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Impact of Digitalization on Serbian Banking: Social Factors and Customer Satisfaction

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Abstract

The banking sector, crucial to economic growth in developing nations, is undergoing rapid digital transformation, especially in Serbia, where competition among banks is fierce. This study examines how social factors—age, education, computer literacy, and income—influence the use and satisfaction with digital banking services in Serbia. A survey of 145 customers was conducted, utilizing the E-S-QUAL framework to assess electronic service quality in terms of efficiency, fulfillment, system availability, and privacy. Findings show that older age, lower education, and limited computer literacy, especially with lower income, negatively impact digital banking usage and satisfaction, while higher education and computer literacy enhance them. To ensure successful digital transformation, policymakers must foster supportive regulations, businesses should improve service quality, and customers need to recognize the benefits of broader adoption. Digitalization offers opportunities but requires coordinated efforts to address its challenges and achieve customer satisfaction.

Keywords

Digital Banking, E-S-QUAL Framework, Social Demographics, Customer Satisfaction, Digital Transformation

1. Introduction

The rapid pace of technological advancement in the 21st century has fundamentally transformed industries worldwide, with innovations in artificial intelligence, robotics, and e-commerce reshaping consumer behavior and business models (Spinale, 2020). This digital revolution has had a particularly big impact on the banking sector, which is a crucial driver of economic growth in developing nations. The

Covid-19 pandemic has further accelerated these shifts, disrupting traditional practices while simultaneously creating new opportunities (Consultancy UK, 2021; McKinsey & Company, 2021; Smith & Tanner, 2021; Els & Bisschoff, 2023).

In Serbia, the banking industry has experienced steady digital progression over the past decade, with a notable acceleration in recent years. This study focuses on the digital transformation of the Serbian banking sector, addressing the challenges, risks, and impacts on service quality and customer satisfaction across various social groups. The research is particularly timely given the competitive nature of the Serbian banking market, where the top 10 banks control 80% of assets, necessitating a shift from standardized services to more tailored offerings to meet evolving customer demands (Novikova et al., 2022).

One of the central challenges in the digitalization of the Serbian banking sector is to understand how social factors—such as age, education, computer literacy, and income—affect the adoption and satisfaction of digital banking services. Despite the widespread adoption of digital technologies, significant disparities persist in how different demographic groups engage with and benefit from these services. Older individuals and those with limited computer literacy may struggle to adopt digital banking, resulting in lower satisfaction and potentially excluding them from the full benefits of financial inclusion. Similarly, variations in income and education levels contribute to differing levels of digital banking usage and customer experience. Addressing these social factors is crucial for the successful implementation of digital banking, ensuring that the advantages of technological transformation are accessible to all customer groups, and enhancing overall customer satisfaction.

This paper aims to provide a comprehensive analysis of digitalization in the Serbian banking sector through three key objectives. First, we examine the transformative nature of digitalization as a trend and how the Serbian banking sector has adapted to these changes, with a focus on top market players. Secondly, we analyze the challenges facing the digitalization process in the Serbian banking sector through the lens of a PEST (Political, Economic, Social, and Technological) analysis. Finally, we evaluate how social factors—specifically age, education, computer literacy, and monthly income—affect the usage and perceived quality of digital banking services.

To achieve these objectives, the study employs a mixed-methods approach. It combines a thorough analysis of industry trends and strategies adopted by leading banks with a survey of 145 customers, utilizing the E-S-QUAL framework to assess electronic service quality in terms of efficiency, fulfillment, system availability, and privacy.

The findings of this research offer valuable insights for both the business and academic sectors. For banking managers, it highlights the challenges and opportunities associated with digital transformation, emphasizing the importance of categorizing clients by age, education, and computer literacy. This understanding enables banks to develop customized solutions that enhance customer satisfaction

and competitiveness in a price-sensitive market (Wittkop et al., 2018; Win, 2023; Xin et al., 2024). From an academic perspective, this study opens avenues for further research on the influence of sociological factors on digital banking adoption and service quality. It underscores the need for banks to continuously monitor e-service quality as digital services grow in prominence, aligning with broader global trends.

As the banking sector continues to evolve in response to technological advancements and changing customer expectations, this research provides a timely and relevant examination of the factors influencing the success of digital transformation in Serbia's banking industry. The insights gained from this study can inform strategies for policymakers, businesses, and consumers to navigate the challenges and opportunities presented by the on-going digital revolution in banking.

2. Literature Review

The digitalization of banking services is a transformative process requiring substantial investments in innovative technologies. Most advancements, such as online payments and mobile banking, are evolutionary, enhancing existing practices (Werth et al., 2020). However, disruptive technologies like blockchain, cryptocurrencies, Internet of Things, and cloud computing can revolutionize banking by creating new markets and challenging traditional methods (Rahman et al., 2017; Demiralay & Golitsis, 2021). In Serbia, digital banking innovations began between 2005 and 2008, with mobile banking apps gaining popularity due to smartphone growth. This transformation impacts the banking sector's entire marketing mix, driving significant changes across all 4Ps of marketing.

The Serbian banking sector, comprising of 22 banks as of 2021, is undergoing significant consolidation, with expectations of the number reducing to 20 due to on-going mergers and acquisitions. The sector's total assets grew by 9.7% from EUR 39.1 billion in 2020 to EUR 42.93 billion in 2021. Despite the high number of banks, the top 10 institutions hold approximately 86% of the sector's assets. Post-mergers, this concentration is expected to rise to 90%, with only two of these top banks having domestic capital; the rest are European affiliates.

Key sector indicators include a robust Capital Adequacy Ratio (CAR) of 20%, a low Non-Performing Loan (NPL) ratio of 3.4%, and strong profitability with a Return on Assets (RoA) of 1.4% and Return on Equity (RoE) of 10%; liquid assets constitute 26% of Total Assets; the asset composition remains stable, with loans making up 67%, securities 17%, and cash 16%.

The rise of digital banking, accelerated by the Covid-19 pandemic, has notably shifted customer behavior (Els & Bisschoff, 2023). E-banking and m-banking users have surged, with a 24% average growth over the past three years, and m-banking transactions have tripled since 2019. Cash payments have decreased significantly, while card and e-money transactions have increased by nearly 20% annually. Online purchases also grew significantly, with transaction values up 28% in local currency and 53% in Euro over five years.

In response, banks have enhanced their digital services, though offerings vary. Some banks have introduced online loans and smart ATMs, and the sector now operates 24/7, reflecting a shift from traditional banking hours. However, no banks have tailored digital solutions for specific client groups beyond general adaptations. Future analysis will explore disparities in digital adoption based on client demographics and behavior (NBS, 2024). Digitalization involves adapting business practices to new trends, facing challenges that can be external or internal. This paper focuses on external factors, analyzed through the PEST framework, to identify and address challenges strategically (Werth et al., 2020).

Political factors affecting the financial sector include government stability, regulatory frameworks, and corruption levels, with a noted disparity between regulatory priorities and innovation (Stubbe, 2016; Bantimaroudi et al., 2023). Post-2008 financial crisis, regulatory requirements have escalated, impacting banks and their strategic operations. This heightened regulatory environment poses challenges for banks seeking to maintain stability while simultaneously competing with innovative, non-regulated financial solutions offered by fintech companies such as PayPal, Amazon, various cryptocurrencies, Alipay, iWoca, Kickstarter, Square, and others (McKinsey, 2016; Rodrigues et al., 2024). At the same time, regulatory policies are crucial for digital transformation in banking. Governments and regulatory bodies play a key role in driving and supporting digital innovation for societal benefits (OECD, 2022).

