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Utazás a fogyasztói magatartás világában a digitális pénzügyek terén

A journey around consumer behavior in digital finance

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1. INTRODUCTION

In modern finance, the convergence of technology and consumer behavior has reshaped how individuals interact with financial services. The emergence of digital finance represents a pivotal juncture in this ongoing evolution, marked by the proliferation of digital platforms, mobile applications, and innovative financial products. Understanding consumer behavior becomes paramount within this dynamic landscape, a nuanced exploration that lies at the heart of this thesis.

The advent of digital finance signifies a departure from traditional banking paradigms, offering individuals remarkable convenience, accessibility, and flexibility in managing their financial affairs. First and foremost, the research's concept and context need to be understood. Digital finance refers to the integration of digital technologies into traditional financial services, leading to a paradigm shift in financial activity (Singla et al., 2023). This paradigm shift in financial activity resulted in new products, improved customer communications, and data-driven decision-making (Gasiorkiewicz & Monkiewicz, 2023a; Li, 2023; Singla et al., 2023). As part of the digital financial services package, we will find products such as digital banking, digital management and payment services, digital wallets, mobile money transactions, savings, insurance, and lending (Bailur & Smertnik, 2021; Neves et al., 2023a; Wang & Huang, 2023). Fintech, financial behavior in digital environments, and behavioral interventions are three areas where digital financial services affect consumer behavior and money management (Koskelainen et al., 2023).

At its core, this thesis seeks to delve into the complexities of consumer behavior in the context of digital finance. This central research question revolves around understanding the factors that influence individuals' adoption, usage, and satisfaction with digital financial services. By addressing this question, the aim is to identify the key determinants of consumer adoption of digital financial services, including technological factors, trust considerations, and demographic variables, explore the impact of digital finance on consumer financial behaviors, such as saving patterns, spending habits, and investment decisions. And to assess the effectiveness of existing strategies and interventions aimed at promoting digital financial literacy, inclusion, and consumer empowerment.

The understanding of consumer behavior in digital finance has profound implications for a variety of stakeholders, including financial institutions, policymakers, and consumers

themselves. The insights gained from understanding consumer adoption, usage patterns, and financial outcomes can be used to inform decision-making processes, tailor product offerings, and design interventions that resonate with consumers' needs and preferences. The goal of this study is to advance knowledge in the field of digital finance and indicate more inclusive, accessible, and user-centric financial systems.

The subsequent sections of this thesis are structured as follows: Section 2 provides a comprehensive review of relevant literature, synthesizing key concepts, theories, and empirical findings related to consumer behavior in digital finance in the previous years. Section 3 outlines the connection posits between Digital Financial Services and consumer behavior, while in the 4th section presents the research methodology employed in this study, including data collection methods, analytical frameworks, and sample characteristics. Sections 5 and 6 present the results and discussions of our empirical analysis, examining the determinants of consumer behavior and discussing their theoretical and practical implications. Finally, Section 7 and 8 offer a synthesis of our findings, and outlines avenues for future research.

1.1. Problem Statement

The rapid integration of digital technology within the financial sector has drastically changed how consumers engage with financial services, shifting from traditional in-person banking to digital platforms. However, understanding consumer behavior, particularly the factors influencing the adoption and sustained use of digital financial services (DFS), remains a complex issue, especially in Hungary, where diverse demographic and socioeconomic factors affect adoption rates. The problem lies in identifying the barriers and motivators that influence consumers' engagement with digital financial services and understanding the potential demographic divides that may hinder financial inclusion.

1.2. Overall Objective

The primary objective of this study is to identify and analyze the subfactors that influence the adoption of digital financial services in Hungary. This involves evaluating consumer perceptions, technological ease of use, and institutional efforts to promote DFS.

1.3. Specific Aims

- To assess how Perceived Benefit, Security, and User Experience, Promotions, financial literacy and other demographic variables affect DFS engagement among consumers in Hungarian.
- To examine the digital literacy gap among different age groups and its impact on DFS adoption.
- To provide actionable recommendations for financial institutions on improving DFS accessibility and trustworthiness, thereby encouraging broader adoption.

1.4. Importance of the Research

Understanding the factors influencing DFS adoption is critical in an increasingly digital world, where financial inclusion and consumer empowerment rely heavily on access to digital platforms. This research will provide insights that are valuable to financial institutions, policymakers, and stakeholders in Hungary, helping them to design inclusive, secure, and user-friendly digital financial systems. By identifying and addressing the key barriers to DFS adoption, this study contributes to advancing financial inclusion and promoting a more digitally inclusive economy.

