quality of banking services is one of the most important factors influencing the customer's perception of a bank and, consequently, its financial results (Matuszak-Flejszman, Łukaszewski, 2022).

Electronic banking has become essential to achieving customer satisfaction and loyalty, establishing closer customer relationships, and meeting user expectations.

In addition, bank customers using mobile banking applications experience many advantages, including convenience and time saving, availability, information transparency, curiosity, choice and comparison, customization, bank promotional campaigns, fashion for mobile banking, and financial benefits (Filotto et al., 2020; Śmiatacz, Samek, 2016).

Technological innovation and digitalization offer customers easy access to banking services, and customers appreciate a need-based sales approach. A bank's attitude toward creation positively influences purchase intentions (Yip, Bocken, 2020).

Since we live in a modern era brought about by the success of smartphones that have changed how billions of people work and live, especially during the Covid-19 pandemic.

The pandemic has tremendously changed the world economy entirely and impacted most businesses. The banking system plays an essential role in this situation because it is a crucial component from an economic point of view. In recent years, the banking system has adapted continuously – it has been reinvented to keep up with customer expectations and the need for cost reductions (Marcu, 2021).

However, remote access channels are increasing; we have already observed more significant increases long before the pandemic. From the beginning of April 2019 to the end of June 2020, the number of active internet banking users increased by nearly 140 thousand, i.e., 0.73% compared to the first quarter. For comparison, the quarterly increase in the previous period – from the beginning of January to the end of March 2020 - amounted to 3.56% (nominally 650 thousand). However, in Q2, the total number of active individual internet banking customers exceeded 19 million for the first time (Barbrich, 2021). Crises, such as a pandemic or the outbreak of war, contribute to the development of the banking system strategy in terms of meeting customer requirements.

The COVID-19 pandemic accelerated the digitization of the banking system, although the need for digital innovation and strategies was an essential factor in banking well before the pandemic outbreak.

An attitude of the bank toward innovation positively influences purchase intentions (Yip, Bocken, 2020). Bank managers need to focus on digital transformation and migrate traditional banking services as it does not come naturally from customers. Bank management must be accessible, transparent, and easy to use, with acceptable and lower costs (Marcu, 2021).

Customers need a friendly interface and security to take a step toward digitalization. They also want a particular bank with which to have a closer and more personal relationship and to be their partners (Filotto et al., 2020).

Some believe that technology and new trends will replace traditional banks, while others argue that technology will support and complement conventional banking systems. However, the banking system will move to another, more connected, digital form of organization. New digital processes are now changing banking processes (Khanboubi et al., 2020). Managers of banks need to continue developing these strategies, as the trend towards digitalization has also reached segments that were not as receptive, such as the elderly or the rural population. Asian banks have accelerated the launch and development of digital customer services and have not encountered significant customer communication problems (Dahl et al., 2020).

The results show that banks try to keep up with customer expectations and innovative products and services. Moreover, no one knows what tomorrow's future will look like. Still, those banks that will soon modernize their IT infrastructure and provide online access to banking products and services will enhance customer experience (Marcu, 2021).

Therefore, many processes have been digitized to retain customers in banks that bring benefits and new threats and challenges.

Adapting banks to new requirements is a growing challenge for bank managers, especially in times of emerging crises such as pandemics or the outbreak of war. In Poland, the relatively highest increase in activity was recorded in the case of mobile banking users. The number of users of banking applications for mobile devices at the end of June was 12.933 million and was higher by 556 thousand, or 4.49%, compared to the end of the first quarter of 2021. Over 6.48 million users from this group are mobile-only customers. This means that over 50% of mobile banking users were people logging in to the application at least once a month while not logging in to banking using a standard web browser. The number of people using mobile banking increased in the second quarter by 359 thousand users, while in the first quarter of this year, the growth of mobile-only customers amounted to 310 thousand people (Barbrich, 2021).

The number of active users using banking services in electronic access channels (internet banking clients and mobile-only clients) reached 25.5 million people in Q2, which, with the total number of electronic banking agreements at 37.59 million, already accounts for 67% of the current use the potential of remote access channels to banking services – undoubtedly the highest indicator in the current monitoring of the active use of electronic access channels to banking (Barbrich, 2021).

Therefore, considering the efficient tools necessary to provide services in applications, the banking system should consider customers' needs and expectations. It is essential to consider all customer requirements and expectations when creating or improving the tool and to ensure the availability and security of mobile applications to such an extent as to meet customer expectations fully. So far, no research has been conducted in Poland to assess the usability of mobile applications.

In response to the research gap, a study was conducted to assess the functionality of mobile applications in crises on the example of commercial banks operating in Poland.