Serbia's Ministry of Telecommunications and Information Society is aligning its digital agenda with EU standards. Key objectives include enhancing electronic communications, e-governance, e-health, e-justice, ICT integration, electronic commerce, and promoting ICT business and information security (CDI, 2022).

However, a notable challenge arises in the realm of IT security, where the government plays a pivotal role in addressing issues related to security requirements and the protection of personal and business data. Regrettably, as of now, neither the EU nor Serbia have established laws that delineate these specific requirements, while regulatory instruments to enforce implementation are lacking (Hessel & Rebmann, 2020). Future developments are expected to drive higher demand for improved IT security, requiring additional investments to address risks such as cyber-attacks and data loss, thus protecting against vulnerabilities (CDI, 2022).

In summary, the literature underscores the dual nature of digitalization in the banking sector, characterized by both evolutionary and disruptive innovations that necessitate substantial investments. As the Serbian banking industry navigates this transformation, it faces challenges related to regulatory compliance, market concentration, and evolving customer expectations. The data indicates a shift in consumer behavior toward digital channels, accelerated by the Covid-19 pandemic, while traditional banking practices are increasingly being challenged by fintech solutions. Moreover, external factors such as political stability, regulatory frameworks, and IT security concerns play critical roles in shaping the digital landscape. The aforementioned highlight the importance of understanding these

dynamics to inform strategic decisions that align with technological advancements and consumer needs, paving the way for enhanced digital service offerings in the Serbian banking sector.

3. Methodology

This study evaluates the impact of sociodemographic factors on digital banking services in Serbia by examining population data on age, education, and IT literacy, alongside transaction data from the National Bank of Serbia (NBS, 2024). Although qualitative research provides in-depth insights into customer experiences, it was deemed unsuitable for testing usage levels and service quality due to its limitations (Strauss & Corbin, 1990; Omniconvert, 2022). Instead, the study adopts a quantitative approach, using surveys to measure electronic service quality (E-S-QUAL), focusing on efficiency, fulfillment, system availability, and privacy (Parasuraman et al., 2005; Yaya et al., 2012).

The E-S-QUAL framework, developed by Parasuraman, Zeithaml, & Malhotra (2005), is an extension of the widely used SERVQUAL model. While SERVQUAL was designed to measure service quality in traditional offline settings across five dimensions (reliability, assurance, tangibles, empathy, and responsiveness), E-S-QUAL was specifically created to address the unique aspects of electronic service quality. E-S-QUAL comprises of four core dimensions: efficiency (ease and speed of accessing and using the site), fulfillment (extent to which the website's promise about order delivery and item availability are fulfilled), system availability (correct technical functioning of the site), and privacy (degree to which the site is safe and protects customer information) (Zeithaml et al., 2002; Parasuraman et al., 2005).

This adaptation makes E-S-QUAL particularly suitable for assessing digital banking services, as it captures the critical elements of online service delivery. However, recent research suggests that E-S-QUAL may need to be updated to fully capture the evolving nature of digital services (Yoo & Donthu, 2001; Goel, 2017; Yaya et al., 2017). Despite this limitation, E-S-QUAL remains a valuable tool for assessing e-service quality, especially in the context of digital banking.

Surveys, being cost-effective and easy to analyze, were chosen for their ability to statistically assess customer perceptions across different sociodemographic groups, and to identify gaps and opportunities for improving digital services (Podsakoff et al., 2003; Queirós et al., 2017). This approach aligns with established practices in business research methods (Bryman & Bell, 2015).

To ensure the reliability of the data, a structured questionnaire was designed based on prior research in digital banking and customer satisfaction (Parasuraman et al., 2005). The survey was distributed to a diverse sample, covering a range of age, education, income, and computer literacy levels. The sample selection was guided by demographic data from official Serbian statistical reports (Statistical Office of the Republic of Serbia, 2021) to ensure accurate representation of the population. Furthermore, the results were cross-referenced with recent studies on

digital banking trends in the region (Kraus et al., 2021), ensuring that the findings reflect both local and global patterns in digital service adoption and customer satisfaction.

The study targets users of digital banking services in Serbia, employing a non-probability sampling technique with snowball sampling to recruit participants. The initial sample was obtained through convenience sampling of acquaintances, which then expanded through their networks, utilizing social and chat applications for distribution. To determine an adequate sample size, RaoSoft software was employed, considering a 5% margin of error and a 95% confidence level, which suggested a target sample size of approximately 120. However, to increase representativeness and ensure a more comprehensive understanding of user experiences, the study surveyed 145 customers.

Furthermore, the E-S-QUAL framework guided the questionnaire design, focusing on evaluating the impact of social variables on perceived service quality (Parasuraman et al., 2005). The questionnaire comprised a mix of closed-ended and open-ended questions to capture quantitative and qualitative insights into user satisfaction and service quality perceptions. While formal robustness and reliability testing were not conducted, several measures were taken to enhance the study's validity. A small-scale pilot test was conducted to refine the questionnaire before full-scale implementation following van Teijlingen & Hundley (2002). Additionally, survey results were compared with secondary data from the National Bank of Serbia where possible, employing a form of triangulation to corroborate findings and enhance reliability (Denzin, 2017).

The study relied on the E-S-QUAL framework, which has been previously validated in multiple contexts, providing a degree of inherent reliability (Parasuraman et al., 2005; Yaya et al., 2012). The research design follows established practices in quantitative and mixed-methods approaches (Creswell & Creswell, 2018). Data analysis involved descriptive statistics to summarize participant demographics and service usage patterns, as well as inferential statistics to explore relationships between social factors and customer satisfaction levels. Limitations and potential biases are clearly acknowledged, allowing readers to interpret results with appropriate caution (Aguinis & Solarino, 2019). While more advanced multivariate data analysis techniques could potentially yield additional insights (Hair et al., 2019), they were beyond the scope of this exploratory study.

This research provides valuable initial insights into the Serbian digital banking landscape. Future studies should build upon this foundation by incorporating formal robustness checks and reliability testing to enhance the generalizability of findings in the Serbian context, further strengthening the understanding of sociodemographic factors' impact on digital banking services.

4. Results

Survey results are presented with some negative question responses reversed for consistency.

4.1. Demographics

The first set of responses relates to demographic data—gender, age, education, computer literacy, and income. While gender is irrelevant to the research objectives, other demographics are key to analyzing digital solution usage.

4.2. Gender

As observed in Table 1, 56.6 percent of participants were female, while the remaining 43.3 percent were male—in absolute numbers out of 145 participants 82 were female and 63 were male.

Table 1. Gender distribution.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	82	56.6	56.6	56.6
	Male	63	43.4	43.4	100.0
	Total	145	100.0	100.0	

Source: Authors' computation, 2024.

4.3. Age

Based on the information included in Table 2, participants were divided into four age groups which showed that almost 52.4 % of all participants were between 25 and 44 years old. The least number of participants are older than 65, only 15 participants. Also, there was a low number of the youngest gender group between 18 and 24 years old.

Table 2. Age distribution.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 24	21	14.5	14.5	14.5
	25 - 44	76	52.4	52.4	66.9
	45 - 64	33	22.8	22.8	89.7
	64+	15	10.3	10.3	100.0
	Total	145	100.0	100.0	

Source: Authors' computation, 2024.

The conclusion drawn from Tables 3 and Tables 4, is that education and computer literacy complement each other, since these categories seem to be interconnected and mutually supportive.

According to Table 5, the youngest and the oldest participants are within the lowest categories of income per month. Those that belong to the group of youngest participants just started working and probably have just a few years of experience,

while on the other side, the 65+ category is close to or in retirement and therefore their income is lower, compared to the other two categories.

Table 3. Age distribution and level of education.