2. LITERATURE REVIEW

2.1. The concept of Digital financial services

2.1.1. Historical evolution of the concept “Digital Financial Services”

The evolution of digital financial services (DFS) represents a profound shift in the financial sector, reflecting the broader influence of technology on financial operations and accessibility. Initially emerging from the foundations of electronic finance, DFS has grown into an expansive field that integrates a variety of digital tools, platforms, and services. This transformation has been fueled by rapid technological advancements, shifts in consumer expectations, and a global emphasis on enhancing financial inclusion. To fully understand the significance of DFS today, it is essential to explore its historical development. This section traces the major milestones and trends that have shaped DFS, beginning with the early introduction of electronic communications networks and progressing to contemporary innovations like mobile banking and blockchain technologies. By

analyzing these key developments over time, we gain insight into how DFS has become an integral part of the global financial landscape, presenting new opportunities and challenges for businesses, consumers, and regulators alike.

On one hand in their article, "The Emergence of Electronic Communications Networks in the U.S. Equity Markets", James McAndrews and Chris Stefanadis highlight electronic communications networks (ECNs) as an early form of digital finance. Introduced in the mid-1990s, ECNs are automated trading systems that use software to pair buy and sell orders, facilitating direct transaction matching and execution much like traditional stock exchanges (McAndrews & Stefanadis, 2000). On the other hand, Franklin et al. emphasize that the concept of e-finance is not new, citing earlier innovations such as Fedwire's use of electronic communication technologies starting in 1918 and Nasdaq's integration of electronic stock trading by 1971. What sets the current landscape apart is the dramatically increased reliance on advanced electronic computing and communication compared to previous decades (FRANKLIN et al., 2002).

Initially referred to as electronic finance or e-finance, the term "digital finance" was first comprehensively assessed by Eric Banks in 2001. In his book, *e-finance: The Electronic Revolution*, Banks defines digital finance as the progression of financial services driven by technological advancements. This includes electronic trading, e-commerce risk management, B2B exchanges, e-brokers, and Alternative Trading Systems (ATS), which together present both opportunities and challenges for the financial industry (Erik Banks, 2001). A year later, Franklin, McAndrew, and Trahan expanded on this concept, describing e-finance as the use of electronic methods for financial transactions and services, such as online banking, electronic payments, and digital trading platforms. They positioned digital finance as an evolution of e-finance, emphasizing how it incorporates technologies like mobile banking, blockchain, and digital currencies to transform traditional financial systems. Their work highlights digital finance's potential to enhance financial inclusion and economic growth by providing more accessible services to underserved communities (FRANKLIN et al., 2002). This period marked a shift towards more specific and nuanced definitions of the concept.

The term "e-Finance" has been interpreted in various ways by different authors. According to Petzel (2005), these differences in interpretation stem from the fact that authors approach the concept with different definitions of "electronic" and "finance," resulting in a range of e-Finance

definitions (Petzel, 2005). These varied interpretations of "e-Finance" reflect a broader evolution in the financial sector, leading to the more specific and structured concept of Digital Financial Services (DFS). Hence, Digital financial services (DFS) utilize digital technologies to deliver financial services to consumers. These services hinge on three core components: a digital transaction platform, retail agents, and the use of devices, such as mobile phones, by both customers and agents for conducting transactions (CGAP, 2015; Malady & Buckley, 2015). The underlying digital technology enhances global economic integration, productivity, and efficiency by enabling swift data flow across individuals, corporations, devices, networks, and systems (Roessler, 2018; Aker & Mbiti, 2010).

Digital financial services (DFS) represent a broad spectrum of financial activities made accessible through various digital channels. According to the Alliance for Financial Inclusion (2016), DFS include services such as payments, credit, savings, remittances, and insurance, all of which can be accessed via platforms like the internet, mobile phones, ATMs, POS terminals, NFC-equipped devices, and biometric systems. (AFI, Digital financial services. Basic terminology & Alliance for Financial Inclusion, Basic terminology, 2016). This definition is echoed by the McKinsey Global Institute, which also describes DFS as financial services delivered through mobile phones, computers, cards, or the internet (Manyika et al., 2016).

The core objective of DFS is to advance financial inclusion and alleviate poverty, particularly in developing economies (United Nations, 2016). By providing a broad range of financial services through digital means, DFS can reach underserved populations and enhance economic opportunities. Additionally, DFS contribute to governmental revenue by increasing financial transaction volumes, which can lead to higher tax revenues (Manyika et al., 2016).