2. Research Methodology

The methods of obtaining information on changes in the functionality of mobile applications were carried out by comparing the research conducted as part of the Institution of the Year project in 2020, 2021, and 2022. The study was carried out in 13 commercial banks, performing 390 complete tests of mobile applications by 30 clients (respondents). All application users

went through the individual tested processes and services themselves. The research design assumed long-term use of the application, the purpose of which was to simulate the processing of a new customer loan application in the bank. The study aimed to map customer service in the initial phase of using the services of a given bank to verify the effectiveness of activities along the entire path of service implementation. Clients activated access, systematically logged in, performing basic operations, and returned to the application over time to perform new tasks. Their task was to assess the access configuration and first impression and to form an opinion on the application's usability while performing subsequent tasks. The analysis carried out was based on customer experience and consisted of the assessment of the ergonomics of the application and expert analysis of the available functionalities. As part of the project, focus meetings of clients' testing applications were also held, during which, together with experts, observations and impressions during testing were exchanged. During these meetings, an indicator of the functionality of mobile applications was developed, a proprietary solution used as part of the Institutions of the Year project.

A study of mobile applications was conducted immediately before and at the beginning of the pandemic (in April and May 2020). A total of 650 mobile application tests were performed. The research methodology was the same, making it possible to compare these periods and evaluate additional functionalities in mobile banking.

During the research, answers were sought on whether the mobile application can provide remote customer service with the bank at the appropriate level.

The following research theses were formulated as part of the study:

1. The mobile application can replace personal contact in terms of service with the bank without needing additional support from an advisor in other contact channels.
2. The mobile application has become some banks' significant customer service channel.
3. Crises have a significant impact on the acceleration of the development of mobile applications.

An additional aspect of this study is the specific period in which it was conducted. The COVID-19 pandemic is of great importance for the development of the functionality of mobile applications. The inability to service many customers has become a genuine reason for the development of mobile applications, which were to take over some of the traditionally served customers in branches or other contact channels where interaction with an advisor is necessary. In addition, after the research, meetings were organized as part of focus groups, during which customers testing mobile applications shared their feelings resulting from this form of contact with the bank. Experts also took part in these meetings. These conclusions provide supplementary information for bank managers responsible for developing mobile applications and can significantly impact the design and improvement of many processes.

During the study, three elements were considered:

- an indicator of available functionalities (according to the methodology developed during meetings in focus groups),
- evaluation of clients' testing applications,
- assessment of the ergonomics of mobile applications.

During the meetings in focus groups, the weights of individual elements of the assessment for a global score were determined: the indicator of available functionalities of 70%, the evaluation of customers testing the applications at 25%, and the assessment of ergonomics of 5%.

3. Mobile app assessment areas

When surveying the functionality of mobile applications among users, several areas were taken into accounts, such as general customer assessment, application activation, logging into the application (functionalities and ergonomics), sending the account number, payment methods, transfer form, authorization, recipient management, standing orders, payments by scanning, BLIK functions, history, notifications, telephone payments, card management, contact with the bank, editing customer data, additional functionalities, additional products, application limits, and security.

3.1. The scope of the data provided

The direction of changes in the activation of the mobile application is simplicity and reduction of complicated procedures. This is to ensure the speed of activation of a new application without the need for help from bank employees. Banks generally require only a few selected data, such as PESEL, log-in, or PIN. In the case of three banks, the respondents were asked to provide their mother's maiden name. During activation, bank customers receive an activation code via SMS or an incoming phone with the code. Only in the case of two banks is it necessary to log in to internet banking to activate. However, there has been a visible trend to change this additional verification method in recent years. Reducing the data coverage is noticeable compared to the results of studies conducted in early 2020. These changes are mainly due to the pandemic and are consistent with customers' expectations. Data overload causes incorrect input or additional doubts and questions, which is associated with the need for further contact with the advisor through other access channels or, in many cases, resignation from using the mobile application. Customers who are not interested in switching to a mobile application in the face of a new pandemic threat are more likely to decide to use this channel remotely.

3.2. How to log into the application?

In the first activation activities, the clients determined the method of logging into the application. All surveyed banks offered to log in with biometrics, and 50% provided biometric acceptance of performed operations. Frequent logging into the application and performing various operations meant that customers increasingly chose this method of logging in and authorizing operations. In activating the application, there were no biometric authorization settings. Only Alior Bank provided this option. Considering the application activation process, the highest-rated bank was Alior Bank, while the logging-in rate was the highest at Credit Agricole.