		Primary education	Secondary education	Higher education	Graduate Degree	Total
Age in years	18 - 24	1	9	8	3	21
	25 - 44	0	4	8	64	76
	45 - 64	0	4	4	25	33
	64+	5	5	4	1	15
	Total	6	22	24	93	145

Source: Authors' computation, 2024.

Table 4. Age distribution and computer literacy level.

		Computer literacy level			
		Computer illiterate	Partial Computer skills	Computer literate	Total
Age in years	18 - 24	1	15	5	21
	25 - 44	0	1	75	76
	45 - 64	0	8	25	33
	64+	9	5	1	15
	Total	10	29	106	145

Source: Authors' computation, 2024.

Table 5. Age and monthly income.

		Monthly income				
		up to EUR 500	EUR 500 - 1000	EUR 1000 - 2000	above EUR 2000	Total
Age in years	18 - 24	11	9	1	0	21
	25 - 44	2	10	39	25	76
	45 - 64	2	11	12	8	33
	64+	7	7	1	0	15
	Total	22	37	53	33	145

Source: Authors' computation, 2024.

4.4. Education

Tables 6 and Tables 7 present the sample's educational level distribution and

computer literacy distribution, respectively. Most of the participants have a graduate degree a total of 93 or 64.1% of the sample, followed by participants with an undergraduate degree (24 participants) and those with a secondary education degree (22 participants).

Table 6. Education distribution.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Primary education	6	4.1	4.1	4.1
	Secondary education	22	15.2	15.2	19.3
	Higher education	24	16.6	16.6	35.9
	Graduate Degree	93	64.1	64.1	100.0
	Total	145	100.0	100.0	

Source: Authors' computation, 2024.

Table 7. Education and computer literacy distribution.

		Computer literacy level			
		Computer illiterate	Partial Computer skills	Computer literate	Total
Level of education	Primary education	6	0	0	6
	Secondary education	4	13	5	22
	Higher education	0	14	10	24
	Graduate Degree	0	2	91	93
	Total	10	29	106	145

Source: Authors' computation, 2024.

Education and computer literacy go hand in hand, so there is no graduate degree without computer skills, while on the other hand, persons with only primary education, have no computer skills at all. Results indicate that persons with graduate degrees are more familiar with computers/technology/digitalization and probably will be more oriented toward new trends and have higher acceptance levels, compared to the group without education and computer skills.

Table 8 shows that monthly income is directly related with education, especially in the higher categories, meaning that higher salaries, above EUR 1000, are reserved for participants with graduate degrees, while there is no person with secondary or lower education that has a salary above EUR 1000.

4.5. Computer Literacy Level

Most of the participants are computer literate, a total of 106 or 80% of the sample,

followed by participants with partial computer skills, a total of 29 participants, while 10 participants are computer illiterate as can be seen in Table 9.

Table 8. Education and monthly income distribution.

		Monthly income				
		up to EUR 500	EUR 500 - 1000	EUR 1000 - 2000	above EUR 2000	Total
Level of Education	Primary education	5	1	0	0	6
	Secondary education	8	14	0	0	22
	Higher education	6	10	5	3	24
	Graduate Degree	3	12	48	30	93
	Total	22	37	53	33	145

Source: Authors' computation, 2024.

Table 9. Computer literacy distribution.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Computer illiterate	10	6.9	6.9	6.9
	Computer literate	106	73.1	73.1	80.0
	Partial Computer skills	29	20.0	20.0	100.0
	Total	145	100.0	100.0	

Source: Authors' computation, 2024.

Similar results with the education hold for computer literacy, as displayed in Table 10; *i.e.*, someone who is computer illiterate cannot obtain a salary above EUR 1000, and with partial computer skills only 3 out of 29 can have a monthly income above EUR 1000.

4.6. Monthly Income

Within the sample of 145 participants, the majority earns between EUR 1000 - EUR 2000, which is a total of 53 participants or 36.6%, followed by the lower category, that of EUR 500 - EUR 1000, or 37 participants. The third category, the one above EUR 2000, accounts for 33 participants or 22.8%, as displayed in Table 11.

4.7. Level and Frequency of Usage of Digital Services

The second group of results refers to the level and frequency of usage of digital

solutions. In Table 12 most of the sample, or 58.6%, use digital services above 5 years.

Table 10. Computer literacy and monthly income distribution.

		Monthly income				
		up to EUR 500	EUR 500 - 1000	EUR 1000 - 2000	above EUR 2000	Total
Computer literacy level	Computer illiterate	7	3	0	0	10
	Partial Computer skills	9	17	3	0	29
	Computer literate	6	17	50	33	106
	Total	22	37	53	33	145

Source: Authors' computation, 2024.

Table 11. Monthly income distribution.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	above EUR 2000	33	22.8	22.8	22.8
	EUR 1000 - 2000	53	36.6	36.6	59.3
	EUR 500 - 1000	37	25.5	25.5	84.8
	up to EUR 500	22	15.2	15.2	100.0
	Total	145	100.0	100.0	

Source: Authors' computation, 2024.

Table 12. Level of usage of digital services.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 1 year	13	9.0	9.0	9.0
	1 year to 3 years	20	13.8	13.8	22.8
	3 years to 5 years	25	17.2	17.2	40.0
	Above 5 years	85	58.6	58.6	98.6
	Never	2	1.4	1.4	100.0
	Total	145	100.0	100.0	

Source: Authors' computation, 2024.

Looking closer at the age categories in Table 13, it is evident that the majority of the sample, or 61 participants, have been using digital services for more than 5

years, and they belong to the 25 - 44 group, followed by 22 participants from the 45 - 64 group. All of those who belong to the youngest age group use digital services, while only one who never used any digital services is from the "silent generation" of 64+.

Table 13. Level of usage of digital services within the different age groups.

		Level of usage of digital services					
		<1 year	1 year to 3 years	3 years to 5 years	Above 5 years	Never	Total
Age in years	18 - 24	10	7	4	0	0	21
	25 - 44	1	5	9	61	0	76
	45 - 64	1	3	7	22	0	33
	64+	1	5	5	2	2	15
	Total	13	20	25	85	2	145

Source: Authors' computation, 2024.

There is no person with higher or graduate degree in the sample that does not use digital services, while those that do not use any of the digital services are those having a lower level of education (Table 14).

Table 14. Level of usage of digital services and level of education.

		Level of usage of digital services					
		<1 year	1 year to 3 years	3 years to 5 years	Above 5 years	Never	Total
Level of education	Primary education	1	4	0	0	1	6
	Secondary education	7	6	4	4	1	22
	Higher education	2	3	9	10	0	24
	Graduate Degree	3	7	12	71	0	93
	Total	13	20	25	85	2	145

Source: Authors' computation, 2024.

Those that do not use digital services belong to the computer illiterate group, which is similar to what we observed for the education level. On the other hand, all of those with a good level of computer skills have been using digital services, and most of them for more than 5 years. All of the above are evident in Table 15 above.

Table 15. Level of usage of digital services within the different age groups.

		Level of usage of digital services					
		<1 year	1 year to 3 years	3 years to 5 years	Above 5 years	Never	Total
Computer literacy level	Computer illiterate	2	4	2	0	2	10
	Partial Computer skills	6	9	9	5	0	29
	Computer literate	5	7	14	80	0	106
	Total	13	20	25	85	2	145

Source: Authors' computation, 2024.

Similar to education, computer literacy and monthly income are also interconnected, where the higher the education level is, the higher their computer literacy, and the higher the level of usage of digital services as well, as described in Table 16.

Table 16. Level of usage of digital services within the different age groups.

		Level of usage of digital services					
		<1 year	1 year to 3 years	3 years to 5 years	Above 5 years	Never	Total
Monthly income	up to EUR 500	11	6	0	3	2	22
	EUR 500 - 1000	1	10	13	13	0	37
	EUR 1000 - 2000	1	3	9	40	0	53
	above EUR 2000	0	1	3	29	0	33
	Total	13	20	25	85	2	145

Source: Authors' computation, 2024.

