

DIGITAL TRANSFORMATION IN THE BANKING SECTOR: A PRE- AND POST- COVID-19 ANALYSIS

Alina Elena IONAȘCU

Ovidius University of Constanta, Constanta, Romania

School of Advanced Studies of the Romanian Academy, Bucharest, Romania

alina_cerchia@yahoo.com

Corina Aurora BARBU

Ovidius University of Constanta, Constanta, Romania

coribaru@yahoo.com

Abstract

The digitisation of the banking sector represents a key transformation in the financial industry, adapting to the demands and expectations of increasingly connected and technologically savvy customers. This transformation aims to deliver faster, more efficient and accessible banking services through digital technologies. Today, banks offer a wide range of digital solutions, including online and mobile banking, e-payments, virtual assistance and emerging technologies such as blockchain and artificial intelligence. These innovations have revolutionised the way customers interact with banks and bring significant benefits such as increased accessibility and personalised experiences. The study seeks to assess the attitudes and perspectives of individuals concerning the digital transition of the banking sector in Romania, both prior to and following the Covid pandemic. Drawing from research conducted personally before the pandemic, and a study by The Romanian Institute for Evaluation and Strategies, we aim to track the individuals' understanding and responses to emerging technologies in the banking sector. These insights will help to ascertain how the Covid-19 pandemic has altered their viewpoints and habits concerning the utilization of digital banking applications. Assessing the level of banking digitalisation is essential to understand the impact of this transformation and to identify directions for development and improvement in the banking industry. By addressing these challenges and future prospects, significant opportunities open up for innovation and improvement of banking services in the digital environment.

Keywords: digitalization, banking, Covid-19, services

1. INTRODUCTION

In today's digital age, online and mobile banking have become increasingly important in the financial industry (Werth et al, 2020;). Digital technology has emphasized a significant transformation in the way banks interact with their customers and provide financial services (Patapova et al., 2022; Versal et al, 2022). In particular, the COVID-19 pandemic has amplified the need for digital solutions in the banking sector, as social distancing and mobility restrictions have limited access to traditional services offered by bank branches (Yıldırım & Erdil, 2023; Doran et al., 2022).

Examining the attitudes of the youth towards digital banking services prior to the pandemic allows us to grasp the primary elements that shape their engagement with online and mobile applications provided by banking institutions. The gathered data sheds light on the areas banks need to concentrate on in order to elevate their level of digitalization, as well as to enhance the adoption rate among individuals.

In the subsequent segment of the analysis, this study emphasizes the significance and adoption of online and mobile banking amidst the COVID-19 pandemic crisis. By analysing data we explore the level of user satisfaction and their intention to use digital banking in the future.

During this time, online and mobile banking have conferred numerous advantages to clients in terms of financial inclusion (Demirgüç-Kunt et al., 2021). These platforms have facilitated account accessibility, streamlined payment processes, and simplified money transfers along with other fiscal transactions, all directly from mobile gadgets or personal computers, negating the necessity to physically visit a bank branch (Schipor & Duhnea, 2022). This provision has empowered users to handle their finances in a manner that is not only secure and swift but also convenient.

Online and mobile banking also offered customers a wide range of options and functionality, including account monitoring, access to transaction history, real-time notifications and online financial advice. These facilities

have enabled customers to be better informed, make more informed financial decisions and benefit from services tailored to their individual needs.

Preliminary results of our analysis show that users of online and mobile banking showed a significant level of satisfaction during the COVID-19 pandemic crisis. This underlines the importance and relevance of these services in the current context. Users appreciated the flexibility, accessibility and convenience offered by digital banking services and their level of satisfaction indicates an increased level of trust and use in the future.

With this research, we aspire to substantively contribute to the comprehension and advocacy of online and mobile banking, accentuating the merits and gains for customers amid the backdrop of the COVID-19 pandemic. Moreover, we intend to delve into the repercussions of our discoveries on the banking sector, proposing actionable insights and recommendations for the refinement and ongoing growth of digital banking.

Subsequent to the literature review, we delineate our research methodologies in depth, alongside the accrued results and ensuing discussions emanating from them. This approach facilitates a holistic understanding of the utilization, gratification, and significance of online and mobile banking in the digital era, particularly within the frame of the COVID-19 pandemic.

2. LITERATURE REVIEW

2.1. *Digital Transformation of the banking industry*

Digital transformation (DT) is a term used to describe changes in business activities, processes and skills through technology (i-SCOOP 2015; Rogers, 2016). The financial services sector has historically been acknowledged as one heavily dependent on digital technologies (Popa & Luca, 2022; Balkan, 2021). These technologies, which encompass information, computing, communication and connectivity technologies, play a crucial role in shaping and advancing the sector (Bharadwaj & Sawy, 2013). In financial services, digital technologies have revolutionised various aspects of operations, customer interactions and service delivery (Kraus, 2018). Banks and financial institutions have increasingly adopted digital solutions to streamline processes, increase efficiency and provide innovative services to customers (Ajupov et al., 2019).

The profound transformation of financial services is mainly driven by the evolution of mobile technologies, social media and the use of big data (Balkan, 2021; Pereira et al, 2022). These forces have fundamentally reshaped the way financial institutions interact with customers and conduct their daily operations. According to Kreitshtstein (2017), companies need to reimagine their customer value proposition and modernize their day-to-day operations to fully leverage the potential of digital technologies.

In the realm of service development and delivery, customer choices are primarily influenced by the net benefits derived from a service. This approach, substantiated by Mbama et al. (2018), underscores the criticality of innovation in aligning with customer anticipations. The assessment of a service by customers hinges on the cumulative benefits they reap, juxtaposed with the perceived value and associated costs. Innovation emerges as a pivotal component in augmenting these net benefits, bringing forth enhanced features, functionality, convenience, and financial savings.

Companies can carve a niche for themselves, present distinctive value propositions, and keep pace with evolving customer demands by persistently nurturing innovation and attuning to customer requisites (Cho et al., 2023). Incorporating customer perspectives actively into the innovation trajectory enables companies to craft solutions that are in sync with customer needs, thereby delivering substantial net benefits. At its core, fostering a customer-centric innovation culture is fundamental in securing a competitive edge, amplifying customer contentment, and guaranteeing the sustained prosperity of service offerings.

