European Research Studies Journal
Volume XXVII, Issue 3, 2024

pp. 1327-1340

Banks in Poland in the Context of the Development of Communication Infrastructure in the Digital Economy

Submitted 16/09/24, 1st revision 05/10/24, 2nd revision 24/10/24, accepted 15/11/24

Agnieszka Budziewicz-Guźlecka[1], Mariusz Woźniakowski [2]

Abstract:

Purpose: *The aim of this article is to attempt to identify the use of modern information and communication tools by banks operating in Poland.*
Design/Methodology/Approach: *Banks were audited in two areas: the use of social media and modern technologies in banking access channels for customers. The study was carried out in October 2018 and repeated in April 2024. This gave the opportunity to observe changes in the scope of ICT solutions used by banks over 6 years. In order to eliminate errors in identifying the communication tools used by banks, each time the study was carried out by two auditors - the authors of this study. Additionally, a critical analysis of the literature was used.*
Findings: *Banks operating in Poland actively use tools that fit into the concept of modern technologies. Polish banks are classified among the most innovative banks in the world.*
Practical Implications: *To effectively build customer engagement, it is not enough to create holistic experiences through various channels, an individual approach and constant optimization of the actions taken are also necessary. The combination of the optichannel and omnichannel approach is the key to success, which can be achieved by using the right banking solutions.*
Originality/value: *The article presents the results of own desk research. The issue presented has not previously been addressed in discussions published internationally.*

Keywords: *Digital transformation, virtual space, omnichannel, bank, social media, ICT.*

JEL classification: *G2, O3, M3.*

Paper Type: *Research study.*

Research funding: *Co-financed by the Minister of Science under the "Regional Excellence Initiative".*

[1]*University of Szczecin, Poland, ORCID 0000-0002-9403-7925,*
e-mail: agnieszka.budziewicz-guzlecka@usz.edu.pl;
[2]*University of Lodz, Faculty of Management, Poland, ORCID 0000-0001-6423-5309,*
e-mail: mariusz.wozniakowski@uni.lodz.pl;

1. Introduction

Digital transformation, taking place in recent years, involves the use of digital technologies by organizations to digitize analog products, services or operations. Rapid technological changes have forced to adapt their services to the needs of the information society, exploit new business opportunities (Drab-Kurowska, 2021). This is aimed at increasing value and competitiveness. Information transformation, in addition to the increased importance of information as a resource for the enterprise, mainly originates from the development of information and information technology, which includes software, community networks, data resources, and information gathering and dissemination.

Thus, digital, information and communication technology has become a key determinant of development and ensuring competitiveness for banks. Banks have a wide range of opportunities to use modern tools. However, digital transformation is more than digitizing existing processes (Thalassinos & Pociovalisteanu, 2007). Digital transformation requires an analysis of how products, processes and organizations can be transformed through the use of new digital technologies. This is because the development of information technology means that the line between the real and virtual worlds is constantly blurring. Such a transformation also applies to banks.

In Poland, banks first used the Internet as an additional service distribution channel, providing electronic banking, including mobile applications. Banks operating in Poland created profiles on the most popular social networks, providing a virtual space to talk about the services they provide. Social media have become an integral part of banking marketing.

2. Research Background

The multi-channel environment, combining online and offline spaces, leads to an increase in the dynamics of interaction with a bank's brand, which in turn affects the intensity of its relationship with buyers. This is due to the fact that these spaces are in strong correlation with each other, interpenetrating and complementing each other (Thalassinos *et al.*, 2013; Thalassinos and Stamatopoulos, 2015).

With regard to marketing communications, this results in its adoption of an increasingly holistic structure, as it becomes an increasingly automated, personalized and coordinated process of dialogue with the individual consumer, in which a variety of media become not only a carrier of information, but also the interface between the bank's brand and the consumer (Bajak and Spendel, 2022).

In many countries, the pandemic has accelerated the digital transformation of banks. For example, in a survey conducted in 2021, 89% of African banks surveyed said that the COVID-19 pandemic accelerated the digital transformation of the organization's internal processes (Finance in Africa…, 2021). In contrast, there was no spectacular change in Poland, as banks in Poland had already undertaken digital transformation activities before the pandemic. In Poland, a reduction in the number of stationary bank branches has been noticeable over the past few years. A comparison in 2019 and 2023 is presented in Table 1.