The observed frequency of usage of digital services is rather higher, with 73.8% using digital services for all of their transactions (Table 17).

Table 17. Level of usage of digital services within the different age groups.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 - 3 times per month	15	10.3	10.3	10.3
	3 - 5 times per month	21	14.5	14.5	24.8
	For all transactions	107	73.8	73.8	98.6
	Never	2	1.4	1.4	100.0
	Total	145	100.0	100.0	

Source: Authors' computation, 2024.

Showing alignment with the level of usage, the highest frequency is within the age group of 25 - 44 (68) and 45 - 64 (29) of those using digital services for all their transactions; within the group of those above 64+ only 2 are using digital services for all their transactions, while we find the same number of people not using digital services at all (Table 18).

Table 18. Frequency of usage of digital services within the different age groups.

		Frequency of Use of Digital Banking Services				
		1 - 3 times per month	3 - 5 times per month	For all transactions	Never	Total
Age in years	18 - 24	3	10	8	0	21
	25 - 44	3	5	68	0	76
	45 - 64	3	1	29	0	33
	64+	6	5	2	2	15
	Total	5	21	107	2	145

Source: Authors' computation, 2024.

As can be seen in Table 19, the majority of graduate degree holders is using digital services for all their transactions, while people with an educational level of primary education are using digital services only 1 to 3 times per month or not at all.

Table 19. Level of usage of digital services within the different age groups.

		Frequency of Use of Digital Banking Services				
		1 - 3 times per month	3 - 5 times per month	For all transactions	Never	Total
Level of education	Primary education	5	0	0	1	6
	Secondary education	4	7	10	1	22
	Higher education	2	8	14	0	24
	Graduate Degree	4	6	83	0	93
	Total	15	21	107	2	145

Source: Authors' computation, 2024.

The majority of computer literate persons are using digital services for all transactions, while computer illiterate ones rarely use a computer, approximately 1 to 3 times per month or not at all (Table 20).

Table 20. Level of usage of digital services within the different age groups.

		Frequency of Use of Digital Banking Services				
		1 - 3 times per month	3 - 5 times per month	For all transactions	Never	Total
Computer literacy level	Computer illiterate	6	2	0	2	10
	Partial Computer skills	4	12	13	0	29
	Computer literate	5	7	94	0	106
	Total	15	21	107	2	145

Source: Authors' computation, 2024.

With regards to the two highest paid groups in terms of monthly income (EUR 1000 - 2000 and above EUR 2000), 79 out of 86 are using digital services for all transactions. The second main finding emanating form Table 21 is that the lower the income, the lower the frequency of the usage of digital banking services.

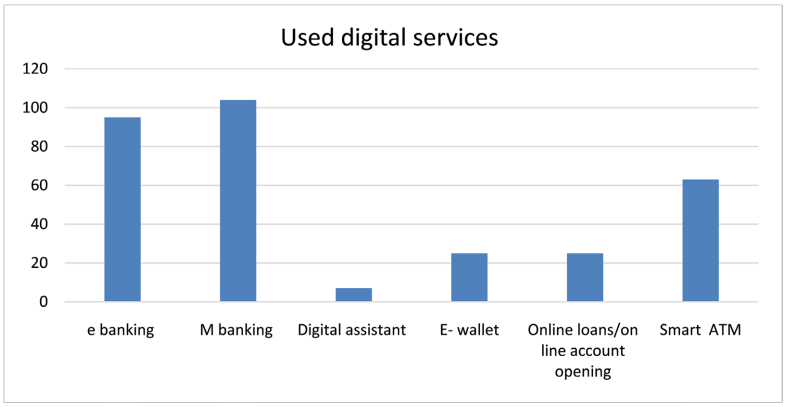
Table 21. Level of usage of digital services within the different age groups.

		Frequency of Use of Digital Banking Services				
		1 - 3 times per month	3 - 5 times per month	For all transactions	Never	Total
Monthly income	up to EUR 500	10	7	3	2	22
	EUR 500 - 1000	4	8	25	0	37
	EUR 1000 - 2000	0	5	48	0	53
	above EUR 2000	1	1	31	0	33
	Total	15	21	107	2	145

Source: Authors' computation, 2024.

4.8. Usage of digital services

Figure 1 presents the use of the most common digital services. What is clear is that out of the 6 digital services that are offered, the majority uses M-banking and E-Banking, which are evidently the two dominant services, followed by the smart ATM. All other services are used by a small number of people, around 20 for the E-wallet and Online loans/account opening, and less than 10 for the Digital Assistant. These constitute less than 15% of the sample.



Source: Authors' computation, 2024.

Figure 1. Used digital services.

The third group of results covers customer satisfaction, divided into four subcategories: Efficiency, System Availability and Reliability, Fulfillment, and Security and Privacy. To assess perceived service quality differences, these results are analysed across social factors such as age, education, computer literacy, and income. The Means tables, displaying the central tendency for each group, highlight differences in dependent variables. These comparisons, analysed using multivariate techniques, are vital for identifying patterns and informing decision-making, with social factors as the dependent variable across all subgroups.

4.9. Age

The analysis of age as a social factor reveals high satisfaction scores in Efficiency, System, and Fulfillment categories, while Privacy scores lower. Data security and privacy remain concerns across all age groups.

Table 22 shows that the 25 - 64 age group scored higher, while older customers displayed the largest deviation in perceiving digital service efficiency.

Table 22. Efficiency by age in years.

Age in years		EFF1	EFF2	EFF3	EFF4	EFF5	EFF6	EFF7	EFF8
	Mean	4.57	4.57	4.57	4.62	1.52	4.67	4.62	1.43
18 - 24	N	21	21	21	21	21	21	21	21
	Std. Deviation	.598	.598	.598	.590	.814	.577	.590	.598
	Mean	4.71	4.84	4.71	4.42	1.36	4.76	4.53	1.79
25 - 44	N	76	76	76	76	76	76	76	76
	Std. Deviation	.780	.567	.649	.837	.795	.709	.808	1.050
	Mean	4.73	4.79	4.73	4.33	1.64	4.70	4.24	1.91
45 - 64	N	33	33	33	33	33	33	33	33
	Std. Deviation	.574	.545	.517	.957	.962	.585	1.032	1.071

Continued

	Mean	3.93	3.93	4.00	3.73	2.40	3.80	4.13	2.53
64+	**N**	15	15	15	15	15	15	15	15
	Std. Deviation	.704	.704	.655	.884	1.056	.676	.640	1.060
	Mean	4.61	4.70	4.62	4.36	1.55	4.63	4.43	1.84
Total	**N**	145	145	145	145	145	145	145	145
	Std. Deviation	.738	.638	.646	.863	.912	.715	.832	1.032

Source: Authors' computation, 2024.

System availability and reliability scores range from 4.37 to 4.67, with the youngest group (under 24) scoring the highest (4.76 - 4.81). The oldest group exhibits the lowest result (4.0), reflecting lower trust in new technology. Within the questions referred to system availability and reliability the mean score of the sample is between 4.37 - 4.67, while the highest scores within the youngest age group up to 24 years are 4.76 - 4.81. Younger generations are raised with different types of digital content delivered through mobile phones and tablets, which can be an indication of their faster acceptance of new products and services. On the other side, the oldest group again exhibits the lowest score (4.0), which signifies less trust in availability and reliability, thus, even less trust in new technology (Table 23).

Table 23. System availability by age in years.