Within the digital transformation of banks, customer experience is a key pillar, according to Westerman et al. (2014). Machine learning and automation are two prevalent digital trends used to improve customer experience, as noted by Accenture Report (2023). Machine learning allows banks to provide personalized recommendations and targeted marketing by analyzing customer data. Automation refines procedures and diminishes manual intervention, liberating resources for more enriching customer engagements (Duan & Xiong,

2015). The integration of these technologies allows for more human-like interactions through chatbots and virtual assistants. By harnessing the capabilities of machine learning and automation, banks in the midst of digital transformation can deliver personalized, efficient, and seamless customer experiences, thereby boosting customer satisfaction and loyalty (Murinde et al., 2022, Omarini, 2017).

In addition, banks need to keep up with current developments in areas such as social media, data analytics, cloud computing and website optimisation. By adopting these technologies, banks can improve customer engagement, leverage data-driven insights, improve operational efficiency and enhance their digital presence.

As banks go through digital transformation and digitization, they face several challenges that need to be addressed. These challenges include reduced customer loyalty, lower profit margins, the emergence of new technologies, increased regulatory requirements, and the need for customer-centric approaches (Cziesla, 2014; Dapp, 2017; Pousttchi and Dehnert, 2018; Dehnert and Schumann, 2022). The rapid pace of technological change requires banks to develop new business models. They need to adapt to the evolving digital landscape and explore innovative ways to deliver value to customers. In addition, employee engagement in the digital transformation process is crucial. Banks should provide training and development opportunities to ensure that employees can adapt to the changes taking place both internally and externally (Schuchmann and Seufert, 2015; Stanciu, 2017). However, the assimilation of these new technologies by the population is a matter that necessitates the involvement of not just banks, but also the government or other interested institutions.

2.2. Digital Transformation of the banking industry – a COVID-19 perspective

The COVID-19 pandemic has accelerated the importance of digital transformation in banking and other industries. Banks have recognised the need to invest more in digitisation to meet the growing demand for branchless banking.

In response to the pandemic, banks have stepped up their efforts to introduce new digital tools and processes. According to Deloitte (2020), in 2020, banks saw significant increases in the adoption of various digital initiatives. For example, there was a 40% increase in the implementation of contactless payments, a 35% increase in the online digital products usage, a 25% increase in appointment bookings through digital channels and a 23% increase in the use of digital methods of identity verification.

Digital transformation is very significant in the banking sector, reflecting its importance across industries (Coryanata et al, 2023). Technological innovations and global developments have led to substantial changes in the banking sector. Banks have embraced digital technologies to streamline operations, improve customer experiences and offer innovative products and services. The shift to online and mobile banking has given customers convenient access to banking services anytime, anywhere. Data analytics and artificial intelligence have enabled banks to gain valuable insights, tailor offerings and improve decision-making. Collaboration between banks and fintech companies has fostered the development of innovative solutions (Omarini, 2017).

Digital transformation is now essential for banks to remain competitive, meet customer expectations and drive growth in the digital age. Moreover, younger clients are more likely to change more often the banks that they are using as they do compare the services more often (Clemes, Gan, & Zhang, 2010). As Windasari et al.(2022) revealed in their study, youngers are considered to have “high curiosity and low uncertainty avoidance and like to experience new things”. As the level of usage of digital banking services by the young generation is growing, banks should take into consideration the social influence which is important and affecting customers` intention to use these new technologies (Windasari et al, 2022).

Another advantage of digitalization is its potential to enhance financial inclusion by extending access to banking services to underserved communities. This can consequently foster economic growth and alleviate poverty (Gabor & Brooks, 2017).

3. RESEARCH METHODOLOGY

For this analysis we used two research studies. The first research on digital transformation before the COVID 19 pandemic was self-conducted to analyse the level of digitisation and integration of new technologies in the banking industry. The second research is based on the study conducted by The Romanian Institute for Evaluation and Strategies (IRES) during the 2020 emergency. The primary rationale for selecting a two-step analysis is to more effectively underscore the patterns and tendencies pertaining to behaviors and perceptions among individuals concerning digital innovations utilized in banking transactions. Even though the datasets are not derived from identical samples, they exhibit a consistent trend. Furthermore, the subsequent analysis (post-Covid-19) also categorizes the sample based on age groups, specifically 18 to 35 years.

3.1. Research on digital transformation in banking in the pre-Covid- 19 era

In the initial study that supplied the data under analysis, the research method encompassed a sample of 467 validated responses out of a total of 482 collected responses. Responses that did not satisfy the age criteria were excluded. The age limitation of respondents was considered for the analysis, as young millennials, referred to as Generation Y, aged 19-39, are the ones who use new technologies in the bank the most, they represent the future and are representative for our research. Data collection was carried out using the CAWI (Computer Assisted Web Interviewing) technique and took place during the period: May-June 2019, lasting approximately 2 months, and statistical data processing was carried out in IBM SPSS Statistics 2.2 software.

The data reveals that the mean age of respondents participating in the questionnaire is approximately 25.73 years, with a standard deviation of roughly ± 5.3 years. The mode, or most frequently occurring age, stands at 21 years, indicating that this was the most prevalent age among respondents. The age range spanned from a minimum of 18 years to a maximum of 39 years. Furthermore, the skewness coefficient is registered at 0.85, and the kurtosis coefficient is noted to be -0.138. These statistics substantiate the notion that age functions as a normally distributed numerical variable in this dataset, thus permitting its inclusion in parametric statistical examinations.

The age distribution of the respondents is delineated as follows: A fraction of 5.14% falls below 20 years of age, 47.97% are within the age bracket of 20-25 years, 29.34% belong to the 26-31 years category, 10.06% are aged between 32 and 36 years, and the remaining 7.49% are within the age range of 36-39 years. The studied sample includes subjects of both genders, with male representatives constituting 22.9%, while female representatives make up 77.1%.

To better understand the population, we will continue to look at demographic data concerning their background, education level, and income level. The majority of those who responded to the questionnaire come from urban areas (77.5%), and only 22.5% come from rural areas. Almost half of the respondents (49%) have completed undergraduate studies, 32.1% are master's degree holders, 5.8% have postgraduate studies, and 4.3% have doctoral degrees. 8.8% of the study participants have only completed secondary education. The distribution of respondents based on their monthly income was segmented into four approximately equal groups: 26.3% who have no income, 21.4% with incomes below 2000 lei, 28.3% with incomes between 2000 and 4000 lei, and 24% with incomes exceeding 4000 lei per month.

The questionnaire comprises 29 questions related to the attitudes and perceptions of young individuals in Romania regarding new technologies in the online banking sphere, with 7 questions designed to profile the respondents. We have selected only 6 relevant questions from this questionnaire for our study. The initial three hypotheses explore the correlations and interconnections between the usage level and factors such as speed, utility, and ease of use. The final hypothesis examines the relationship between the perceived transaction security experienced by customers while utilizing internet banking. The other questions present in the questionnaire are not pertinent to this study and are components of prior researches. Thus, the hypotheses formulated are the following:

Hypothesis 1: The willingness to use internet banking is connected to the service's speed.