Table 1. *Number of stationary bank branches*

Bank	**2019**	**2023**	**change**
PKO Bank Polski	1115	963	-152
Bank Pekao	734	507	-227
BNP Paribas	514	387	-127
Bank Millenium	602	367	-235
Santander	505	332	-173
Credit Agricole	359	265	-94
ING	317	227	-90
Alior	212	167	-45
Pocztowy	160	132	-28
mBank	143	82	-61
BOŚ	53	54	1
Total	4714	3483	-1231

Source: *Own elaboration based on data from The Polish Financial Supervision Authority (UKNF).*

Banks are closing branches because customer preferences are changing. Fewer people are going into branches because customers are choosing self-service channels - online and mobile banking. An extensive branch network is no longer needed. The network of stationary branches is also being supplemented by partner branches.

At the end of March 2023, banks operating on the Polish market had more than 23 million customers using mobile devices to access financial services. Compared to the previous quarter, this means an increase of more than 774,000. This is also nearly 2.9 million more than in the same period of 2022. It is worth explaining that a mobile-active customer is considered a customer who logs into his account at least once a month via an application, light service or browser from a mobile device, i.e. a smartphone or tablet. A comparison of 2023 to 2022 is presented in Table 2.

Table 2. *Mobile customers and Number of cashless branches*

Bank	*Mobile customers*			*Number of cashless branches*		
	2022	**2023**	**change**	**2022**	**2023**	**change**
PKO Bank Polski	4872,8	5528,2	655,2	34	34	0
Bank Pekao	2516,3	2855,5	339,2	2	2	0
BNP Paribas	1095,2	1255,4	160,2	145	198	53
Bank Millenium	2015,6	2329,3	313,7	100	108	8
Santander	2366,3	2691,5	325,2	19	16	-3
Credit Agricole	457,3	659,8	202,5	33	75	42
ING	2576	2794	218	188	172	-16

Alior	931,1	1159,1	228	10	3	-7
Pocztowy	77,7	103,2	25,5	nd	nd	nd
mBank	2888,4	3169,6	281,2	33	34	1
BOŚ	22,4	33,6	11,2	13	16	3
Total	19819,1	22579,2	2760,1	577	558	-19

Source: *Own elaboration based on data from The Polish Financial Supervision Authority.*

Mobile banking is used by 19 million customers, 13.5 million of whom are "mobile only" customers. Such people operate their bank accounts exclusively on smartphones. In contrast, the number of non-cash branches has declined slightly.

The cashless branch does not have traditional cash registers, but deposits and withdrawals can be made there - ATMs and deposit machines. Tracking the number of these outlets, once again one gets the impression that the market trend is missing here: while some institutions are expanding their network, others are reducing it or leaving it unchanged. At the same time, it is worth noting that banks are generally reducing the number of branches they have. Thus, if an institution reports a reduction in the number of non-cash branches, the result is usually not a return to a traditional branch (Ropeika-Apoga *et al.*, 2018; Ahmed *et al.*, 2021).

Currently, researchers often point to a huge transformational leap for companies, including banks, due to the pandemic. The COVID pandemic has triggered the need to use services through various distribution channels to the exclusion of direct contact. However, in Poland, there has not been such a revolutionary change as in the case of other enterprises, as banks in Poland had already started intensive digital transformation and operations in the virtual space before the pandemic.

The authors undertook a study of the use of modern information and communication technologies even before the pandemic with the intention of repeating the study several years later. When conducting the initial research, they assumed that such an intensive transformation would continue. However, this did not happen.

3. Research Methodology

For the purpose of market analysis of the use of modern information and communication technologies, banks operating in Poland were selected. A compilation of the Financial Supervision Commission (KNF, 2024) was used - commercial banks operating in the form of joint stock companies (as of the third quarter of 2018 and the first quarter of 2024).