Age in years		SYS1	SYS2	SYS3	SYS4
	Mean	4.76	4.81	4.81	4.76
18 - 24	**N**	21	21	21	21
	Std. Deviation	.539	.402	.512	.539
	Mean	4.42	4.37	4.78	4.75
25 - 44	**N**	76	76	76	76
	Std. Deviation	.753	.763	.645	.676
	Mean	4.24	4.27	4.67	4.73
45 - 64	**N**	33	33	33	33
	Std. Deviation	1.001	.719	.692	.761
	Mean	3.87	4.00	4.00	4.00
64+	**N**	15	15	15	15
	Std. Deviation	.834	.845	.845	.756
	Mean	4.37	4.37	4.68	4.67
Total	**N**	145	145	145	145
	Std. Deviation	.824	.745	.696	.717

Source: Authors' computation, 2024.

Table 24 shows that fulfillment scores are high (above 4.6), with younger age groups scoring higher. The 45 - 64 group scores slightly lower, and the oldest group shows the lowest fulfillment. Then, Table 25 reports privacy scores signifying that the 45 - 64 age group reports the highest mean scores.

Table 24. Fulfillment by age in years.

Age in years		FUL1	FUL2	FUL3	FUL4	FUL5	FUL6	FUL7
18 - 24	Mean	4.71	4.86	4.48	4.81	4.86	1.33	4.71
	N	21	21	21	21	21	21	21
	Std. Deviation	.717	.359	.512	.402	.359	.577	.561
25 - 44	Mean	4.58	4.76	4.74	4.76	4.70	1.54	4.79
	N	76	76	76	76	76	76	76
	Std. Deviation	.804	.630	.700	.630	.674	.958	.596
45 - 64	Mean	4.39	4.58	4.67	4.55	4.61	1.58	4.76
	N	33	33	33	33	33	33	33
	Std. Deviation	.864	.830	.645	.794	.659	.792	.502
64+	Mean	3.67	4.00	3.93	4.07	4.00	2.60	3.60
	N	15	15	15	15	15	15	15
	Std. Deviation	.816	.655	.594	.704	.756	1.056	.986
Total	Mean	4.46	4.66	4.60	4.65	4.63	1.63	4.65
	N	145	145	145	145	145	145	145
	Std. Deviation	.850	.691	.691	.682	.676	.942	.712

Source: Authors' computation, 2024.

Table 25. Privacy by age in years.

Age in years		PRI1	PRI2	PRI3
18 - 24	Mean	4.05	3.71	1.81
	N	21	21	21
	Std. Deviation	.921	.956	.680
25 - 44	Mean	4.16	4.01	1.78
	N	76	76	76
	Std. Deviation	.953	1.113	.947
45 - 64	Mean	4.21	4.00	1.79
	N	33	33	33
	Std. Deviation	.857	1.225	.960

Continued

64+	Mean	3.20	3.27	2.73
	N	15	15	15
	Std. Deviation	.941	.704	.594
Total	Mean	4.06	3.89	1.88
	N	145	145	145
	Std. Deviation	.963	1.100	.924

Source: Authors' computation, 2024.

4.10. Education

The second social category that can play a significant role in the level of acceptance and usage of digital services is education. The initial premise of this paper is that the lowest the education level is, the lowest the acceptance and usage level of digital services are. Analysis of the results shows that the greatest visible difference between classified social groups based on education are recorded in this subcategory.

Our results in Table 26, show explicitly the lowest level of results within the group of primary education participants, where mean results for the positive formulated questions is within the range of 3.33 - 3.83, while the sample mean is 4.34 - 4.70.

Table 26. Efficiency by level of education.

Age in years		EFF1	EFF2	EFF3	EFF4	EFF5	EFF6	EFF7	EFF8
Primary education	Mean	3.33	3.33	3.50	3.33	3.33	3.33	3.83	2.83
	N	6	6	6	6	6	6	6	6
	Std. Deviation	.516	.516	.548	.516	.816	.516	.408	.983
Secondary education	Mean	4.27	4.32	4.27	4.18	1.59	4.27	4.18	1.86
	N	22	22	22	22	22	22	22	22
	Std. Deviation	.935	.945	.935	1.140	.908	1.032	1.181	1.167
Higher education	Mean	4.58	4.62	4.50	4.33	1.42	4.62	4.50	1.46
	N	24	24	24	24	24	24	24	24
	Std. Deviation	.717	.576	.590	1.049	.504	.576	.834	.588
Graduate Degree	Mean	4.78	4.89	4.81	4.47	1.46	4.81	4.52	1.87
	N	93	93	93	93	93	93	93	93
	Std. Deviation	.587	.375	.449	.701	.891	.537	.731	1.055
Total	Mean	4.61	4.70	4.62	4.36	1.55	4.63	4.43	1.84
	N	145	145	145	145	145	145	145	145
	Std. Deviation	.738	.638	.646	.863	.912	.715	.832	1.032

Source: Authors' computation, 2024.

Results of means record the gradual growth of the graduate education population, which is the only group above the sample mean for all the questions.

The mean scores of system availability and reliability of the sample listed in Table 27, are between 4.37 - 4.68, while the highest scores within the two most educated groups are between 4.38 - 4.84. There is also a pattern with the primary education group, which is visible in this subcategory as well, where the results for the means vary and are between 3.17 - 3.50; a finding that is significantly lower compared to the result for the sample mean.

Table 27. System availability by level of education.

Level of education		SYS1	SYS2	SYS3	SYS4
Primary education	Mean	3.17	3.50	3.33	3.50
	N	6	6	6	6
	Std. Deviation	.753	.548	.516	.548
Secondary education	Mean	4.23	4.36	4.36	4.32
	N	22	22	22	22
	Std. Deviation	1.193	.902	1.136	1.249
Higher education	Mean	4.50	4.58	4.67	4.67
	N	24	24	24	24
	Std. Deviation	.780	.654	.637	.482
Graduate Degree	Mean	4.45	4.38	4.84	4.83
	N	93	93	93	93
	Std. Deviation	.668	.706	.425	.481
Total	Mean	4.37	4.37	4.68	4.67
	N	145	145	145	145
	Std. Deviation	.824	.745	.696	.717

Source: Authors' computation, 2024.

A very high score on fulfillment is observed. It is above the sample mean of 4.6, for the Graduate degree subgroup, while the primary education group posted scores between 3.17 - 3.83, indicating neutral responses on average (Table 28).

Table 28. Fulfillment by level of education.

Level of education		FUL1	FUL2	FUL3	FUL4	FUL5	FUL6	FUL7
Primary education	Mean	3.17	3.83	3.83	3.83	3.83	3.17	3.17
	N	6	6	6	6	6	6	6
	Std. Deviation	.408	.408	.408	.753	.753	.753	.408

Continued

Secondary education	Mean	4.27	4.18	4.14	4.41	4.41	1.50	4.41
	N	22	22	22	22	22	22	22
	Std. Deviation	1.032	1.220	1.082	.854	.908	.802	.796
Higher education	Mean	4.42	4.79	4.46	4.71	4.58	1.38	4.42
	N	24	24	24	24	24	24	24
	Std. Deviation	.929	.509	.588	.690	.654	.647	.974
Graduate Degree	Mean	4.60	4.78	4.80	4.74	4.74	1.62	4.86
	N	93	93	93	93	93	93	93
	Std. Deviation	.724	.463	.501	.588	.569	.966	.432
Total	Mean	4.46	4.66	4.60	4.65	4.63	1.63	4.65
	N	145	145	145	145	145	145	145
	Std. Deviation	.850	.691	.691	.682	.676	.942	.712

Source: Authors' computation, 2024.

At the sample level, privacy has recorded the lowest scores, indicating it as the main concern of users of digital services, as can be seen in Table 29. Within the primary education group, a score of ≤ 3, exhibits significant doubt in terms of the protection of personal information, transactions details, and financial information.