Hypothesis 2: Intention to use internet banking is influenced by individuals' perceptions of the service's utility.

Hypothesis 3: Intention to use internet banking is related to ease of use of internet banking.

Hypothesis 4: The usage of internet banking is related to the security offered by the banks.

We carried out statistical analyses on the gathered data to pinpoint significant trends, correlations, and connections pertaining to digital banking usage. By employing methods such as descriptive analysis, correlation assessments, and bivariate Chi-Square tests, we were able to delve into and interpret the findings. These analytical endeavors facilitated a more profound comprehension of user satisfaction degrees and their prospective inclination towards utilizing digital banking in the Pre-Covid era.

3.2. Results

TABLE 1 - INTENTION TO USE INTERNET BANKING (SPEED)

Please agree or disagree with the following statements [Through the use of internet banking, I can access the bank's services in a much shorter amount of real time.]						
Please agree or disagree with the following statements [In the future, I will carry out more transactions via Internet Banking].	partial agreement	full agreement	partial disagreement	total disagreement	neither agree nor disagree	Total
partial agreement	44	46	0	0	7	97
full agreement	13	227	0	1	0	241
partial disagreement	4	5	11	2	5	27
total disagreement	3	2	2	8	0	15
neither agree nor disagree	25	29	0	2	31	87
Total	89	309	13	13	43	467

Chi-Squared Tests			
	Value	df	p
X ²	524	16	2e -101
N	467		

In Table 1 we are testing Hypothesis 1 The willingness to use internet banking is connected to the service's speed. Since $p < 0.05$, the hypothesis is accepted. The bivariate Chi-square test (χ^2) showed a significant association between the two variables ($\chi^2 = 524$; $df = 16$, $p < 0.001$). The large value of χ^2 indicates that the correlation is strong. Specifically, there is a notable statistical variation indicating that the quicker young individuals can access the bank's services, the more frequently they utilize the service, subsequently conducting a greater number of transactions through the internet banking application. Utilizing internet banking allows customers to access the bank's services in a significantly reduced timeframe compared to traditional banking methods. Transactions and services that might have taken a considerable amount of time can now be accomplished almost instantaneously, without the need to visit a bank branch. This kind of real-time access not only saves time but also adds a layer of convenience, making it easier to manage finances effectively and efficiently at any time, from anywhere.

TABLE 2 – INTENTION TO USE INTERNET BANKING (USAGE)

Please agree or disagree with the following statements [Internet Banking is useful]						
Please agree or disagree with the following statements [In the future, I will carry out more transactions via Internet Banking].	partial agreement	full agreement	partial disagreement	total disagreement	neither agree nor disagree	Total
partial agreement	44	45	0	0	8	97
full agreement	16	221	0	1	3	241
partial disagreement	4	5	9	1	8	27
total disagreement	3	2	2	7	1	15
neither agree nor disagree	19	33	1	1	33	87
Total	86	306	12	10	53	467

Chi-Squared Tests			
	Value	df	p
X ²	459	16	2e -87
N	467		

In Table 2 Hypothesis 2 is tested (Intention to use internet banking is influenced by individuals' perceptions of the service's utility). Since $p < 0.05$, the hypothesis is accepted. The bivariate Chi-square test (χ^2) showed a significant association between the two variables ($\chi^2 = 459$; $df = 16$, $p < 0.001$). More specifically, there exists a statistically significant disparity indicating that the perceptions of young people regarding the service influence their frequency of internet banking usage. Those who deem the service beneficial are more inclined to utilize it in the future. When people find that online banking platforms offer them convenience, streamlined processes, and valuable features, they are more likely to increase their reliance on these services over time. Moreover, they may even advocate for it to others, thereby expanding its adoption within the larger community. This favorable outlook and ensuing growth in usage could potentially spur further developments and innovations in the industry, enhancing the practicality and features available to customers. Consequently, it is imperative for banks to persistently focus on improving and augmenting the capabilities and services of their online platforms to cater to the changing demands and anticipations of their clientele.

TABLE 3 - INTENTION TO USE INTERNET BANKING (USER-FRIENDLY)

Please agree or disagree with the following statements [In the future, I will carry out more transactions via Internet Banking].	Please agree or disagree with the following statements [Internet Banking is easy to use]					Total
	partial agreement	full agreement	partial disagreement	total disagreement	neither agree nor disagree	
partial agreement	44	38	2	2	11	97
full agreement	37	199	2	0	3	241
partial disagreement	0	4	12	1	10	27
total disagreement	0	1	3	9	2	15
neither agree nor disagree	23	24	4	6	30	87
Total	104	266	23	18	56	467

Chi-Squared Tests			
	Value	df	p
X²	411	16	2e-77
N	467		

Table 3 is testing Hypothesis 3: Intention to use internet banking is related to ease of use of internet banking. The χ^2 value is 411, and the p-value is very small, with 77 decimal places < 0.001 . The correlation is strong if the chi-square value is large. The p-value is < 0.05 which means that the result is not random and there is correlation. We note a positive correlation where an increase in a customer's perception of the ease of learning to use the service correlates with a higher likelihood of future use by the customer. Thus, we accept the hypothesis that intention to use internet banking is related to ease of learning internet banking. A user-friendly interface motivates a larger number of customers, including those who might not be adept with technology, to embrace internet banking services. A service that is straightforward and easy to use generally results in greater customer satisfaction, potentially fostering higher retention rates and favorable referrals. A platform that prioritizes ease of use facilitates swift and hassle-free transactions or information retrieval for customers, saving them time and minimizing frustration. Furthermore, an intuitive and easily navigable platform can lessen the frequency of queries and complaints directed at customer service, consequently lowering the bank's operational expenses.