Customers liked the functionality of personalizing the biometric reader call, which allows the user to log in to the application immediately after clicking the icon, skipping the first screen with shortcuts. This functionality was available only at Credit Agricole and mBank. Pekao clients had a problem with finding the option to enable/disable biometric login from the application menu. The system did not support the biometric login settings (it is missing in the activation process or during the first login). Finding this feature was difficult due to its position in the "personalization" - "change login method" section. Customers searched for "security and consent" and "passwords, PINs, and login," guided by the fact that there is a PIN in this section, which is also used for logging in. This path was the most intuitive for customers (respondents) because most applications on the market offered a choice of login method and PIN change in one place. This example shows that what matters dramatically is the intuitiveness of functionality, not the mere fact that a given application has it. The test results are shown in Figure 1.
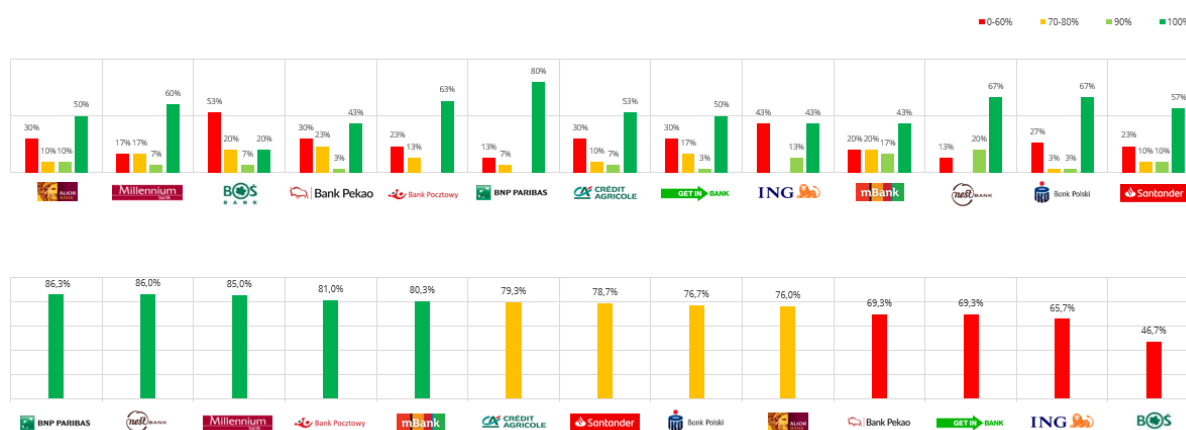

Figure 1. Answer to the survey question, how many % do you agree with the statement: "I found the option to enable/disable biometric login without any problems". Source: Own study based on the research carried out in the first quarter of 2022 as part of the Institution of the Year project (realized by mojebankowanie.pl).

3.3. Assessment of available payment methods

One of the elements of the assessment of mobile applications by testing customers is the first impression, which shows clarity and ease of navigation in customers' eyes. The highest-rated applications were those of Alior Bank, BNP Paribas Bank Polska, PKO BP, Bank Millennium, and ING Bank Śląski. Only two banks did not meet customer expectations, which is a 30% better result than a survey conducted two years ago.

A frequently used feature is finding and sending the bank account number. Most banks had no problems with this. Only two banks were assessed negatively by customers at 50%. In this case, a significant improvement is visible compared to the research carried out at the beginning of 2020, where this problem occurred in 6 banks. In two banks, none of the clients managed to send their account numbers directly. It should be noted that one bank (Bank Ochrony Środowiska) did not have such functionality at the time of the study.

During the tests, the payment methods available in the applications were verified. The client's (respondents) task was to find them in the applications. The assessment of available payments in applications is presented in Figure 2.
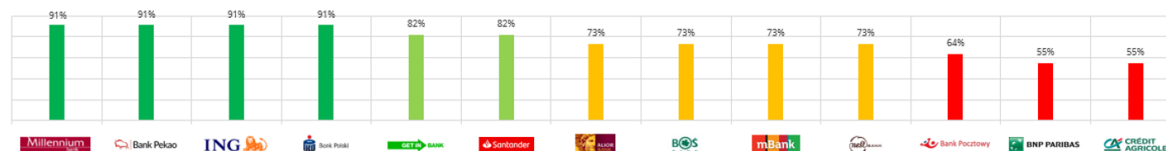
Figure 2. Assessment of available payment methods in mobile applications. Source: Own study based on a survey conducted in November and December 2021 as part of the Institution of the Year project (realized by mojebankowanie.pl).

Finding own, domestic, or instant transfer options were available in all banks and easy to find for customers in almost every application. The problem appeared when searching for an instant transfer in 3 banks. The transfer to the phone number was available in 9 banks. The essential BLIK function, which is the BLIK code, was already available in every mobile application, which is excellent progress compared to the results of the research conducted two years ago and following the basic need of customers to pay for online purchases. Other BLIK functionalities are no longer standard in mobile applications. BLIK checks were available only in 4 applications, a request for a BLIK transfer in 3, and a BLIK account division in 2 applications. Standing orders can be made in almost any mobile application. Only two banks do not offer standing orders. In the objective assessment of the BLIK function, the applications of PKO BP, Bank Millennium, and ING Bank Śląski were ranked very high.