According to the KNF's data, 33 banks meeting these criteria operated in Poland in 2018 (Budziewicz-Guźlecka, Woźniakowski, 2018) and 30 in 2024. The selected banks were subjected to a kind of audit in two areas. The first is the use of social media. The second was modern technologies in banking access channels for customers. The survey was conducted in October 2018 and repeated in April 2024.

This provided an opportunity to observe changes in the ICT solutions used by banks over 6 years. In order to eliminate errors in identifying the communication tools used by banks, each time the survey was carried out by two auditors - the authors of this study. The first area was analyzed in 2 stages:

- It was checked on the banks' websites to which social media sites there are direct redirects on them (e.g. in the form of social plugins, classic hyperlinks, etc.). In the absence of a direct reference to some social media profile in the structure of the website, they were searched for through Google's web browser by typing in the relevant phrase, such as ING Instagram. This method of searching for profiles was applied to the five most popular social media sites: Facebook, YouTube, Instagram, X (formerly Twitter) and LinkedIn.
- The social network profiles or other media (e.g., blogs) identified in the previous two steps were analyzed for content. Only profiles conducted in Polish were taken into account, due to the target audience - a customer from the Polish market. It was checked, first of all, the tone of communication (e.g. commercial - presentation of the offer, press releases, education, etc.) and whether the profiles are updated on an ongoing basis.

The second area checked what ICT solutions the analyzed entities use. Only those tools were included that are directly related to the bank's website (provided that the website is in Polish), or there are references to them in its structure, or there is information where they can be found elsewhere on the web and/or in the real world. It was checked which banks use the following information and communication technologies:

- a responsive website (designed according to the principles of responsive web design),
- e-banking module,
- mobile applications for banking by customers by Android, IOS and other operating systems,
- search engine/locator of outlets by: individual/corporate client, private banking, ATMs/remittance machines and others,
- contact with the bank via contact form, call center, IVR, chat, video chat and others.

4. Research Results and Discussion

In 2018, out of 33 banks analyzed, one (RBS Bank, part of the Royal Bank of Scotland group) did not have a website in Polish (now all 30 have websites in Polish). Also one (HSBC Bank Polska) did not have any social media profile for Polish-speaking audiences. Of the 33 banks, 30 had a minimum of one social media profile of their own (see Table 3 for a detailed list). In contrast, in 2024, out of 30 entities, 24 have min. 1 profile of their own on a social media site.

***Table 3**. Bank profiles on social networking websites*

No.	Name of the Bank	Social media profiles										Corporate blog		TOTAL (number of social profiles)	
		Facebook		YouTube		Instagram		Twitter/X		LinkedIn					
		2018	2024	2018	2024	2018	2024	2018	2024	2018	2024	2018	2024	2018	2024
1	Alior Bank	+	+	+	+		+	+	+	+	+			4	5
2	Bank BGŻ BNP Paribas/ BNP Paribas Bank Polska	+	+	+	+	+	+		+	+	+		+	4	6
3	Bank BPH									+	+			1	1
4	Bank Handlowy w Warszawie	+	+	+	+	+		+	+	+				5	3
5	Bank Millennium	+		+	+	+		+	+	+	+			5	3
6	Millenium Bank Hipoteczny	n		n		n		n		n		n		n	0
7	Bank Nowy	n		n		n		n		n		n		n	0
8	Bank Ochrony Środowiska	+	+	+	+			+	+	+	+			4	4
9	Bank Pocztowy	+	+	+	+		+	+	+	+	+		+	4	6
10	Bank Polska Kasa Opieki	+	+	+	+	+	+	+	+	+	+			5	5
11	Bank Polskiej Spółdzielczości	+	+	+	+	+				+	+			4	3
12	Credit Agricole Bank Polska	+	+	+	+	+	+		+	+	+	+	+	5	6
13	Deutsche Bank Polska									+	+			1	1
14	DnB Bank Polska									+	+			1	1
15	Euro Bank	+	n	+	n	+	n	+	n	+	n		n	5	n
16	FCA-Group Bank Polska		n		n		n		n	+	n		n	1	n
17	Getin Noble Bank/ VELOBANK	+	+	+		+	+			+	+			4	3
18	HSBC Bank Polska		n		n		n		n		n		n	0	n
19	Idea Bank	+	n	+	n	+	n	+	n	+	n		n	5	n
20	ING Bank Hipoteczny	n		n		n		n		n		n		n	0
21	ING Bank Śląski	+	+	+	+	+	+	+	+	+	+	+	+	6	6
22	mBank Hipoteczny	+								+				2	0
23	mBank	+	+	+	+	+	+	+	+	+	+	+	+	6	6
24	Mercedes-Benz Bank Polska	+	+	+	+	+	+	+	+	+	+			5	5
25	Nest Bank		+	+						+	+			2	2
26	Pekao Bank Hipoteczny													0	0
27	PKO Bank Hipoteczny									+	+			1	1
28	Plus Bank	+		+				+		+				4	0
29	Powszechna Kasa Oszczędności Bank Polski	+	+	+	+	+	+	+	+	+	+	+	+	6	6
30	Raiffeisen Bank Polska	+	n		n		n	+	n	+	n		n	3	n
31	RBS BANK (Polska)		n		n		n		n		n		n	0	n
32	Santander Bank Polska	+	+	+	+	+	+	+	+	+	+	+	+	6	6
33	Santander Consumer Bank	+	+	+	+					+	+	+	+	4	4
34	SGB-Bank			+	+						+			1	2
35	Toyota Bank Polska		+	+	+		+				+		+	1	5