Table 29. Privacy by level of education.

Level of education		PRI1	PRI2	PRI3
Primary education	Mean	2.83	3.00	2.83
	N	6	6	6
	Std. Deviation	.408	.000	.408
Secondary education	Mean	3.95	3.41	1.86
	N	22	22	22
	Std. Deviation	.899	.908	.774
Higher education	Mean	4.13	3.71	1.75
	N	24	24	24
	Std. Deviation	.992	1.334	.847
Graduate Degree	Mean	4.14	4.11	1.86
	N	93	93	93
	Std. Deviation	.951	1.047	.973

Continued

	Mean	4.06	3.89	1.88
Total	**N**	145	145	145
	Std. Deviation	.963	1.100	.924

Source: Authors' computation, 2024.

4.11. Computer Literacy

Along with education, computer literacy plays a significant role in the degree of acceptance and usage of digital services. The positive effect of the increase in computer literacy, reported in the last 10 years according to the data from the census, is visible in this study, where only 10 participants self-declared as being computer illiterate.

Results for the evaluated efficiency of digital services, reported in Table 30, are the lowest for the illiterate population (3.50 - 3.80) and the highest for the computer literate (4.45 - 4.87), while the sample mean is at a range of 4.36 - 4.70.

Table 30. Efficiency by computer literacy level.

Computer literacy level		EFF1	EFF2	EFF3	EFF4	EFF5	EFF6	EFF7	EFF8
	Mean	3.50	3.50	3.60	3.30	3.10	3.40	3.80	2.80
Computer illiterate	**N**	10	10	10	10	10	10	10	10
	Std. Deviation	.527	.527	.516	.675	.876	.516	.422	.919
	Mean	4.52	4.48	4.48	4.38	1.48	4.55	4.45	1.55
Partial Computer skills	**N**	29	29	29	29	29	29	29	29
	Std. Deviation	.509	.574	.509	.942	.634	.572	.948	.870
	Mean	4.75	4.87	4.75	4.45	1.42	4.77	4.49	1.83
Computer literate	**N**	106	106	106	106	106	106	106	106
	Std. Deviation	.718	.518	.599	.794	.850	.651	.808	1.037
	Mean	4.61	4.70	4.62	4.36	1.55	4.63	4.43	1.84
Total	**N**	145	145	145	145	145	145	145	145
	Std. Deviation	.738	.638	.646	.863	.912	.715	.832	1.032

Source: Authors' computation, 2024.

Again, strong difference in the results from illiterate group compared to other two groups is observed in terms of system availability in Table 31, where both the partial and literate population recorded means are above the sample mean of ≥ 4.37 - 4.67, while the illiterate group results are between 3.40 - 3.50.

When all individuals are considered (regardless of the category in which they belong), the mean scores for each computer literacy feature fall between the means of the computer illiterate and the computer literate categories. Standard deviations for

the overall data are moderate, indicating moderate variability in responses across the entire sample.

Table 31. System availability by computer literacy level.

Computer literacy level		SYS1	SYS2	SYS3	SYS4
Computer illiterate	Mean	3.40	3.50	3.40	3.50
	N	10	10	10	10
	Std. Deviation	.699	.527	.516	.527
Partial Computer skills	Mean	4.41	4.62	4.69	4.69
	N	29	29	29	29
	Std. Deviation	.946	.622	.712	.806
Computer literate	Mean	4.45	4.39	4.79	4.77
	N	106	106	106	106
	Std. Deviation	.745	.738	.581	.606
Total	Mean	4.37	4.37	4.68	4.67
	N	145	145	145	145
	Std. Deviation	.824	.745	.696	.717

Source: Authors' computation, 2024.

Computer literate population, being the dominant population within the sample, has recorded very high scores on the fulfillment questions within a range of 4.58 - 4.81 (for positively formulated questions). Population with partial computer skills is of a rather similar level with the entire sample, while computer illiteracy is still present. Table 32 reports the above findings.

Table 32. Fulfillment by computer literacy level.

Computer literacy level		FUL1	FUL2	FUL3	FUL4	FUL5	FUL6	FUL7
Computer illiterate	Mean	3.30	3.70	3.70	3.80	3.70	3.00	3.40
	N	10	10	10	10	10	10	10
	Std. Deviation	.483	.483	.483	.632	.675	.816	.516
Partial Computer skills	Mean	4.41	4.66	4.31	4.62	4.66	1.41	4.48
	N	29	29	29	29	29	29	29
	Std. Deviation	.983	.814	.660	.728	.614	.628	.871
Computer literate	Mean	4.58	4.75	4.76	4.74	4.71	1.56	4.81
	N	106	106	106	106	106	106	106
	Std. Deviation	.754	.603	.626	.622	.632	.927	.537

Continued

	Mean	4.46	4.66	4.60	4.65	4.63	1.63	4.65
Total	**N**	145	145	145	145	145	145	145
	Std. Deviation	.850	.691	.691	.682	.676	.942	.712

Source: Authors' computation, 2024.

All questions about privacy (and security) exhibit a clear trend where computer literate individuals have the highest mean score, followed by individuals with partial computer skills and then the computer illiterate individuals (Table 33). The overall mean score falls between the means of computer literate and partial computer skills categories.

Table 33. Privacy by computer literacy level.

Computer literacy level		PRI1	PRI2	PRI3
Computer illiterate	**Mean**	3.10	3.00	2.80
	N	10	10	10
	Std. Deviation	.568	.000	.422
Partial Computer skills	**Mean**	3.93	3.55	1.97
	N	29	29	29
	Std. Deviation	.923	.948	.731
Computer literate	**Mean**	4.18	4.07	1.77
	N	106	106	106
	Std. Deviation	.954	1.132	.959
Total	**Mean**	4.06	3.89	1.88
	N	145	145	145
	Std. Deviation	.963	1.100	.924

Source: Authors' computation, 2024.

4.12. Monthly Income

Monthly income is the last social category that has been used for the evaluation of the acceptance of, utilization of, and satisfaction with digital services. The main result in the overall distribution is a very small deviation between the different social groups; an indication that monthly income does not represent a social category that plays a significant role in the usage of digital services. One of the reasons for this finding is the observation of the structure of the monthly income by age, where the youngest people are usually the ones with the lowest revenues, but in this case they are also very well digitally oriented with a high level of acceptance of new technologies.

Individuals with monthly incomes up to EUR 500 have efficiency scores from 4.05 to 4.36. Those earning EUR 500 - 1000 score between 4.38 and 4.54; the EUR 1000 - 2000 group shows scores from 4.57 to 4.92, while the highest income group scores are between 4.30 and 4.94. What we can infer is that higher incomes correlate with higher efficiency scores (Table 34).

Table 34. Efficiency by monthly income.

Monthly income		EFF1	EFF2	EFF3	EFF4	EFF5	EFF6	EFF7	EFF8
up to EUR 500	Mean	4.14	4.05	4.09	4.05	1.86	4.36	4.14	1.86
	N	22	22	22	22	22	22	22	22
	Std. Deviation	.774	.785	.684	.999	.990	.790	.889	.834
EUR 500 - 1000	Mean	4.49	4.54	4.51	4.30	1.84	4.41	4.38	2.03
	N	37	37	37	37	37	37	37	37
	Std. Deviation	.901	.836	.837	1.051	1.143	.896	1.037	1.280
EUR 1000 - 2000	Mean	4.81	4.92	4.81	4.57	1.32	4.92	4.64	1.74
	N	53	53	53	53	53	53	53	53
	Std. Deviation	.521	.267	.395	.665	.803	.267	.558	1.041
above EUR 2000	Mean	4.76	4.94	4.79	4.30	1.39	4.61	4.36	1.79
	N	33	33	33	33	33	33	33	33
	Std. Deviation	.663	.242	.485	.770	.556	.788	.859	.820
Total	Mean	4.61	4.70	4.62	4.36	1.55	4.63	4.43	1.84
	N	145	145	145	145	145	145	145	145
	Std. Deviation	.738	.638	.646	.863	.912	.715	.832	1.032

Source: Authors' computation, 2024.