The respondents had no problems with the implementation of basic instructions. The choice of the source account, the selection of the recipient from the list, or the pasting of the invoice is available in every application. For convenience, numeric keypads appear automatically in all applications when entering the account number and the transfer amount. The system also checks the available funds before authorization in almost every bank (only one does not have this

functionality yet). It was not difficult for our clients to make the first and subsequent transfers in all applications.

The study evaluated the transaction authorization process in several variants. Only five banks offer most of the available authorization methods. If the approval is done by entering the PIN, the keyboard should be substituted automatically, and after entering the last digit, the acceptance should be confirmed automatically. This is a great convenience when entering data. However, this happens only in half of the tested applications. Audience management was assessed in the same way. The ease of adding recipients is a valuable convenience for the customer. The best-rated applications in this dimension are Bank Millennium, BOŚ Bank, Bank Pekao, and ING Bank Śląski. The ability to add recipients to the list of recipients from the history of operations positively surprised customers in the ING application. Finding the list of recipients was not intuitive and fast everywhere, and in 4 applications, serious difficulties were encountered.

A prevalent form of payment is scanning a QR code available in 12 analyzed applications. Importing the code in the gallery is becoming a standard because customers often receive invoices electronically. Eight applications allow a customer to import a QR code.

The history of operations in the mobile application was assessed well in 9 banks, as shown in Figure 3.
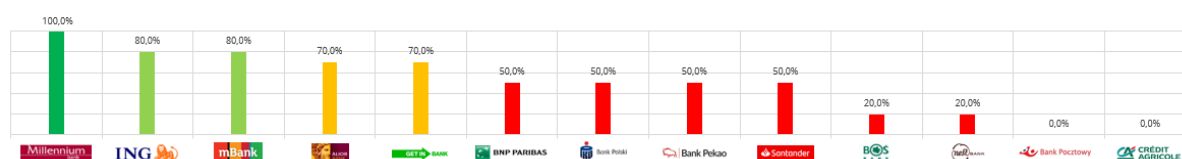

Figure 3. Objective assessment of the history of operations in banks' mobile applications. Source: Own study based on a survey conducted in November and December 2021 as part of the Institution of the Year project (realized by mojebankowanie.pl).

Alior Bank, Bank Pekao, mBank, and Nest Bank applications were rated the highest in this respect. Important functionalities appreciated by customers are extensive search filters, covering not only the amount and period but also the currency, type, and type of operation or category of expenses. Searching for a transaction with a phrase or searching for an amount by entering a word and automatic searching by entering characters is an additional convenience for customers. Most applications offered this functionality. Mobile applications also allow a user to push notifications, ranging from receipts and expenses to more complex information. Customers need to be able to configure them in different ways, depending on individual preferences. Sending a notification about each incident is burdensome, which was confirmed by our clients during meetings in focus groups.

For this reason, having more detailed settings for notifications is so essential. The proposed settings for push notifications based on the history of operations were a positive surprise at mBank. Only in the applications of 3 banks is it not yet possible to set push notifications, which was an example of a lack of adaptation to customers' needs.

An essential element of the app evaluation is the management of cards and payments by phone. The best applications give customers the ability to add cards for mobile payments. This functionality makes it possible to add a card without the need to use a card. In the study, customers testing the applications added cards in 3 banks: ING Bank Śląski, Alior Bank, and Getin Bank. The virtual contactless BLIK card was already available in the applications of 6 banks. Canceling the card allows for ten applications, but in the previous analyzed period (in 2020), banks already offered this functionality (it was added by one bank in this interval). Most applications also allow users to edit card limits, change PINs or order a new card. Half of the surveyed applications will enable clients to add a card to a foreign currency account, which is very important when traveling abroad. Skipping a visit to the bank or calling the hotline is a great help and allows the user to add a card even when abroad. mBank has distinguished itself with additional options, such as excluding foreign transactions, turning off the magnetic strip, turning off DCC transactions, or turning off surcharge transactions. However, as reported in a 2020 study, these options were available before.

The applications of many banks allow the customer to contact the bank: the "tap to talk" hotline is available in 7 banks, and the chat from the application level in 5 banks. This is the fastest way to interact with customers without additional customer identification. The assessment results are presented in Figure 4.

Figure 4. Assessment of contact with the bank after logging in to the mobile application. Source: Own study based on a survey conducted in November and December 2021 as part of the Institution of the Year project (realized by mojebankowanie.pl).

In addition, some applications allow the user to edit select customer data, such as data from an ID card, blocking an ID card, or changing a correspondence address or contact phone number. Only one bank – ING Bank Śląski – decided to change the phone application for authorization.