TABLE 4 - DEGREE OF USE OF INTERNET BANKING (SECURITY)

Which of the electronic services offered by the bank do you use? [internet banking]	Please agree or disagree with the following statements [The use of these technologies gives me security in my transactions].					Total
	partial agreement	full agreement	partial disagreement	total disagreement	neither agree nor disagree	
Sometimes	45	26	15	4	23	113
not at all	20	11	16	13	27	87
from	62	44	7	2	17	132
very often	51	67	6	0	11	135
Total	178	148	44	19	78	467

Chi-Squared Tests			
	Value	df	p
X²	101	12	3e-16
N	467		

Since $p < 0.05$, the hypothesis number 4 is accepted (Table 4). The bivariate Chi-square test (χ^2) showed a significant association between the two variables ($\chi^2 = 101$; $df = 12$, $p < 0.001$). More precisely, a statistically significant distinction is observed, indicating that an increase in the level of security provided by new banking technologies correlates with a heightened usage of internet banking services among young individuals. Customers are more inclined to utilize and have faith in a digital banking platform when the security of their data and transactions is guaranteed. Trust serves as a cornerstone in financial relationships. By safeguarding the security of digital banking platforms, users are shielded from potential financial setbacks that might arise from fraudulent activities, phishing scams, or identity theft.

TABLE 5 – SUMMARY OF HYPOTHESIS TESTING

H1: The willingness to use internet banking is connected to the service's speed.	Accepted hypothesis	The quicker young individuals can access the bank's services, the higher the likelihood that they will utilize internet banking, consequently engaging in a greater number of transactions through this platform.
H2: Intention to use internet banking is influenced by individuals' perceptions of the service's utility.	Accepted hypothesis	Young individuals who perceive internet banking as beneficial are more likely to increase its usage in the future..
H3: Intention to use internet banking relates to ease of use of internet banking	Accepted hypothesis	The more straightforward a customer finds a service to use and comprehend, the higher the probability they will utilize it in the forthcoming period.
H4: The degree of use of internet banking is related to the security provided	Accepted hypothesis	The higher the level of security provided by modern banking technologies, the more prevalent the use of internet banking becomes among young people.

Table 5 summarizes the hypothesis testing. As we can see all the hypothesis were accepted. As banks progressively shift from traditional to digital channels, saving time and ease of use can play a significant role in encouraging customers to transition smoothly to digital platforms without hesitation. Nevertheless, protection of personal information is important for users as digital banking involves the handling of sensitive personal information, including financial details. Adequate security measures are necessary to prevent unauthorized access and data breaches.

3.3. Research on digital transformation in the banking sector during the Covid 19 pandemic

The Romanian Institute for Evaluation and Strategies (IRES) carried out a survey from May 20-21, 2020, involving 1033 participants who were aged 18 and older. This study holds significance as it was conducted during the lockdown period, a time when individuals altered their perceptions and behaviors, increasingly relying on digital resources. We deemed this study to be pertinent to our earlier research (conducted pre-Covid 19 analysis), as it helps to accentuate the embrace of digitalization by Romanians more effectively. While we utilized their data, we revamped and restructured their graphics to underscore the extent of digital banking services usage.

By using the data from this survey, we had a solid basis to draw relevant conclusions about users' behaviour and their perception of digital banking in the context of the COVID-19 pandemic crisis.

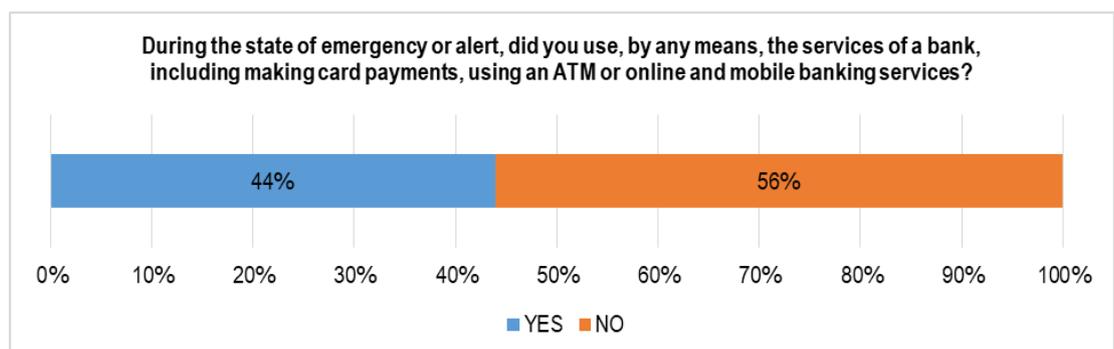


FIGURE 1 - USE OF BANKING SERVICES DURING EMERGENCY OR ALERT STATUS

Source: <https://ires.ro/>

DIGITAL TRANSFORMATION IN THE BANKING SECTOR: A PRE- AND POST- COVID-19 ANALYSIS

Figure 1 shows us that during the period of emergency or alert state, 44% of the survey participants availed themselves of bank services, encompassing activities like card payments, utilizing ATMs, or engaging with online and mobile banking platforms (Figure 1). This indicates that a notable portion of the populace favored digital means for conducting their banking transactions over traditional in-branch operations.

A few probable explanations for this preference exist. Initially, a substantial number of individuals chose to circumvent direct physical interactions amidst the phases of societal restrictions and isolation. The adoption of digital banking platforms, including online and mobile banking, furnished them with the convenience of managing their financial affairs securely and conveniently through their personal devices.

In addition, the sphere of digital banking has witnessed swift advancements in recent times, presenting an array of features and functionalities including, but not limited to, funds transfers, utility bill payments, and balance inquiries. This heightened level of user-friendliness and accessibility possibly facilitated the augmented engagement with digital banking facilities amidst the periods of emergency or alerts.

Contrastingly, 56% of the participants indicated abstaining from using banking services throughout this duration. The underlying reasons for this choice could be multifaceted. A segment of respondents might have been precluded from accessing digital banking owing to reasons such as technological unfamiliarity or restricted internet access. Meanwhile, others might retain a preference for the traditional banking avenues or place greater trust in face-to-face interactions at bank premises.

To sum up, the uptake of banking services amidst the emergency or alert phases experienced a substantial surge in the digital realm, albeit a fraction of the community either refrained from adopting these services or lacked the requisite access. It remains critical for banking establishments to persist in evolving and proffering secure and user-friendly digital solutions, thereby enabling a broader spectrum of users to reap the rewards of the ongoing digital metamorphosis in the banking sector.