36	Volkswagen Bank Polska	+	+		+		+				+			1	4
TOTAL														106	94

Note: *"+" - existing profile; "n" - non-classified (the bank was not in operation during the year).*
Source: *Own elaboration based on the authors' research.*

It should be noted that of the 6 banks that do not have any identified profiles on social networks, 4 are mortgage banks with capital ties to other entities on the analyzed list. On their sites there are numerous links or redirects to the main entity's site (e.g., mBank Mortgage and mBank). Bank Nowy, on the other hand, is an institution created after the so-called forced restructuring of Podkarpacki Bank Spółdzielczy in Sanok, which was carried out in January 2020.

The Bank Guarantee Fund issued a decision to start the forced restructuring of Podkarpacki Bank Spółdzielczy (PBS), based in Sanok, due to the poor capital situation of PBS on January 17, 2020. The Fund took control of it and appointed an administrator. As reported at the time, the forced restructuring of the bank was carried out using a bridge bank - the New Bank of the BGF.

On the other hand, Plus Bank, among other things, on the subpages: about the bank; contact - in the footer of the page has social plug-ins for services: Facebook, NK.pl, Twitter, but they are inactive (the last two services work in a modified form). Mercedes-Benz Bank has links to 5 sites, but these are the same profiles used to communicate the car brand.

In terms of content on social profiles, there were no significant changes in the two periods analyzed. All banks' profiles on LinkedIn include their descriptions and various news related to HR issues, such as coverage of job fairs, information about internship programs, student internships, employer branding activities, etc. Most banks also showcase current job and/or internship/student placement opportunities.

The Facebook profiles identified in the survey are updated on a regular basis. They mainly present the following content: banks' offerings (e.g., promotional interest rates on savings accounts, loans, etc.), organizational issues (e.g., interruptions in access to e-banking), information on sponsorship activities or other activities related to corporate social responsibility, promotion of new forms of payment, security rules in e-banking, encouragement of regular savings.

As an activating element for Internet users, polls are most often used to provoke profile fans into discussion. In 2024, the profile of Bank Millenium was not classified, as it only shows a profile picture and in the background with the brand logo. This may suggest changes underway, as the profile was active in the previous period studied.

On the identified YouTube channels, the videos were grouped into thematic playlists. Among the predominant topics appeared: home finance, e-banking instructions, promotion (advertising spots familiar from TV, sometimes in an extended version), CSR and online security. 13 banks have their own profile on X. Due to the characteristics of this service, short messages dominate among the posts.

This service is more often used to communicate with investors, journalists than with customers, and many repetitions of Facebook content can be found. Quite often it is a tool within the press office. In the next social network analyzed - Instagram, 13 banks have their profiles in 2024. In the case of this service, it is important to bet on visual content, not very intrusive when it comes to commercial content, hence more often here you can find posts related to sponsorship or other CSR activities, contests, promotional offers, discounts from the bank's partners, etc.