Mobile applications also provide additional options, such as purchasing tickets, paying parking fees, exchanging currency, or opening banking. PKO Bank Polski, ING Bank Śląski, Santander Bank Polska, and Bank Pekao stood out in this regard. Users could buy public transport tickets in half of the tested applications; in 5, they could pay for motorway travel and 8 for parking. The testing clients had no significant problems with paying for parking; in 4 banks, it was transparent and intuitive for everyone.

An essential element is the ability to personalize the application, such as choosing a default account, choosing a context, hiding selected products, changing the order of displaying products, adjusting shortcuts on the desktop after logging in, and the account balance in amount and percentage, selection of accounts to show the balance, language selection, etc.

The applications allow users to apply for additional products: personal, savings, and currency accounts, deposits, account limits, credit cards, insurance products, and even company accounts. Our sample clients applied for a foreign currency account to check these functionalities. It was possible in the applications of 10 banks and caused no problems to the testing clients.

Security is an essential topic in mobile applications. The change of data and available limits are confirmed differently in individual banks. In an objective assessment, Bank Millennium, Credit Agricole, BNP Paribas, Nest Bank, PKO Bank Polski, and Santander Bank Polska were rated the best in terms of security. The maximum transaction limits were imposed at many banks. Minor restrictions were imposed only on Bank Pekao, Nest Bank, and ING Bank Śląski.

3.4. Overall customer appraisal of the app

After analyzing mobile applications from 13 banks, considering their functionalities, ergonomics assessment, and evaluation during tests of real customers and their observations during meetings in focus groups, the best ones were selected. The results for individual criteria and the weighting of the assessment are presented in Figure 5. The results regarding the best mobile applications according to the respondents are shown in Figure 6.
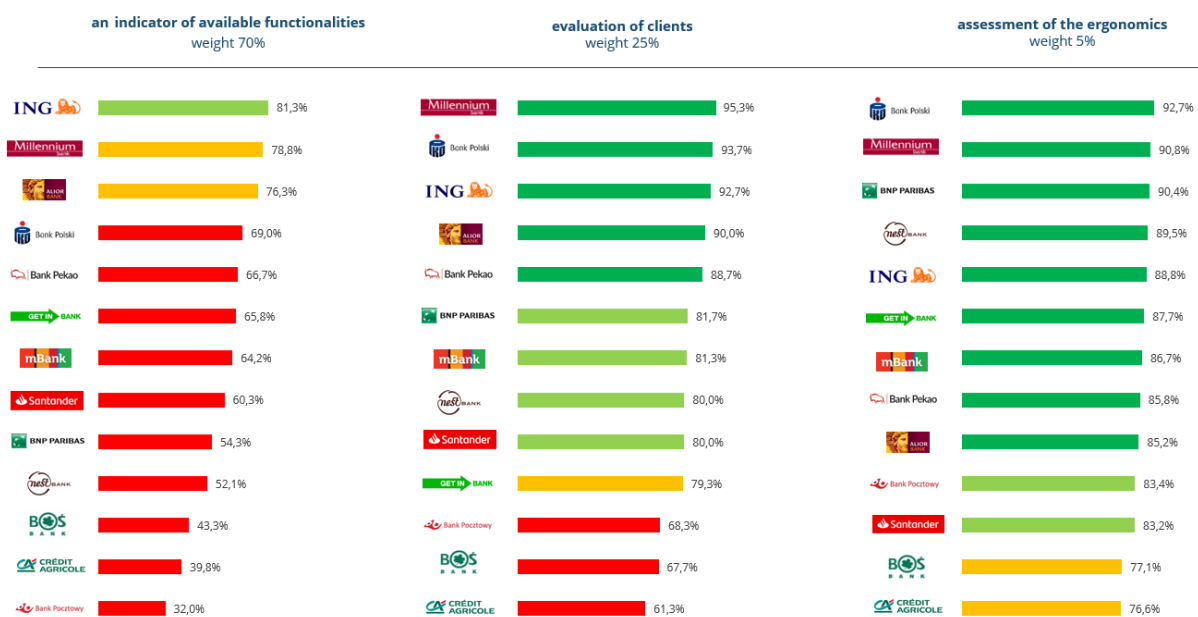
Figure 5. The results of the evaluation of the choice of the best mobile application. Source: Own study based on a survey conducted in November and December 2021 as part of the Institution of the Year project (realized by mojebankowanie.pl).