However, the rise of DFS also introduces new dynamics in the financial services sector. The industry is facing novel disintermediation and increased competition, which necessitates the creation of customized, intelligent, and cost-efficient products designed to enhance customer experience (Gomber et al., 2017). From a demand-side perspective, the World Bank (2019) highlights that DFS facilitates better management of financial risks and more stable consumption. They also simplify the process for families to receive funds from remote or difficult-to-access sources, thus overcoming infrastructure limitations. (World Bank, 2019)

The roots of digital finance can be traced back to the early 2000s during the dot-com bubble, but it gained substantial traction after the global financial crisis of 2007-2009. During this period, financial institutions began adopting digital tools for a variety of purposes, including cross-border payments, customer account management, cost reduction, and profit maximization (P. Ozili, 2022). As digital transformation continues to reshape the financial landscape, it is seen as the application of modern technology to enhance financial services and improve operational efficiency, particularly in the context of the Fourth Industrial Revolution (Thottoli et al., 2022). DFS now encompasses a broad range of financial tools, services, and channels that use digital technologies to offer customers more efficient and accessible options compared to traditional methods (Iheanachor & Umukoro, 2022). The definition of digital finance has expanded over time, with recent descriptions including a wide array of components such as internet-based services, credit and debit cards, electronic exchange systems, home banking, ATMs, cryptocurrency assets, and mobile applications (Gasiorkiewicz & Monkiewicz, 2023b).

The COVID-19 pandemic further highlighted the importance of digital financial services, as they enabled remote transactions and minimized the need for face-to-face interactions (Neves et al., 2023b). The ongoing digital transformation within the financial services sector is multidisciplinary, involving a wide range of businesses, including banks, financial institutions, investment firms, insurance providers, and mortgage lenders (Thottoli et al., 2023). As digital finance continues to rise in popularity, driven by technological progress, changing consumer preferences, and evolving regulations, it offers numerous benefits such as convenience, accessibility, and efficiency. However, it also presents challenges related to cybersecurity, data privacy, and regulatory compliance (Muslim, 2024). Looking ahead, emerging technologies like blockchain, artificial intelligence (AI), and big data analytics are expected to further transform the financial services industry. This rapid technological evolution necessitates the development of new theoretical frameworks to effectively manage and navigate these advancements (Temitayo Oluwaseun Jejenewa et al., 2024).

To sum up, the progression of digital financial services (DFS) signifies a profound metamorphosis within the financial sector, catalyzed by technological innovations and evolving consumer demands. Originating from the foundations of electronic finance, DFS has expanded to include a diverse array of digital instruments and platforms, such as mobile banking, blockchain,

and electronic trading systems. This evolution has been punctuated by key developments, including the advent of electronic communications networks in the 1990s and the proliferation of digital finance paradigms in the early 21st century. Central to DFS is the goal of advancing financial inclusion, especially among marginalized populations, while simultaneously driving economic growth and operational efficiency. As DFS continues its trajectory, it presents a dual-edged landscape of opportunities and challenges ranging from heightened market competition and the imperative for tailored financial solutions to critical issues surrounding cybersecurity and regulatory adherence. The rapid digital transformation, further expedited by global crises like the COVID-19 pandemic, highlights the pivotal role of DFS in contemporary financial systems, with cutting-edge technologies such as blockchain and artificial intelligence set to further revolutionize the sector.

2.1.2. Fintech and Digital Banking

When exploring the term "DFS," various related concepts emerge, including "Financial Inclusion," "Industry 4.0", "Mobile Money," and "Online Banking". However, the most pertinent and encompassing terms is "Fintech" together with "Digital Banking" which serve as the focus of this section. It was stated by Arner et al. that the term "FinTech" was first introduced in "The Financial Services Technology Consortium" in the early 1990s (Arner et al., 2015), meanwhile it is indicated in "the literature review on the birth of FinTech companies" that there is no definitive date for their establishment (Durak et al., 2024). According to (Beck, 2001), it was founded on Bill Gates' word and this is a reassuring fact. Gates' declaration in 1994 that individuals need banking systems, not banks, serves as an inspiration for the formation of FinTech companies (Bähre et al., 2020; Beck, 2001). Based on this understanding, we can now initiate our exploration into the realm of Fintech. Defines FinTech as firms that use mobile and internet applications to supply financial products and services (Magnuson, 2018). Another interpretation highlights that FinTech services are provided by financial technology businesses that compete with banks (Thakor, 2020). In his article titled "Fintech Innovation: An Overview" Ancri highlights that the term "Fintech" refers to financial technology companies that keep up with technological developments in the financial sector (Ancri, 2016). This evolving landscape is further characterized by the fact that FinTech applications facilitate investment, seamless transactions, and convenience of use in activities such as money (Electronic Funds Transfer) (Durak et al., 2024). Together, these insights illustrate how

fintech not only embodies the intersection of finance and technology but also enhances operational efficiency and user experience in the financial industry.