Among the blogs run by banks, dedicated to the issues of banking, economics, management of the household budget, saving, etc., it is worth noting the PKO BP project School Blogs (szkolneblogi.pl) - a blog platform of school savings banks, where the idea of the program dedicated to schools is introduced, competitions are announced, curiosities from the "world of children's finances" are presented, which is an excellent example of the fight against potential digital-financial exclusion, through education from an early age.

ING has an interesting solution, which on the "ING Community" website, in addition to the blog, develops other activities such as a forum where (as the bank states) "we talk, submit ideas, help each other" - there is a space to establish contacts between customers, which can further be combined with the bank's concept of stationary outlets as places for co-working.

In 2024 of the 30 bank websites analyzed, 29 are responsive (except for Bank New), i.e. that they are designed so that their appearance and layout automatically adjusts to the size of the browser window, without harming the visual plane and the content presented, which is particularly important in the era when customers access the Internet using different devices (computer, tablet, smartphone). 24 has its own module for online banking. Mortgage banks and one bank dependent on a car brand (Mercedes) do not have it, which is certainly related to the specifics of its offerings, and thus the lack of need for an e-banking platform.

Table 4. *Information and communication technologies in banks*

Nazwa Banku	RWD	e-banking	Applications				Branch finder	Branch finder with filters	Contact				
				IOS	Android	APP Gallery			Online form	Call centre	IVR	Chat	Video chat

	2018	2024	2018	2024	2018	2024	2018	2024	2024	2018	2024	2018	2024	2018	2024	2018	2024	2018	2024	2018	2024	2018	2024
Alior Bank	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		
Bank BNP Paribas	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+		+	+	+		+
Bank BPH	+	+	+	+												+	+						
Bank Handlowy w Warszawie	+	+	+	+	+	+	+	+		+	+	+	+			+	+			+	+		
Bank Millennium	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Millenium Bank Hipoteczny	n	+	n		n		n			n		n		n		n	+	n		n		n	
Bank Nowy	n		n	+	n		n			n	+	n	+	n	+	n	+	n		n		n	
Bank Ochrony Środowiska	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+				+		
Bank Pocztowy	+	+	+	+		+		+		+	+	+	+	+	+	+	+	+	+	+	+	+	
Bank Polska Kasa Opieki		+	+	+	+	+	+	+		+	+	+	+	+	+	+	+		+	+	+	+	
Bank Polskiej Spółdzielczości	+	+	+	+	+	+	+	+		+	+	+	+		+	+	+	+	+				
Credit Agricole Bank Polska	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+		+		+
Deutsche Bank Polska		+	+	+						+		+		+	+	+	+	+					
DnB Bank Polska	+	+	+	+						+		+		+		+	+						
Euro Bank	+	n	+	n	+	n	+	n	n	+	n	+	n	+	n	+	n	+	n		n		n
FCA-Group Bank Polska	+	n		n		n		n	n	+	n		n	+	n	+	n		n		n		n
Getin Noble Bank/ VELO Bank	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+				
HSBC Bank Polska	+	n	+	n	+	n	+	n	n		n		n	+	n	+	n		n		n		n
Idea Bank	+	n	+	n	+	n	+	n	n	+	n	+	n	+	n	+	n		n		n		n
ING Bank Hipoteczny	n	+	n		n		n			n		n		n		n	+	n		n		n	
ING Bank Śląski	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			+	+		+
mBank Hipoteczny		+																					
mBank	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Mercedes-Benz Bank Polska	+	+								+	+		+	+			+						
Nest Bank	+	+	+	+	+	+	+	+	+	+		+		+		+	+	+	+			+	
Pekao Bank Hipoteczny		+														+	+						
PKO Bank Hipoteczny	+	+														+	+						
Plus Bank	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+						
Powszechna Kasa Oszczędności Bank Polski	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+				+
Raiffeisen Bank Polska	+	n	+	n	+	n	+	n	n	+	n	+	n	+	n	+	n		n	+	n		n
RBS BANK (Polska)	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
Santander Bank Polska	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+		+	+	+	+	+
Santander	+	+	+	+		+		+		+	+	+	+	+	+	+	+				+		