The best mobile applications are from ING Bank Śląski, Bank Millennium, and Alior Bank. In the period considered, the applications of these banks were also among the best on the market as assessed by the Institutions of the Year rankings. These banks systematically follow the market requirements and introduce improvements expected by customers.
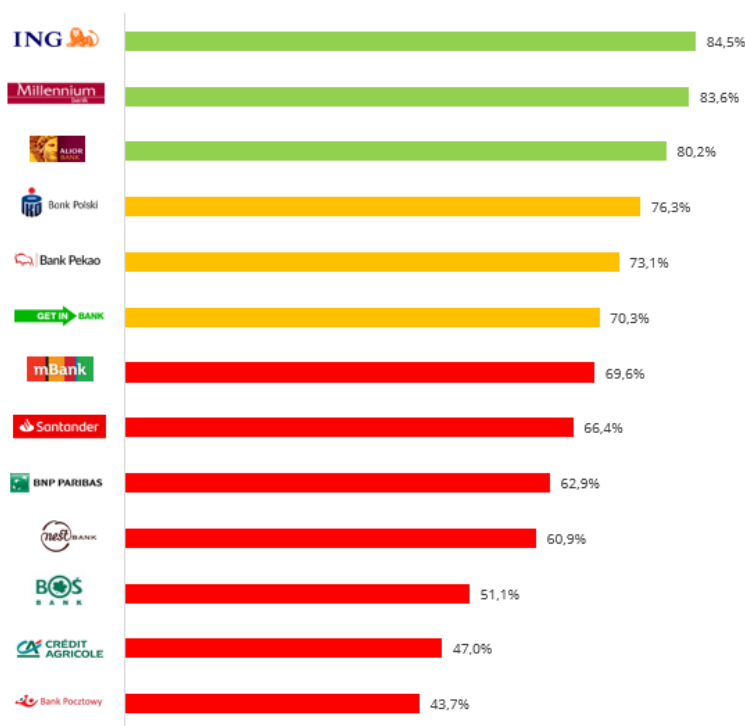
Figure 6. The best mobile applications – global evaluation results. Source: Own study based on a survey conducted in November and December 2021 as part of the Institution of the Year project (realized by mojebankowanie.pl).

4. Benefits of using mobile applications

Since the beginning of March 2020, banks have faced a new challenge related to customer service during the COVID-19 pandemic. Another element associated with securing contact with the bank was added to the research conducted periodically as part of the Institution of the Year project during the pandemic outbreak. The introduced facilitation in access to the application, requiring less data input at every stage of mobile applications, must go hand in hand with security. The pandemic has significantly impacted banks' functioning and mobile applications development because security is an additional argument for redirecting certain operations to this place. Even before the pandemic outbreak, banks tried to turn some functions into remote services, but from 2020 this trend has become faster than before. Typically, the direction of changes in mobile applications is determined by customers whose opinion is critical. At this time, clients and banks wanted to redirect as many operations as possible to minimize personal contact with the bank.

In customers' view, an excellent mobile application must be intuitive. Customers want to have many functionalities in the application so they do not have to return to online banking or other contact channels with specific functionalities. An important function is the ability to personalize the application. During focus group experiments, customers would even like to

adapt their application to current, often temporary, situations and do this smoothly and quickly using a minimum number of steps. During the focus meetings, clients noticed that not all banks quickly adapted the application to market requirements. The lack of basic functionality in some applications, mainly used by customers, was surprising during the focus meetings. In this case, listening to the voice of customers is especially important.

Looking at the speed and direction of the introduced changes, from the point of view of banks making improvements to their applications, an additional objective is reducing customer service costs in other contact channels. The simplicity of mobile operation results in fewer customer inquiries in other media. High functionality means a lower need to use traditional banking and additional products that clients can apply for through self-complementary data requests that the bank already has in the system. All these factors reduce the need for advisor participation, resulting in cost reductions for personnel and office space.

Because customers use applications frequently, logging in must be simple and quick. In this regard, customers appreciated the ability to use biometrics. Market forces the introduction of modifications expected by customers and following the changes already introduced by other banks, which customers demand.

During the meetings in focus groups, the authors were surprised that some applications have specific functionalities that customers did not find during testing, e.g., parking fees or purchasing public transport tickets, even though they had been introduced for at least a year. This shows the problem of communicating new or existing functionalities to customers. Reminding users about the availability of certain valuable functions would be advisable in customers' opinion. Such tips should be personalized, so they increase familiarity with the application and do not end up in the "trash."

The mobile application gives customers great freedom of access to their data and available functionalities, so they have access to banking on a 24/7/365 basis. Due to the pandemic, there was a significant increase in the use of mobile applications. Also, many functionalities planned to be introduced in the coming years appeared in applications earlier than anticipated. The leading banks will use this time window to improve their mobile applications. Others will have no choice but to follow.

Basic functionalities were available in all tested applications, also noted in the previous period. The best bank applications implement new solutions by listening to the customer's voice. Adapting the application to the customer's current needs is the only condition for moving from daily banking to mobile applications. Very often, limits on mobile transaction amount slow down the transition process because the customer is forced to make transfers in online banking and does not use the mobile application extensively in other areas. Banks that do not limit mobile transaction amounts will likely attract more attractive individual and corporate clients. When carrying out transfers, the best applications suggest when the amount transferred will be credited to the recipient's account and show the payment amount. If it is necessary to convert the amount, currency exchange windows are available in the application. Sometimes

the exchange rate in the application is more favorable than that offered in the branch. In such comparisons, customers can test all applications and see the differences that determine the transfer and staying in their banking in the mobile application.