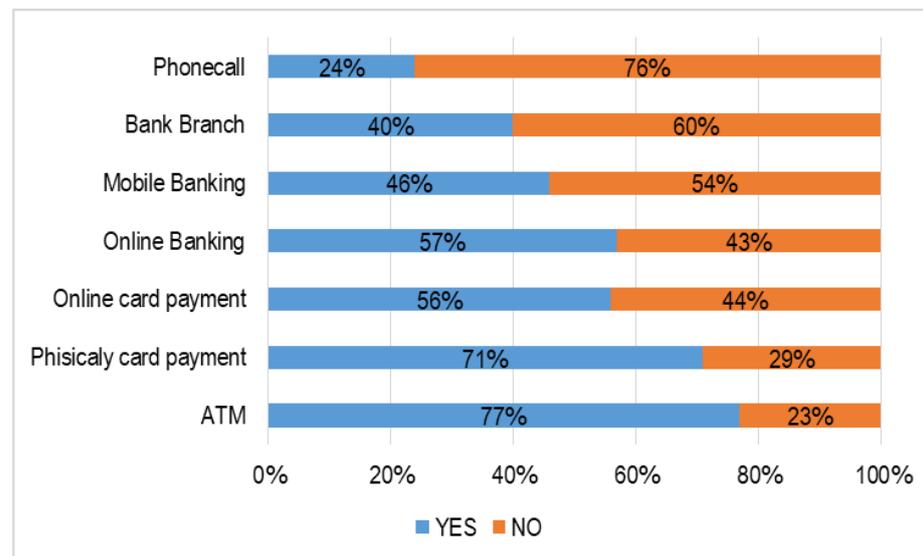


FIGURE 2 - TYPES OF BANKING SERVICES USED DURING AN EMERGENCY OR ALERT STATE

Source: <https://ires.ro/>

Figure 2 is analysing the percentages obtained from the survey. Certain conclusions can be drawn regarding the use of banking services during the crisis caused by the COVID-19 pandemic. The ATM was one of the most used ways of accessing banking services, with 77% of respondents saying they used this service. This suggests that ATMs offered a convenient and secure alternative for obtaining cash or conducting financial transactions in a self-serve manner. This result is in line with the general trend of reducing the use of cash in favour of electronic payments.

DIGITAL TRANSFORMATION IN THE BANKING SECTOR: A PRE- AND POST- COVID-19 ANALYSIS

Physical card payments were made by 71% of respondents, indicating a significant use of this payment method during the crisis. The use of physical cards was preferred for purchases in shops and merchants, offering a convenient and secure option for commercial transactions.

As for online card payments, 56% of respondents used this method. This shows a significant increase in online payments, either through merchant websites or online services or through payment apps. This trend can be attributed to the avoidance of physical contact and the encouragement of digital payments during the pandemic.

Online banking services were used by 57% of respondents, showing that the majority chose to manage their accounts and conduct banking transactions via internet banking platforms offered by banks. This reflects an adaptation to the digital options offered by banks and a preference for managing finances in an online and convenient way.

However, the use of mobile banking was lower, with only 46% of respondents saying they used this option. This result may be influenced by the level of familiarity and comfort with using mobile apps for banking. However, this trend is likely to change in the future, given the general increase in smartphone and mobile app use.

Interestingly, only 40% of respondents used physical interactions in bank branches, indicating a significant preference for digital options. This may be attributed to the desire to avoid physical contact and personal interactions during the health crisis.

Use of the banks' telephone service was generally low, with only 24% of respondents saying they used this option. This result may indicate a greater preference for digital banking or a lack of awareness of this way of communicating with banking institutions.

In conclusion, the results of this survey suggest a significant increase in the use of digital banking services during the COVID-19 pandemic crisis. The use of ATMs, physical card payments, online banking and online card payments was predominant. However, there are still opportunities for growth in the use of mobile banking and telephone communication with banks. These results reflect the need for adaptation and digital transformation in the banking sector, which is becoming increasingly important in the context of the pandemic and the demands of social distancing.

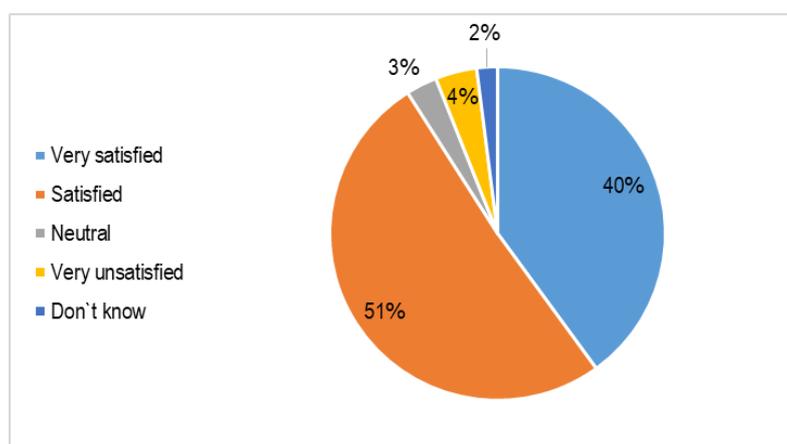


FIGURE 3 - LEVEL OF SATISFACTION WITH THE FUNCTIONALITY OF BANKING SERVICES DURING THE COVID-19 CRISIS
Source: <https://ires.ro/>

In reviewing the satisfaction levels concerning the functionality of banking services amidst the COVID-19 pandemic crisis (Figure 3), it appears that a substantial majority of the respondents were content with the offerings provided by the banks.

Initially, 40% of the respondents expressed being highly content with the operational efficacy of banking services throughout the crisis. This response seems to be a favorable appraisal of the banks' performance, particularly concerning how they managed the adversities precipitated by the pandemic. These respondents

DIGITAL TRANSFORMATION IN THE BANKING SECTOR: A PRE- AND POST- COVID-19 ANALYSIS

likely admired the banks' capacity to sustain functionality and afford crucial financial services during this turbulent timeframe.

Furthermore, 51% of respondents conveyed a fair level of satisfaction regarding the operation of banking services during the critical period. This perspective hints at a general approval of the banks' modification strategies to cater to customer requisites amid the pandemic. It is plausible that this portion of respondents valued the banks' endeavors to introduce digital alternatives and guarantee a moderate degree of service consistency in a fluctuating setting.

Nonetheless, a minor segment of respondents (3%) expressed considerable discontent with the banking services during this span, and 4% reported being extremely dissatisfied. Various factors could underlie this dissatisfaction, including challenges in utilizing or accessing digital amenities, transaction processing delays, or perceived insufficient support from the banks.

It merits mention that a negligible proportion (2%) of the respondents either remained unsure or abstained from responding to the satisfaction query. This could possibly stem from insufficient knowledge or constrained banking interactions at that juncture.

Despite the prevalent satisfaction with banking services' operations amidst the COVID-19 induced crisis, it remains imperative for banking institutions to heed the critiques and apprehensions of the disgruntled clientele, fostering further enhancements in the services rendered. Insights garnered from this epoch could aid in the formulation and execution of more adept and resilient strategies in the future banking landscape.