Consumer Bank																							
SGB-Bank	+	+	+	+		+		+		+	+	+	+	+		+	+						
Toyota Bank Polska	+	+	+	+		+		+		+	+		+	+	+	+	+		+		+		
Volkswagen Bank Polska	+	+	+	+		+		+	+	+	+					+	+		+				
TOTAL	28	29	27	24	19	20	19	20	9	27	21	23	20	25	18	30	29	8	14	9	13	5	6

Source: *Own elaboration based on the authors' research.*

Banks that provide services via the Internet mostly (20 entities) offer their customers mobile applications, prepared to provide banking services to customers using smartphones (for VW Bank and Toyota Bank, the applications are mainly used to authorize transactions in the transaction service). All of the offered applications were available for the most popular mobile operating systems today - Android and IOS, available on Google Play and App Store, and in 9 cases also on APP Gallery. The mortgage banks that do not have their own app are those that limit their activities in the Polish market (DnB, Deutsche Bank).

Over the years, there has been a significant change in the scope of app functionality. Originally, banking apps offered only impoverished transaction service functions. Today's banking apps allow, among other things, mobile and contactless payments (using services such as: BLIK, Apple Pay, Google Pay, Garmin Pay, Fitbit Pay, SwatchPay!); making transfers (your own, to another bank, ordinary and express, to a phone number); using additional services (buying public transport tickets, paying for parking, highways); logging in with a fingerprint or face scan (biometric logging), confirming transactions with PUSH notifications, and more.

The basic bank branch locator offers 21 analyzed entities on its site, of which in 20 cases it was possible to filter the search criteria into personal/corporate customer service, private banking, ATMs/deposits, among others. In the case of auto banks, the branch locator referred to finding dealers of a particular brand or brands whose products are financed by particular banks.

Banks give their current as well as potential customers a number of ways to contact them. In this case, the most popular form is the call center, which 29 of the banks analyzed currently have. For those who shy away from the call center, 18 banks offer contact forms, whereby in each case it was possible to send an inquiry with a request for feedback in the form of an email, and in several cases it was possible to leave one's phone number for a consultant to call back. 14 banks on their websites inform customers that they have implemented IVR - Interactive Voice Response - class systems (which is a significant increase over 2018), enabling interactive service to the caller. IVR can be said to have the functionality of an automated call center.

These banks post diagrams of their systems so that customers can see what they should dial in tone (a digit, a character) on the phone keypad to deal with the issue they are interested in. It is likely that most banks with call centers use IVR systems in some form, but they do not report this on their corporate website. A call would have to be made to each call center separately to verify the facts.

Currently, 13 banks offer their customers the opportunity to chat (up from 9 in the previous period), while 6 allow video chat, most of them also in sign language.

5. Conclusions, Proposals, Recommendations

Digitalization is now a phenomenon that encompasses almost every aspect of the lives and operations of both consumers and businesses. Especially for the latter, digital transformation has a huge impact not only on the image of the company (compared to its competitors), but most importantly on business development and making it more resilient and flexible.

Several banks also offer other ICT solutions. Among them are various loyalty programs (usually linked to the use of credit cards), a search engine for off-the-shelf cars (car banks). An interesting one is the Goodie application, created by Bank Millennium. It is a modern, free mobile application and website where users can find coupons, discounts, promotions, sales and discount codes. If a user is looking for a particular product in the daily deals newspaper of their favorite store, the Goodie app will find it at the best price at a store near them. With Goodie, you can compare prices in the newspapers of all major stores.

In addition, you can keep an eye on selected brands and receive push notifications with special offers and discounts, as well as mall events (Goodie, 2024). In the case of Alior Bank, you can make an appointment with an advisor either through the website or the booksy app (you have to choose the purpose of the visit, such as a mortgage, and book an appointment for a specific day and time), so you won't have to wait in line for an advisor. SGB Bank, in turn, has launched an interactive educational game designed to spread information about cooperative banking and its values, as well as increase financial competence.