Again, in Table 35, we can observe that there is a very small difference between the results obtained among different social groups that are divided according to the monthly income. At the sample level, mean results for all questions vary between 4.37 - 4.68 which is below the mean results for efficiency. There is a visible pattern though, that the higher the income, the higher the mean scores across all system availability categories.

Table 35. System availability by monthly income.

Monthly income		SYS1	SYS2	SYS3	SYS4
up to EUR 500	Mean	4.18	4.23	4.23	4.27
	N	22	22	22	22
	Std. Deviation	.907	.752	.813	.767

Continued

EUR 500 - 1000	Mean	4.27	4.46	4.51	4.49
	N	37	37	37	37
	Std. Deviation	1.018	.869	.961	1.070
EUR 1000 - 2000	Mean	4.55	4.38	4.87	4.85
	N	53	53	53	53
	Std. Deviation	.695	.657	.394	.411
above EUR 2000	Mean	4.33	4.36	4.85	4.85
	N	33	33	33	33
	Std. Deviation	.692	.742	.442	.364
Total	Mean	4.37	4.37	4.68	4.67
	N	145	145	145	145
	Std. Deviation	.824	.745	.696	.717

Source: Authors' computation, 2024.

The overall mean ratings for all income groups and systems range from 4.46 to 4.66, with the standard deviations for the total mean ranging from 0.676 to 0.850. The data presented in Table 36 is an indication of moderate variability or dispersion in the ratings within each income group and system.

Table 36. Efficiency by monthly income.

Monthly income		FUL1	FUL2	FUL3	FUL4	FUL5	FUL6	FUL7
up to EUR 500	Mean	4.05	4.41	4.27	4.32	4.32	1.91	3.95
	N	22	22	22	22	22	22	22
	Std. Deviation	.999	.734	.631	.894	.780	.971	1.046
EUR 500 - 1000	Mean	4.38	4.46	4.35	4.57	4.57	1.51	4.59
	N	37	37	37	37	37	37	37
	Std. Deviation	1.063	1.016	.978	.801	.765	.961	.725
EUR 1000 - 2000	Mean	4.66	4.81	4.81	4.79	4.70	1.72	4.87
	N	53	53	53	53	53	53	53
	Std. Deviation	.618	.395	.395	.454	.668	1.099	.394
above EUR 2000	Mean	4.52	4.79	4.76	4.73	4.79	1.42	4.82
	N	33	33	33	33	33	33	33
	Std. Deviation	.712	.485	.561	.626	.415	.502	.528

Continued

	Mean	4.46	4.66	4.60	4.65	4.63	1.63	4.65
Total	N	145	145	145	145	145	145	145
	Std. Deviation	.850	.691	.691	.682	.676	.942	.712

Source: Authors' computation, 2024.

With regards to privacy, in Table 37, we can see that the group with an income of EUR 1000 - 2000 records the highest scores, but the trend that the higher the income is, the higher the scores found in previous categories does not hold here, since the highest paid individuals recorded lower scores on privacy and security concerns.

Table 37. Privacy by monthly income.

Monthly income		PRI1	PRI2	PRI3
up to EUR 500	Mean	3.59	3.59	2.14
	N	22	22	22
	Std. Deviation	1.182	.908	.640
EUR 500 - 1000	Mean	4.11	3.54	1.73
	N	37	37	37
	Std. Deviation	.966	1.169	.871
EUR 1000 - 2000	Mean	4.25	4.26	1.94
	N	53	53	53
	Std. Deviation	.853	.880	1.082
above EUR 2000	Mean	4.00	3.88	1.79
	N	33	33	33
	Std. Deviation	.901	1.293	.857
Total	Mean	4.06	3.89	1.88
	N	145	145	145
	Std. Deviation	.963	1.100	.924

Source: Authors' computation, 2024.

Next, we explored the level of satisfaction per age group by addressing whether there is satisfaction with the E and/or M banking applications' overall performance, whether participants would prefer customized digital solutions, and whether they prefer the use of digital services instead of visiting the bank (Table 38).

Table 38. Level of satisfaction by age in years.

Age in years		I am satisfied with the E and/or M banking application overall performance	I would prefer customized digital solutions	I prefer to use digital services instead of going to the bank
18 - 24	Mean	2.86	1.48	2.90
	N	21	21	21
	Std. Deviation	.359	.750	.436
25 - 44	Mean	2.78	2.00	2.95
	N	76	76	76
	Std. Deviation	.506	.712	.225
45 - 64	Mean	2.76	1.97	2.85
	N	33	33	33
	Std. Deviation	.435	.728	.442
64+	Mean	2.33	2.67	2.33
	N	15	15	15
	Std. Deviation	.488	.617	.617
Total	Mean	2.74	1.99	2.86
	N	145	145	145
	Std. Deviation	.486	.764	.408

Source: Authors' computation, 2024.

The overall satisfaction has a mean of 2.74, with the oldest population exhibiting the lowest and the youngest the highest scores. The mean preference for customized digital solutions is 1.99, indicating that older users might benefit from simpler options. The preference for digital services over visiting banks is 2.86, reflecting their primary usage.

Like previous results, what Table 39 signifies is that the lowest the level of education, the lower the scores, and vice versa; graduate degree category exhibits higher results compared to the sample mean, and other categories are below the sample mean; while the primary education group shows the highest score on customized solutions.

Computers literacy exhibits similar results with the education in general; illiterate persons demonstrate lower scores on the e-services usage satisfaction, thus they prefer to go to the bank, while the highest scores hold for the customized solutions (Table 40).

The smallest difference between the different social categories, with a standard deviation in the range of 0.486 - 0.764, suggests a moderate level of variability in satisfaction across all respondents. This is evident by the data reported in Table 41.

Table 39. Level of satisfaction by level of education.

Level of education		I am satisfied with the E and/or M banking application overall performance	I would prefer customized digital solutions	I prefer to use digital services instead of going to the bank
Primary education	Mean	2.17	2.83	2.50
	N	6	6	6
	Std. Deviation	.408	.408	.548
Secondary education	Mean	2.64	1.95	2.77
	N	22	22	22
	Std. Deviation	.581	.899	.528
Higher education	Mean	2.63	1.83	2.79
	N	24	24	24
	Std. Deviation	.576	.761	.509
Graduate Degree	Mean	2.83	1.98	2.91
	N	93	93	93
	Std. Deviation	.407	.722	.318
Total	Mean	2.74	1.99	2.86
	N	145	145	145
	Std. Deviation	.486	.764	.408

Source: Authors' computation, 2024.

Table 40. Level of satisfaction by computer literacy level.

Computer literacy level		I am satisfied with the E and/or M banking application overall performance	I would prefer customized digital solutions	I prefer to use digital services instead of going to the bank
Computer illiterate	Mean	2.30	2.80	2.30
	N	10	10	10
	Std. Deviation	.483	.422	.675
Partial Computer skills	Mean	2.72	1.79	2.86
	N	29	29	29
	Std. Deviation	.455	.861	.351
Computer literate	Mean	2.78	1.96	2.91
	N	106	106	106
	Std. Deviation	.478	.716	.353

Continued

	Mean	2.74	1.99	2.86
Total	N	145	145	145
	Std. Deviation	.486	.764	.408

Source: Authors' computation, 2024.