One of the founders of FinTech Istanbul Platform, (Yazici, 2019) claimed in an interview that FinTech companies will have digital banking licenses in the future. This anticipated shift suggests a growing role for FinTech companies in the financial sector. Furthermore, although banks were not included in the scope of FinTech, they were viewed as institutions capable of offering joint products and services with FinTech companies (Diemers et al., 2015). This collaboration underscores the necessity for innovation and digital adoption within the sector. Rizvi et al. (2024) further assert that innovation, digital adoption, and Fintech are closely linked and play a critical role in shaping the future of financial services and economic growth (Rizvi et al., 2024).

The emergence of financial technology has fundamentally transformed the banking sector, as articulated by Broby (2021), who states, “Financial technology is digitalizing service delivery”. In a more accurate approach, as digital banking evolves, many financial services are accessible and delivered completely via digital means (Lyons & Kass-Hanna, 2021). This is more detailed in the way by which internet banking allows customers to check their account balance, transfer money, and perform online purchases from the comfort of their homes (Hamadi, 2010; Harma & Dubey, 2009; K. C. Lee & Chung, 2009). And yet, in Europe, the internet has become a well-established distribution channel for the banking industry, with both traditional banks and new entrants recognizing its effectiveness over other channels (Barbesino et al., 2005). This digitalization is crucial, as it is making banks more customer centric and more competitive (Broby, 2021). This shift towards a more customer-focused approach is further supported by Gao and Wang (2023), who observe that digital finance significantly positively impacts bank competition, confirming its catfish effect (C. Gao & Wang, 2023). Arriving to the current and crucial fact that digitalizing the customer journey from start to finish with a digital customer-centric approach is the bank's ultimate goal for its digital transformation (Naimi-Sadigh et al., 2022). In other words, as it is described by Timo Cziesla in her research “A literature review on digital transformation in the financial service industry” digital technology is used by the banking sector to demonstrate a strong commitment to customer service (Cziesla, 2014).

FinTech became even more pronounced when the COVID-19 pandemic occurred, to put it differently COVID-19 has caused an acceleration of technology use in almost every part of the

world (Al nawayseh, 2020; Khatun et al., 2021). This acceleration of Technology included the banking sector, and this was all a consequence of adapting to the newly emerging customer demand trends posed by the pandemic. In their article titled “A study of customer perception toward digital banking payment” Bhatt et al. highlighted that the study shows that customers are satisfied with digital banking, especially for saving time and avoiding crowds during pandemics (Bhatt et al., 2023). The post-COVID-19 period continues to find mobile technology to be functional and valuable, as it was during the pandemic in keeping a germ-free atmosphere (Sharifi et al., 2021).

In conclusion, the convergence of fintech and digital banking is redefining the financial industry by promoting efficiency, enhancing customer-centricity, and increasing accessibility. This transformation has shifted banking from traditional, branch-based interactions to seamless digital experiences that meet modern customer expectations. The acceleration of digital adoption, triggered further by global challenges like the COVID-19 pandemic, has shown that digital banking is no longer a supplementary service but a core component of the financial ecosystem. As banks continue to embrace innovation and technology, the goal remains to create an end-to-end digital journey that is not only efficient but also fully aligned with evolving customer needs. This digital-first approach is set to strengthen the sector's resilience, adaptability, and commitment to service excellence in the years ahead.

2.2. Financial Inclusion

Financial inclusion, defined as providing access to affordable, appropriate financial services to underserved populations, has emerged as a key driver of economic development and poverty reduction. In particular, digital financial inclusion, which leverages digital technologies to offer financial services, is transforming the way individuals, particularly in developing economies, engage with the financial system (Tay et al., 2022). The rise of digital financial services (DFS) has facilitated the inclusion of unbanked and underbanked populations by reducing costs, increasing convenience, and broadening access to financial products (Mpofu & Mhlanga, 2022). Key innovations such as mobile banking and mobile payment platforms, exemplified by systems like M-Pesa in Kenya, have played a critical role in expanding financial inclusion by allowing users to perform transactions, save money, and receive remittances without the need for traditional bank accounts (Kim et al., 2018). These services have been particularly transformative in rural and remote areas, where traditional banking infrastructure is limited. Despite the clear benefits, there

are several barriers that continue to hinder the widespread adoption of digital financial services. These include digital literacy gaps, limited access to the internet and digital devices, and concerns regarding data security and privacy (Naumenkova et al., 2019). Addressing these challenges requires concerted efforts from governments, financial institutions, and technology providers to ensure that digital financial products are accessible, user-friendly, and secure.