Although the pandemic has caused a boom in e-banking, and the popularity of digital channels has jumped from 20 to 50 percent, consumers are already returning to their pre-lockdown habits. They still need to visit a land-based facility. This is because bank customers do not see social media as leading sources of financial information.

Customers like to have a variety of options to choose from, but they will always have their favorites. This applies to products and their providers, but also to the channels through which customers can contact or be contacted by their financial institution. This is what optichannel (Bangera and Bhat, 2023; Lewrick, 2022) in banking is all about. if a bank has an overwhelming number of customers using only mobile devices, that particular channel is refined and personalized to allow those customers to use it as often as possible - without, for example, having to visit a branch to consult an agent or verify their identity. On the other hand, this approach also means retaining physical branches in those areas where customers prefer traditional channels. In contrast to adopting omnichannel service, opting for optichannel requires data analysis.

However, in the overall assessment, thanks to their intensive involvement in the implementation of new technological solutions, Polish banks are classified among the most innovative banks in the world. Each of the sectors operating within the financial market in Poland recognizes the need for continuous development in terms of digitization, automation and implementation of new technological solutions that will make the offer directed to customers more attractive.

However, in order to effectively build customer engagement, it is not enough to create holistic experiences through various channels, it is also necessary to take a personalized approach and continuously optimize the actions taken. Combining optichannel and omnichannel approaches is the key to success, which can be achieved with the right banking solutions. Especially today, when the number of customers using mobile and digital banking is high (McKinsey, 2020; Feger, 2023). The strong emphasis placed on digitization with regard to customer contact has not been translated into an innovative approach to internal solutions and engaging with non-bank business partners.

In a virtual environment, there is no concept of "retention" - the digital space is always available, monitoring, analyzing and processing, and ultimately self-learning through the use of advanced artificial intelligence (AI) capabilities, which has a significant impact on targeting, segmenting and offering among all network users (Rahman *et al.*, 2023; Ribeiro and Reis, 2020). Banks in Poland, compared to other European countries, are characterized by a high degree of advancement in the field of innovation development and digitization.

Above-average activity can be seen in particular in the organization of sales of services and customer service using various types of digital platforms. In addition, an important aspect that sets Poland apart from the European competition is the Polish Blik payment system, which allows online and mobile payments, as well as ATM withdrawals without using a bank card. Most banks could offer a sign or real-time language interpreter function to facilitate the use of their services by deaf or foreigners.

6. Summary

The development of information and communication technologies (ICT) in the banking sector in Poland is playing a key role in transforming and streamlining banking processes and providing innovative financial services. In recent years, there has been a significant increase in the use of ICT by banks, both internally to streamline operations and externally to improve interactions with customers. This development is affecting a number of areas, including e-banking, data analytics, transaction security and fintech development.

The analysis showed that one of the most visible aspects of ICT use in banking is the development of online and mobile banking. Banks are offering increasingly sophisticated mobile applications that allow customers to manage their accounts, make transfers, mobile payments and monitor transactions in real time. This allows customers to conduct their banking operations conveniently and quickly from anywhere and at any time, which increases customer satisfaction and improves banks' competitiveness.

The survey showed that commercial banks operating in Poland are quite active in using social media to communicate with various stakeholder groups, mainly customers. The most common mistake that emerged was too many posts of a promotional nature, and not enough activities aimed at interacting with customers. It was also observed a regularity that banks, which direct their activities to a large extent to the individual customer, are definitely more active both in the area of social media and with the use of other presented modern tools that facilitate or differentiate the ways in which their customers communicate and use banking.

It is also worth noting that the development of information and communication technologies in the banking sector brings with it certain challenges. One of the main challenges is the need to ensure an adequate level of protection for customers' personal data and to prevent IT security breaches. In addition, with the increasing automation of banking processes, there is a risk of job losses for banking employees, which may have negative social and economic consequences.

References:

Ahmed, S., Majeed, M.E., Thalassinos, E.I., Thalassinos, Y.E. 2021. The impact of bank specific and macro-economic factors on non-performing loans in the banking sector: Evidence from an emerging economy. Journal of Risk and Financial Management, 14(5), 217.