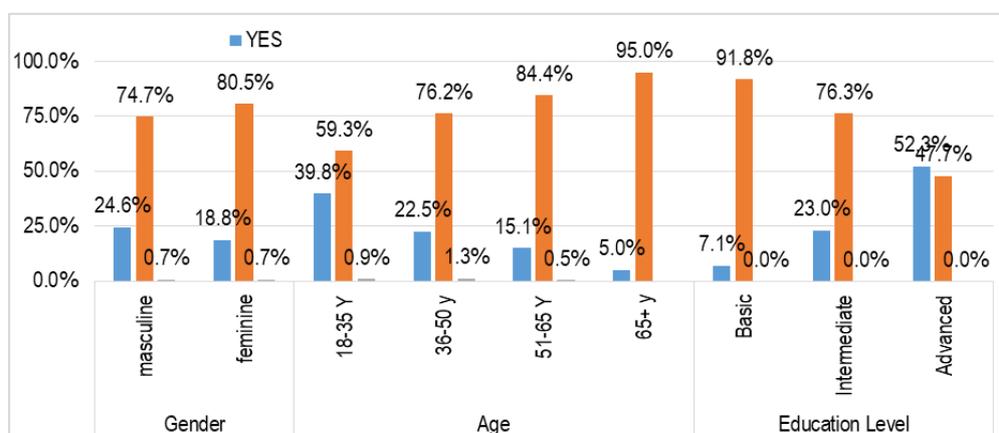


FIGURE 4 - STATISTICAL-DEMOGRAPHIC ANALYSIS OF ONLINE BANKING USER BEHAVIOUR

Source: <https://ires.ro/>

Turning our attention to the insights delineated in Figure 4, we can glean pertinent inferences regarding the patronage of online banking facilities, segmented by demographic characteristics like gender, age, and educational attainment.

Gender-wise, the data showcases a notable divergence in the usage of online banking, with a more substantial fraction of male respondents (24.6%) engaging with these services as opposed to their female counterparts (18.8%). Various elements could be steering this variance, encompassing individual predispositions, technological acquaintance levels, and accessibility to digital banking platforms. Age-wise, the data divulges a predilection for online banking services among the younger populace (18-35 years), with a significant 39.8% availing themselves of these services. This inclination seems to taper with ascending age brackets, noted at 22.5% in the 36-50 years bracket, 15.1% in the 51-65 years category, and dwindling further to 5.0% among individuals exceeding 65 years. This trend likely mirrors the heightened tech-savviness of the younger generation and their penchant for digital banking solutions.

Looking at educational attainment, we see that the use of online banking increases with the level of education. Respondents with higher education have the highest percentage of online banking usage (52.3%), followed by those with secondary education (23.0%) and those with elementary education (7.1%). This can be attributed to the higher level of familiarity and accessibility to technology among those with higher education.

DIGITAL TRANSFORMATION IN THE BANKING SECTOR: A PRE- AND POST- COVID-19 ANALYSIS

Overall, the majority of respondents do not use online banking services, regardless of the demographic characteristics analysed. The percentages recorded for those who do not use online banking services are relatively high, such as 74.7% male, 80.5% female, 59.3% in the 18-35 age group and 76.2% in the 36-50 age group. This may indicate both a preference for traditional banking methods and a possible lack of familiarity or accessibility to online banking.

For the small percentage of respondents who did not respond (0.7% overall), it can be attributed to uncertainty or lack of information about using online banking.

Thus, the results show significant variations in the use of online banking services according to gender, age and level of education. Understanding these differences can help banking institutions to develop appropriate strategies to promote the use of online banking services and meet the diverse needs and preferences of customers.

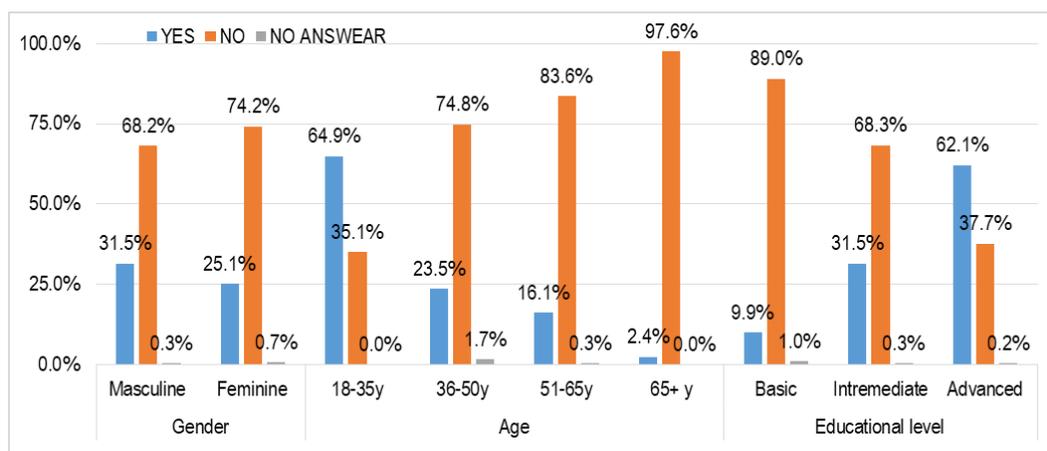


FIGURE 5 - STATISTICAL-DEMOGRAPHIC ANALYSIS OF MOBILE BANKING USER BEHAVIOUR

Source: <https://ires.ro/>

By analyzing the data presented (Figure 5) on the use of smartphone banking, mobile banking, according to demographic variables such as gender, age and education level, we can deduce significant conclusions about the adoption and use of these services.

In terms of gender, we find that men show more extensive use of smartphone banking, mobile banking, compared to women. The percentage of usage among men is 31.5%, while among women it is 25.1%. This discrepancy may be influenced by several factors, including individual preferences, level of familiarity with technology and accessibility of mobile banking.

Looking at the age group, we find that the use of smartphone banking, mobile banking, is more prevalent among younger respondents (18-35 years), with a usage rate of 64.9%. As age progresses, the percentage of usage decreases in the age group 36-50 years (23.5%), 51-65 years (16.1%) and among people over 65 years (2.4%). This tendency may be ascribed to the younger population's increased familiarity and comfort with utilizing mobile technology, whereas the older generation might have a preference for conventional banking approaches.

In terms of education level, we see that the use of smartphone banking, mobile banking, increases with the level of education. Respondents with higher education have the highest percentage of mobile banking usage (62.1%), followed by those with high school education (31.5%) and those with elementary education (9.9%). This result suggests that higher levels of education are associated with greater familiarity and accessibility to smartphone technology and mobile banking.