The best applications also give users access to data from accounts held at other banks. It is becoming a standard to apply for government programs such as Rodzina 500+, Dobry Start (300+), and Family Caring Capital. Banks are constantly working to adapt them to new requirements so that customers can quickly and conveniently apply for available benefits.

5. The impact of crises on the introduction of new solutions by banks

The pandemic crisis has accelerated the growth rate of customers using mobile applications. In addition, the applications offer an immediate opportunity to apply for additional banking products "by click." The decision is made almost immediately. This significantly contributes to reducing the costs of handling applications by advisers in other contact channels and will become a new modus operandi. Additionally, one can notice the appearance of new language versions in the applications. The war influenced the acceleration of this process in Ukraine, where the need to extend the language version to include Ukrainian, Russian and English emerged almost immediately. This shows how banks smoothly adapt their applications to the market's current needs.

We live in a quickly changing environment and handle most of our affairs on mobile devices. The bank's mobile application should therefore support customers in dealing with financial issues and payments at every level.

Bank managers should consider the results of research on banks' mobile applications. They reflect trends in application functionality changes and show what functionalities are missing in individual banks that competitors' clients use. Academic studies should indicate the directions and magnitude of change in banks. After the survey was administered, meetings were organized as part of focus groups, during which customers testing mobile applications shared their feelings about the use of applications of all banks. They are a good reflection of the actual feelings because they are a group of customers who had the opportunity to verify all applications in the same way, following the same steps. A typical bank customer does not have such a comparison, so banks independently perform their customer satisfaction surveys regarding the use of a mobile application and do not give objective results due to a lack of knowledge of other banks' applications.

Additional conclusions from subjective customer assessments of the survey are also valuable supplementary information for bank managers in application design and improvement. This happens by supplementing the application with the possibility of applying for more and more banking products. Before the pandemic, these were mainly credit and debit cards and

savings accounts, but now the scope of offerings is much broader. These products include cash loans, changing overdraft limits, credit cards, personal and currency accounts, children's accounts, purchases of investment products, mortgage loans, travel, motor, property, and health insurance. These products are systematically supplemented by looking at competing banks and considering customer needs. Such rapid development in this area took place during the COVID-19 pandemic. During the pandemic, the ability to purchase non-banking products in mobile applications was also made available. e.g., Such products include public transport tickets or parking lots and highway payments. From the customer's point of view, this is a great convenience to which users quickly get used. These additional functionalities increase the frequency of daily application use and enhance customer loyalty to the bank.

This research focused on the opportunities created for banks resulting from developing and improving mobile applications. The development of mobile applications significantly accelerated during the pandemic. Currently, the enhancements in functionality are practically continuous. The last novelty that appeared after the survey was made available by Bank Pekao S.A. in the Qlips payment mobile application. It is a service that speeds up the payment of invoices and bills and was available in electronic banking at PKO Bank Polski, Bank Pekao S.A., mBank, and Bank Millennium. Other banks will likely replicate this. It is an excellent example of the speed of changes in banks' mobile applications. Managers face new behaviors (of employees and clients) and must adapt to the unique challenges as fast as possible. Banks need to build a reliable brand, especially in these times when customers are surrounded by fear and instability. The banking system needs to become more digital and more involved in understanding customer needs.

The pandemic has become a catalyst for changes, accelerating the processes of using new technologies, perpetuating specific behaviors, and increasing awareness in a more comprehensive group of users.

6. Conclusions

The crisis in the form of the COVID-19 pandemic limited direct contact between the customer and the bank, which made it difficult to maintain the bank's customer service at the current level and to achieve current business goals (sale of banking products, acquisition of a new customer). Therefore, banks very quickly focused on developing remote forms of contact and tools enabling remote conclusion of contracts without the need to visit the bank. Most banks quickly implemented remote account opening processes using the selfie method, which allows you to open an account without leaving your home using a smartphone (we take a few photos of the face, make specific gestures, take a picture of the ID card, fill out the application and even in a few minutes we are the holder of a personal account). The best banks allow you to

start and finish the entire account creation process immediately in the mobile application. As a result, the client completes creating an account logged in to his application, which he can use practically immediately. All you need to do is top up your account because the mobile payment options offered in the applications, payments with the BLIK code or BLIK contactless payments, give you the real possibility of managing your funds.