Bajak, M., Spendel, Ł. 2022. Building Consumer Engagement and Loyalty while Traversing the Customer Journey in the Online Space. Scientific Papers of Silesian University of Technology – Organization and Management Series, Vol. 159, 39-52.

Bangera, S., Bhat, S. 2023. A Systematic Study of Application of Cognitive Intelligence in Mphasis–A Case Study. International Journal of Case Studies in Business. IT and Education (IJCSBE), 7(2), 360-380.

Budziewicz-Guźlecka, A., Woźniakowski, M. 2018. Social media in the marketing communication of Polish banks. European Journal of Service Management, 25, 23-29.

Budziewicz-Guźlecka, A., Woźniakowski, M. 2018. Information and communication technologies (ICT) in banking sector. European Journal of Service Management, 28, 39-48.

Cahaya, Y.F., Mursitama, T.N., Hamsal, M., Tjhin, V.U. 2023. Increasing e-loyalty of banking customers through customer trust and commitment. International Journal of Applied Economics, Finance and Accounting, 15(2), 96-104.

Drab-Kurowska, A., Budziewicz-Guźlecka, A. 2021. The Digital Post Ecosystem—Example of Poland in the Context of Research. Sustainability, 13(5), 2550.

EIB. 2021. Finance in Africa for green, smart and inclusive private sector development. European Investment Bank. DOI: 10.2867/38529. ISBN 978-92-861-5063-0.

Googie. 2024. Available at: https://goodie.pl/o-goodie.

KNF. 2024. Banki w formie spółek akcyjnych. Available at: https://www.knf.gov.pl/podmioty/Podmioty_sektora_bankowego/Banki_w_formie_spolek_akcyjnych.

McKinsey & Company. 2020. Customer preferences spur retail banking channel evolution. Available at: https://www.mckinsey.com/industries/financial-services/our-insights/banking-matters/customer-preferences-spur-retail-banking-channel-evolution.

Feger, A. 2023. Gen Z's mobile banking adoption is on the rise. Can banks earn its trust? E-Marketer. Available at: https://www.insiderintelligence.com/content/gen-z-mobile-banking-adoption-rise-banks-earn-trust.

Indayani, L., Hariasih, M., Prapanca, D., Mariani, A., Mahendra, D.P. 2023. Sustainability of Omnichannel in Banks with Online Service Strategy and Pricing Decisions. Indonesian Journal of Law and Economics Review, 18(3).

Lewrick, M. 2022. Design thinking for business growth: how to design and scale business models and business ecosystems. John Wiley & Sons.

Rahman, M., Ming, T.H., Baigh, T.A., Sarker, M. 2023. Adoption of artificial intelligence in banking services: an empirical analysis. International Journal of Emerging Markets, 18(10), 4270-4300.

Ribeiro, T., Reis, J.L. 2020. Artificial Intelligence Applied to Digital Marketing. In: Rocha, Á., Adeli, H., Reis, L., Costanzo, S., Orovic, I., Moreira, F., eds., Trends and Innovations in Information Systems and Technologies. WorldCIST 2020. Advances in Intelligent Systems and Computing. Cham, Springer, 158-169.

Rupeika-Apoga, R., Zaidi, S.H., Thalassinos, Y.E., Thalassinos, E.I. 2018. Bank Stability: The Case of Nordic and Non-Nordic Banks in Latvia. International Journal of Economics & Business Administration (IJEBA), 6(2), 39-55.

Thalassinos, E.I., Venediktova, B., Staneva-Petkova, D., Zampeta, V. 2013. Way of Banking Development Abroad: Branches or Subsidiaries. International Journal of Economics & Business Administration (IJEBA), 1(3), 69-78.

Thalassinos, E.I., Stamatopoulos, T.V. 2015. The Trilemma and the Eurozone: A Pre-announced Tragedy of the Hellenic Debt Crisis. International Journal of Economics & Business Administration (IJEBA), 3(3), 27-40.

Thalassinos, E.I., Pociovalisteanu, D.M. 2007. A Time Series Model for the Romanian Stock Market. European Research Studies Journal, 10(3-4), 57-72.