Overall, the majority of respondents do not use smartphone banking, mobile banking, regardless of the demographics analysed. The high percentages for those who do not use such services (68.2% male, 74.2% female, 35.1% in the 18-35 age group and 74.8% in the 36-50 age group) may indicate both a preference for traditional banking methods and a possible lack of familiarity or accessibility to mobile banking.

For the small percentage of respondents who did not respond (0.3% overall), this can be attributed to uncertainty or lack of information about the use of mobile banking services.

In conclusion, understanding the differences in the use of smartphone banking, mobile banking, by gender, age and education level can be critical for banking institutions in developing and adapting their services according to the diverse needs and preferences of different demographics.

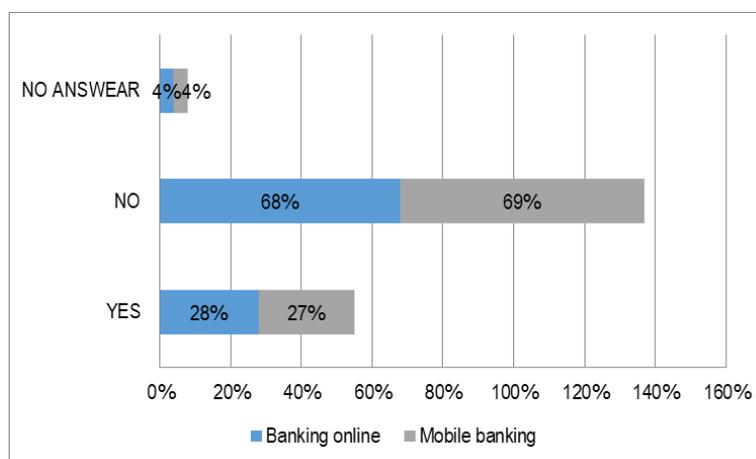


FIGURE 6 - INTENTION TO USE ONLINE AND MOBILE BANKING IN THE FUTURE

Source: <https://ires.ro/>

By analysing the data presented in figure 6 on the intention to use online and mobile banking services in the future, we can see that there is a significant proportion of respondents who show no interest in using these services.

Regarding online banking, our data indicates that 28% of survey participants plan to utilize this facility in the future, contrasting with the 68% who have no intention to do so. Furthermore, 4% remained indecisive, failing to specify their future stance on this service. These statistics reveal a substantial segment of users disinclined towards embracing online banking in the forthcoming period.

Similarly, when it comes to mobile banking, we observe a comparable trend, with 27% expressing an intention to use this service down the line, and 69% rejecting this notion. Additionally, a 4% fraction of the sample gave no definitive response regarding their prospective usage of mobile banking.

The reluctance towards adopting online and mobile banking avenues could stem from diverse causes. A portion of the respondents might lean towards the traditional banking paradigms, placing higher trust in direct interactions with bank personnel. Conversely, some could harbor apprehensions regarding the security and privacy encompassing their personal information during online transactions. Moreover, the extent of ease and acquaintance with digital platforms can potentially sway the choice to employ these services.

These insights can serve as a vital resource for banking entities aiming to enhance and advocate their online and mobile banking provisions. Grasping the underlying motivations and reservations of users can facilitate the formation of strategies that address these aspects, creating offerings that align with their preferences and anticipations. Concurrently, it is crucial to bolster the transparency, security, and user-friendliness of these services to foster trust and encourage a transition to digital banking in times ahead.

4. DISCUSSIONS AND CONCLUSIONS

From the evaluations and existing literature, it is evident that the digital revolution in the banking sector has profoundly influenced the manner in which financial services are provided and utilized. Digital advancements have reshaped banking procedures, the nature of customer engagements, and the delivery of services. (Bharadwaj & Sawy, 2013). Specifically, mobile technologies, social media, and big data have been pivotal in

transforming the banking sector and helping banks adapt to evolving customer expectations (Kreitshtstein, 2017).

The relationship between young individuals' views on digital banking offerings and their usage frequency indicates that several elements, including speed, utility, user-friendliness, and provided security, significantly affect their adoption rate. Hence, banks should concentrate on enhancing these aspects moving forward. Concurrently, the Covid-19 pandemic has notably altered the viewpoints of digital banking consumers. Undoubtedly, the COVID-19 pandemic has markedly hastened the transition to online banking. In the face of social distancing protocols and a considerable amount of bank branches reducing their service hours, people have gravitated towards online banking platforms as a more secure and expedient option. This movement is not just indicative of a behavioral shift brought about by necessity but also mirrors the escalating trust and dependence on digital platforms for regular financial dealings. It is anticipated that this surge in the utilization of online banking will persist, as individuals grow increasingly comfortable with the amenities and effectiveness it provides. Although customers were compelled to increasingly utilize the digital solutions provided by banks, they should not overlook the other factors that influence their choice to use internet banking, as highlighted in the research conducted prior to the Covid era.

To conclude, the digital shift in the banking sector presents substantial prospects as well as hurdles for the deployment of online and mobile banking. Grasping the elements that dictate the acceptance and rejection of these services can steer banks in formulating suitable strategies to endorse and cater to client necessities. Enhancing security measures, devising personalized assistance, and enlightening customers can significantly contribute to fostering the adoption of digital banking while elevating customer contentment.

REFERENCES

- Abbott, M. (2020, September 20). The four tech trends for banks to outmaneuver uncertainty. Accenture. Retrieved July 21, 2023, from <https://bankingblog.accenture.com/four-tech-trends-banks-outmaneuver-uncertainty>
- Ajupov, A.A., Ahmadullina, A.A., Belyaev, R.M., & Sizova, A.I. (2019). Assessment of the Level of Development of Digital Technologies in the Banking Sector. *HELIX*.
- Balkan, B. (2021). Impacts of Digitalization on Banks and Banking. In: Bozkuş Kahyaoğlu, S. (eds) *The Impact of Artificial Intelligence on Governance, Economics and Finance, Accounting, Finance, Sustainability, Governance & Fraud: Theory and Application*. Springer, Singapore, 1, 33-50.
- Bharadwaj, A., & Sawy, O. A. (2013). Digital Business Strategy: Toward a Next Generation of Insights. *MIS Quarterly*, 37(2), 471-482.
- Cho, S.; Lee, Z.; Hwang, S.; Kim, J. (2023). Determinants of Bank Closures: What Ensures Sustainable Profitability in Mobile Banking? *Electronics*, 12, 1196. <https://doi.org/10.3390/electronics12051196>
- Clemes, M. D., Gan, C., & Zhang, D. (2010). Customer switching behaviour in the Chinese retail banking industry. *International Journal of Bank Marketing*, 28(7), 519-546.
- Coryanata, I., Ramly, E. H., Puspita.,L.M.N. Halimatusyadiah, H. (2023). Digitalization of Banking and Financial Performance of Banking Companies. *International Journal of Social Service and Research*, 3(2), 366-371.
- Cziesla, R. (2014). Challenges of digital transformation in banking and finance. *Journal of Internet Banking and Commerce*, 19(1), 1-13.
- Dapp, T. (2017). Strategic implications of digitalization in the banking sector: A literature review. *International Journal of Bank Marketing*, 35(6), 904-926.
- Dehnert, J., & Schumann, M. (2022). Digital transformation in banking: A systematic literature review and directions for future research. *Electronic Markets*, 32(1), 13-32.