Table 41. Level of satisfaction by monthly income.

Monthly income		I am satisfied with the E and/or M banking application overall performance	I would prefer customized digital solutions	I prefer to use digital services instead of going to the bank
	Mean	2.55	2.09	2.64
up to EUR 500	N	22	22	22
	Std. Deviation	.510	.868	.658
	Mean	2.68	1.97	2.81
EUR 500 - 1000	N	37	37	37
	Std. Deviation	.580	.833	.397
	Mean	2.85	1.96	2.92
EUR 1000 - 2000	N	53	53	53
	Std. Deviation	.361	.759	.331
	Mean	2.76	1.97	2.94
above EUR 2000	N	33	33	33
	Std. Deviation	.502	.637	.242
	Mean	2.74	1.99	2.86
Total	N	145	145	145
	Std. Deviation	.486	.764	.408

Source: Authors' computation, 2024.

In summary, the analysis of survey results reveals crucial insights into the digitalization of banking services in Serbia, aligning with the study's initial research objectives. The findings highlight a transformative shift in the banking landscape, where the volume and monetary value of transactions via mobile and electronic channels have significantly increased. This evolution suggests that traditional teller roles may become obsolete as banks explore cashless and peopleless branch models. However, challenges remain, particularly concerning security concerns, which emerged as the foremost issue for many respondents. This underscores the need for enhanced customer trust to facilitate the broader acceptance and utilization of digital banking solutions.

Moreover, the impact of sociodemographic factors such as age, education, computer literacy, and income on digital service usage and perceived quality is pronounced. The results indicate that older individuals exhibit lower levels of engagement with digital banking, while educational background and computer literacy are directly correlated with service adoption. Respondents expressed a clear preference for customized digital solutions, particularly those who are older or have a lower educational level, suggesting that a tiered approach to M-banking could effectively cater to diverse user needs. These findings resonate with existing literature, emphasizing the critical role of demographic factors in shaping digital banking experiences. As the discussion unfolds, it will explore these themes further, considering the implications of these findings for the future of digital banking in Serbia.

5. Discussion

The study's findings offer a comprehensive assessment of the digitalization process in the Serbian banking sector, addressing the three primary research objectives outlined at the outset.

5.1. Transformative Impact of Digitalization

The research affirms that the digitalization of banking services is an ongoing, evolving process, evidenced by the increasing volume and value of mobile and electronic banking transactions. The trend towards peopleless and cashless branches suggests that traditional teller positions may become obsolete, as most transactions can now be executed through electronic channels and intelligent ATMs.

5.2. Challenges in the Digitalization Process

A PEST analysis revealed that sociological and technological factors are paramount in the digitalization of banking services. Our results highlight security concerns as the most significant challenge, surpassing issues related to effectiveness, fulfillment, and system functionality. Addressing the lack of trust in security and privacy is crucial for enhancing acceptance, utilization, and customer satisfaction with digital services (Mehta & Manhas, 2005; Özlen & Djedovic, 2017).

5.3. Social Factors Influencing Digital Banking Adoption

The study confirms the pivotal role of social factors in influencing the usage and acceptance of digital solutions, which ultimately impacts the perceived quality of digital services. Ali (2023) corroborates this finding, noting significant associations between demographic variables (gender, age, education, working status, and household income) and digital banking adoption.

The key findings of the research can be summarized as follows. With regards to Age, the oldest age category shows the lowest levels of utilization and satisfaction with digital services; in terms of Education and Computer Literacy, lower levels

correspond to diminished acceptance and utilization of digital services. Dimitrova (2022) further emphasizes the direct relationship between financial literacy and the digitalization of banking services; Finally, when analyzing the effect of Income, less disparity was observed between income groups, likely due to younger individuals being both in lower income brackets and exhibiting a more tech-savvy behavior. Given Serbia's aging population and predominance of secondary education levels among its population, the overall acceptance and utilization of digital services may be lower than the survey results suggest.

5.4. Tailored Solutions for Diverse User Groups

The survey revealed a preference for customized digital solutions among older individuals (64+), those with primary education, and the computer illiterate. This aligns with Ali's (2023) finding that higher adoption rates can be achieved through systems designed to satisfy different target groups, with simplicity and ease of use playing the most important role.

A strategic proposal emerging from these findings is the introduction of tiered M-banking solutions: A basic package prioritizing user-friendliness with fundamental functionalities; an advanced package offering a broader spectrum of features. This approach could optimize user experience and accessibility across diverse population segments.

5.5. Broader Implications and Future Directions

Jiang & Taşkin (2023) emphasize the importance of considering demographic characteristics and understanding customer demands when developing digital banking strategies. Conversely, Agarwal et al. (2023) highlight that customers engage with digital banking services due to perceived value, such as reduced stress, lower costs, and time savings. To sustain customer trust, financial institutions must proactively address security challenges, prevent fraud, and safeguard the confidentiality of customer transactions and financial information.

In conclusion, this research underscores the complex interplay of social, technological, and security factors in the adoption and satisfaction of digital banking services. Future strategies should focus on tailored solutions, enhanced security measures, and targeted education to bridge the digital divide across diverse demographic groups.

5.6. Contribution to Academia

Digital banking services represent a significant technological advancement in the banking industry. Previous research has largely focused on the impact of digitalization on banking, examining factors influencing the adoption of digital banking services and exploring customer satisfaction and perceptions in markets such as India, New Zealand, and Vietnam. However, there is a notable lack of research on the Serbian banking sector. Since each market has unique characteristics, this paper aimed to fill this gap by providing insights specific to Serbia. The findings do

not only contribute to this underexplored area but also offer broader implications for other fields. This study has attempted to bridge the literature gap and explore the relationship between demographic characteristics, social variables, service quality, and customer satisfaction across various markets.

5.7. Contribution to industry

The introductory section highlighted a prevalent industry trend where many market participants follow a one-size-fits-all strategy. This study's unique contribution lies in its potential to help industry managers make more informed decisions regarding customized and implemented tailored banking solutions. By offering additional insights that might initially be overlooked, this research encourages a more refined approach to decision-making. With the support of these insights, the decision-making process for developing digital services is expected to become more precise, ultimately benefiting the banking industry and its institutions. The anticipated outcomes include higher utilization rates and increased customer satisfaction, positioning banks to extract greater value from their operations.

6. Conclusion

The banking industry, as a key component of the tertiary sector, plays a critical role in driving the economic growth of developing nations. In the Serbian market, competition among banks has intensified due to the large number of participants and the rapid integration of technology into the sector. The ongoing digitalization of banking services offers numerous benefits to both financial institutions and customers, positioning digitalization as a priority on the global development agenda.

Banks are experiencing a fast-paced and unprecedented digital transformation that sets them apart from other financial institutions, a trend closely tied to the widespread digitalization of modern society. A crucial factor influencing the successful digitalization of banking services is the human element, particularly the social categories that define individuals. This study examined the impact of social factors—such as age, education, computer literacy, and monthly income—on the use of and satisfaction with digital banking solutions in the local market.

The analysis highlights that all these factors significantly influence both usage and satisfaction. Specifically, older age, lower educational levels, limited computer literacy, and lower monthly income—especially in combination with lower education—negatively affect the adoption of digital services. On the other hand, individuals with higher education and greater computer literacy tend to use and appreciate these services more.

In conclusion, the process of digital transformation requires strong support from several stakeholders: i) Policymakers, who must establish a regulatory framework that fosters continued development; ii) Business managers, who are essential in innovating solutions, improving the efficiency and security of digital services, and customizing them for diverse customer groups; iii) Individuals, who, as end-users,

need to experience the clear benefits of digital services to increase both their usage and satisfaction.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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