More and more matters can be dealt with on the hotline without visiting the facility. The continuous increase in the role of the telephone channel has also been visible in the recent period. Banks here make things easier by allowing the customer to log in to the mobile application and talk to the consultant about their products from its level. The best banking applications offer the "tap to talk" function, thanks to which a customer logged in to the application connects with the bank as an identified customer with one button. You do not need to log in with your customer number and password for telephone service. For verification, consultants only need to confirm primary customer data, such as the mother's first name, last name, or maiden name. However, this contact option has a downside – the call is made to a landline number. No bank met the expectations of a customer who may find himself in an emergency abroad, where there may be a problem with coverage, or the costs of calling Poland will be exceptionally high. The optimal solution would be to contact the mobile number, thanks to which it would be possible to connect, e.g., via WhatsApp.

Regardless of the development of the hotline and the support offered by consultants, the client needs independent remote servicing of the account and other products. Until now, most of the basic operations could be performed in online banking, but the dynamic development of the telephone market has almost completely replaced traditional telephones by introducing smartphones, which have become increasingly common. Thus, most companies (not only from the banking market) have started to submit mobile applications, which have replaced, e.g., loyalty cards. Banks have had mobile applications for a long time, but in the last few years, we have seen their dynamic development, and one of the accelerating factors was the COVID-19 pandemic. We have been observing the continuous development of new application functionalities for two years. Some of them are innovations, while many changes in applications involve the transfer of functionality from online banking to mobile applications. The constantly growing market share of "mobile only" customers forces the application to be adapted to full account service on the phone without using online banking. Hence such functionalities as, for example, changing the customer's address data or updating the ID card are more and more often visible in applications. The migration of functionality from one channel to another brings a considerable challenge in maintaining the intuitive use of the application and its navigation. A few years ago, the application on the phone was mainly used to check the account balance and history of operations, make a transfer, or generate a BLIK code. Today, in the application on a small screen, banks have to fit a much more comprehensive range of functionalities, presenting them so that the customer knows about their existence and wants to use them.

It is essential to position the functionalities that are used most often and to group those that are used less frequently intuitively. When assessing the application, customers most often refer to the convenience of using it. The best apps offer personalization of the app screen. Depending on the bank, some products or sections in the application may be hidden. The best applications allow you to change the order of products, mask product history, change product names as well as personalize shortcuts on the first screen, change the application wallpaper and dark/light mode, and even personalize the triggering of the biometric factor, thanks to which the customer decides whether he wants to log in immediately or use from shortcuts before logging in. In terms of personalization options, the most advanced applications offer much more than the non-banking applications used by the client. An important area to be developed is customer education in the field of knowledge, which is possible thanks to the application. While customer onboarding is standard in online banking, it is in vain to look for it in applications except for tutorials and laconic welcome information. The customer is on his own. If he properly scrupulously "clicks" the application, he will get to know its possibilities.

From the customer's point of view, an excellent mobile application has several possibilities by providing various functionalities in the field of handling your banking products, applying for new products, and even using other non-banking services, such as a trusted profile, public transport tickets, motorways, or parking lots. The best banks operate multi-threaded and develop the application in every respect. Still, today most banks are at the stage of chasing the leaders. Currently, it can be seen that a certain standard of mobile applications is being formed, but the actions of the leaders are still raising the bar. The application's user-friendliness is determined by the ease of performing basic operations, such as a domestic transfer, and by details that customers appreciate, such as the ability to search for a recipient from the history of functions without having to define it in advance. Compared to last year, biometric authorization, which six banks already offer, has developed significantly. Accepting the process takes only seconds; the customer does not have to enter a PIN or password. It is more common to facilitate the payment of bills in the form of the "Qlips" service or the possibility of scanning the entire invoice without entering the transfer details. However, in both cases, we discuss individual banks on the market.

Customers particularly appreciated the functions related to mobile payments and card support. Apart from BLIK, checking the balance and history and paying bills were the main functions they used daily. Both Apple Pay and Google Pay are not available in all banks, and although these are entirely isolated cases, they show a gap. Sound from the point of view of an emergency, e.g., loss of a card abroad, is the ability to add a card for payment by phone from the times after the reservation. Thanks to this, the customer can always use the funds abroad without possibly paying with the BLIK code. It is a pity that only three banks currently offer such a function. The customer buying online and paying with the card can see the card number and CVV code in the application only in two banks. Customers of other banks must find the card physically to provide the data. Also, only two applications offer to check if the card has,

for example, a Spotify subscription. The remaining customers only need to verify the account history.

An important issue is the security of the client's funds. The applications are very well secured, but the client is the weak point. Facilitating the use of the application carries with it risks. Logging in to the application and authorizing operations with the same PIN is, on the one hand, convenient to use, but on the other hand, the risk of losing funds in the form of losing the PIN and the device on which the application is installed. The best-secured applications for changing key payment-related settings require additional security, e.g., a phone with a code and add a password that only the customer knows and which is different from the PIN. Regardless of the shield itself, customer education is critical. There is a lack of action in this area in mobile applications today. Apart from developing functionalities, banks should also take care of this issue.

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