Furthermore, high levels of FinTech development in Europe have helped reduce the Digital Financial Divide (DFD), boosting e-banking and financial inclusion (Ferilli et al., 2024a). However, the complexity of digital products, particularly during the COVID-19 pandemic, has widened the DFD. Despite technological innovations, customer demand remains unmet due to perceived product complexity and low digital literacy. Addressing these digital and social factors could help reduce disparities in adopting digital banking services. Similarly, the rapid expansion of DFS underscores the growing need for new skills and expertise to navigate the evolving digital economy. (Kamble et al., 2024) suggest that the effective and secure use of digital financial products can only be achieved with sufficient levels of digital financial literacy (DFL), a concept (Lyons & Kass-Hanna, 2021) describe as encompassing financial knowledge, skills, and the ability to leverage digital technologies.

Research also highlights the acceleration of digital financial inclusion in 2021, but significant issues of financial exclusion persist, particularly in developing countries where income levels heavily influence access to financial services (Dluhopolskyi et al., 2023). Durai & Stella emphasize that digital finance significantly enhances financial inclusion by improving mobile banking through usability, convenience, and easy interbank transfers, while low service charges are vital for promoting the use of mobile wallets and credit cards (Durai & Stella, 2019). The authors also stress that tools like internet banking and credit cards are crucial for expanding financial inclusion.

Moreover, the factors influencing financial inclusion extend beyond technological innovations. As (P. K. Ozili, 2021) points out, elements such as financial innovation, poverty levels, financial sector stability, economic state, financial literacy, and differing regulatory frameworks across countries are key determinants. These findings are corroborated by (Mais Sha'ban & Sarkisyan, 2020), who show a general improvement in financial inclusion, particularly in terms of access and usage, and suggest that factors like employment, GDP per capita, bank

competitiveness, and internet usage have favorable relationships with financial inclusion. Their research also stresses that national income levels should be considered when developing policies to enhance financial inclusion.

Digital financial inclusion has also become a critical area of focus in addressing financial exclusion and poverty. It not only supports individual economic well-being but also has broader implications for national economic growth and development (Tay et al., 2022). (Rai & Trivedi, 2020) define financial inclusion as the integration of digital services with finance to provide affordable solutions for basic financial needs like transactions, payments, savings, credit, and insurance. However, subjective financial knowledge, more so than objective knowledge, has been found to correlate more closely with financial well-being, further emphasizing the importance of financial behavior and income levels in shaping overall financial inclusion outcomes (Riitsalu & Murakas, 2019).

In conclusion, while digital financial inclusion offers immense potential to bridge the gap between the banked and unbanked populations, continuous efforts to improve digital financial literacy, address infrastructural barriers, and align technological innovations with customer needs are essential. The increasing role of digital finance tools, combined with the integration of digital services, makes financial inclusion a key pillar for promoting inclusive growth and economic participation. However, as research shows, overcoming challenges related to digital literacy, product complexity, and income inequality remains critical to ensuring that digital financial inclusion is truly equitable and effective in reducing financial exclusion across different economic status (Ferilli et al., 2024a; Kamble et al., 2024; P. K. Ozili, 2021).

2.3. Digital Financial Services in Hungary: Consumer and Market Evolution

The adoption and development of digital financial services (DFS) in Hungary has undergone several phases, reflecting broader trends in technological advancement and consumer behavior shifts. The earliest introduction of digital banking services in Hungary began in the late 1990s, when banks first explored online banking platforms to meet the growing demand for more accessible financial solutions. However, the initial reaction from Hungarian consumers was slow due to limited internet penetration and technological infrastructure at the time (Erjavec et al., 2018). The financial services landscape began to change significantly in the early 2000s as internet

and mobile phone usage became more widespread, providing fertile ground for the adoption of DFS. Hungarian consumers' attitudes towards digital financial services saw a marked shift during the 2010s, particularly after the 2008 global financial crisis, which underscored the need for more efficient and secure financial systems. During this period, banks and financial institutions in Hungary started introducing mobile banking apps, online payment solutions, and FinTech partnerships to enhance customer experiences and reduce operational costs (Somogyvári, 2021). However, older generations were slower to adopt these technologies, with younger, more tech-savvy consumers driving the initial wave of digital banking adoption (Daragmeh et al., 2021).