- Deloitte. (2020). Institute of International Finance and Deloitte Realizing the digital promise. COVID-19 catalyzes and accelerates transformation in financial services, Retrieved on July 20, 2023, from https://www2.deloitte.com/content/dam/Deloitte/pt/Documents/financial-services/realizing-the-digital-promise/01_Realizing-the-digital-promise_COVID-19-catalyzes-and-accelerates-transformation.pdf
- Demirgüç-Kunt, A., Klapper, L., Singer, D. & Ansar, S. (2021). Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. Findex Data Base. World Bank, retrieved on July 7, 2023, from <https://www.worldbank.org/en/publication/globalfindex/Report>
- Doran, N.M. Bădîrcea, R.M. Manta, A.G. (2020). Digitization and Financial Performance of Banking Sectors Facing COVID-19 Challenges in Central and Eastern European Countries. *Electronics*, 11, 3483. <https://doi.org/10.3390/electronics11213483>
- Duan, L. & Xiong, Y. (2015). Big data analytics and business analytics. *Journal of Management Analytics*, 2:1, 1-21, DOI: 10.1080/23270012.2015.1020891
- Gabor, D., Brooks, S.H. (2017). The Digital Revolution in Financial Inclusion: International development in the fintech era. *New Political Economy*, 22(4), 423-436, <https://doi.org/10.1080/13563467.2017.1259298>
- IRES. (2020). Romanians and banks during the COVID pandemic-19 - Opinion poll. Retrieved on 10 July, 2023, from <https://ires.ro/articol/399/romanii--i-bancile-pe-durata-pandemiei-de-covid---19>
- i-SCOOP.(2015). Digital Transformation. Retrieved on 16 July, 2023, from <https://www.i-scoop.eu/digital-transformation/>
- Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., Kailer, N., & Weinmann, A. (2022). Digital transformation in business and management research: An overview of the current status quo. *International Journal of Information Management*, 63, Article 102466. <https://doi.org/10.1016/j.ijinfomgt.2021.102466>
- Kreitshtstein, A. (2017). Digital transformation in financial services. Deloitte Insights, Retrieved on 17 July 20, 2023, from <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Financial-Services/gx-digital-transformation-in-f si.pdf>
- Mbama, C., Bynum, A., Iwu, C., & Nwigwe, C. (2018). Innovation in service delivery and customer satisfaction in the Nigerian banking industry. *International Journal of Research and Innovation in Social Science*, 2(6), 108-116.
- Murinde, V., Rizopoulos, E. & Zachariadis, M. (2022). The impact of the FinTech revolution on the future of banking: Opportunities and risks. *International Review of Financial Analysis*, Elsevier, vol. 81(C).
- Omarini, A. (2017). The Digital Transformation in Banking and The Role of FinTechs in the New Financial Intermediation Scenario. *International Journal of Finance, Economics and Trade* ,1(1).1-6.
- Pereira, C.S.; Durão, N.; Moreira, F.; Veloso, B. (2022). The Importance of Digital Transformation in International Business. *Sustainability*, 14, 834. <https://doi.org/10.3390/su14020834>
- Popa, I.C. & Luca, G. 2022. Digitization of Banking Services Before and After the Pandemic. Finance - Challenges of the Future 2022, *University of Craiova, Faculty of Economics and Business Administration*, 1(24), 163-173.
- Potapova, E.A., Iskoskov, M.O., Mukhanova, N.V. (2022). The Impact of Digitalization on Performance Indicators of Russian Commercial Banks in 2021. *J. Risk Financial Manag* 2022, 15, 452. <https://doi.org/10.3390/jrfm15100452>
- Pousttchi, K., & Dehnert, J. (2018). Determining success factors of digital transformation efforts in the banking sector: A literature review. *In Proceedings of the 51st Hawaii International Conference on System Sciences*.
- Rogers, David L. (2016). *The Digital Transformation Playbook : Rethink your Business for the Digital Age (E-Book)* . New York: Columbia University Press.

- Schipor L., Duhnea, C. (2022). Corporate Social Responsibility of the Romanian Banking Sector During the COVID-19 Crisis. *Romanian Economic Journal*, 25(84), 121-133.
- Schuchmann, D., & Seufert, A. (2015). The impact of digitalization on business models in the creative industries: A review. *International Journal of Entrepreneurial Venturing*, 7(2), 107-128.
- Stanciu, A. I. (2017). The impact of digital transformation on the banking industry. *Procedia Economics and Finance*, 39, 625-630.
- Versal, N., Erastov, V., Balytska, M., Honchar, I. (2022). Digitalization Index: Case for Banking System. *Statistika: Statistics and Economy Journal*. 102. 426-442. <https://doi.org/10.54694/stat.2022.16>
- Werth, O., Schwarzbach, C., Rodríguez Cardona, D., Breitner, M. H., & Graf von der Schulenburg, J. M. (2020). Influencing factors for the digital transformation in the financial services sector. *Zeitschrift für die gesamte Versicherungswissenschaft*, 109, 155-179.
- Westerman, G., Bonnet, D., & McAfee, A. (2014). *Leading Digital: Turning Technology into Business Transformation*, Harvard Business Review Press.
- Windasari, N. A., Kusumawati, N., Larasati, N., Revira Puspasuci, A. (2022). Digital-only banking experience: Insights from gen Y and gen Z. *Journal of Innovation & Knowledge (JIK)*, Elsevier, 7(2), 1-10, <https://doi.org/10.1016/j.jik.2022.100170>.
- Yıldırım, A.C.; Erdil, E. (2023). The effect of Covid-19 on digital banking explored under business model approach. *Qualitative Research in Financial Markets*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/QRFM-08-2021-0142>