The onset of the COVID-19 pandemic in 2020 further accelerated the adoption of DFS in Hungary. As lockdowns limited physical access to banking services, there was an exponential increase in the use of digital banking, mobile payments, and contactless transactions. The pandemic acted as a catalyst for many older and previously resistant consumers to embrace digital financial services, and the government's initiatives to promote digital financial inclusion also played a key role in this transformation (Pintér et al., 2021). For instance, instant payment systems and mobile payment platforms, such as SimplePay and OTP Mobil, saw widespread adoption during this period (Fáykiss et al., 2022). Despite these advances, there remain challenges related to digital literacy, especially among older populations and rural residents, which have hindered full-scale adoption of DFS in Hungary. Concerns over cybersecurity, data privacy, and trust in digital platforms continue to be significant barriers, necessitating continuous efforts to enhance financial literacy and confidence in digital solutions (Nagy et al., 2024). Moreover, collaboration between traditional banks and FinTech companies has been crucial in providing more innovative and accessible financial products to underserved communities (Apostu et al., 2023).

Overall, the advancement of digital financial services in Hungary has been characterized by a steady progression in technology, rising consumer trust, and key events like the COVID-19 pandemic that accelerated adoption. However, challenges persist in ensuring these services are accessible to all demographics while upholding security and trust in the system.

2.3.1. Digital Financial Services providers in Hungary

The digitalization of the Hungarian financial sector has been steadily increasing, but the extent of digital adoption varies across different service providers and consumer demographics. While

traditional banks dominate, the FinTech sector is expanding rapidly, providing innovative solutions in areas such as digital payments, mobile banking, and peer-to-peer lending. However, the rise of digital financial services also comes with regulatory complexities that need to be addressed to ensure the safety and reliability of these services for the consumer base.

Digital Transformation of Traditional Financial Institutions

Traditional financial institutions in Hungary, particularly banks, have been undergoing digital transformation to compete with FinTech companies. As highlighted by Tóth (2021), Hungarian banks have made significant progress in digitalizing their services, offering online and mobile banking platforms that provide greater convenience for customers. The COVID-19 pandemic accelerated this shift, as physical bank branches became less accessible. Furthermore, partnerships between banks and FinTech firms are increasingly common as institutions seek to integrate innovative technologies into their existing infrastructure to stay competitive (Tóth, 2021).

Regulatory Challenges and Innovations

Digital financial innovations in Hungary have prompted the need for updated regulations to ensure the stability and security of financial services. Kerényi and Müller (2021) discuss the complexity of navigating the regulatory environment in the Hungarian FinTech landscape, noting that while digital services offer vast potential for innovation, regulatory frameworks must evolve to mitigate risks associated with cyber threats and financial fraud. The regulatory focus has been on ensuring that digital services providers maintain transparency, consumer protection, and data security (Müller & Kerényi, 2021).

Financial Inclusion and Education

FinTech companies in Hungary have also contributed to increased financial inclusion by making financial services more accessible to previously underserved populations. For instance, Tebeli (2021) highlights those digital channels, when aligned with national financial education strategies, can significantly boost financial literacy and inclusion. Digital services help bridge gaps in financial access, but they also introduce new risks, such as digital exclusion for certain demographic groups, particularly older generations and those without adequate digital literacy (Tebeli, 2021).

The Role of FinTech Companies

FinTech companies play a critical role in driving digital financial services in Hungary. As noted by Pavlics (2019), FinTech providers are introducing disruptive technologies that challenge traditional financial services providers by offering faster, more convenient, and cost-effective solutions. Payment processors, peer-to-peer lenders, and mobile wallet providers are particularly influential, leading to shifts in consumer expectations regarding how financial services should be delivered (Pavlics, 2019).

Collaboration Between FinTech and Traditional Institutions

Fehér and Varga (2019) point out that banks are increasingly adopting FinTech innovations to provide services that go beyond traditional banking, such as offering digital platforms for a broader range of financial products. This partnership approach allows banks to leverage the agility and innovation of FinTech firms while providing the stability and trust associated with traditional banking institutions (Feher & Varga, 2019).

In conclusion, digital financial services providers in Hungary, including both FinTech firms and traditional banks, are instrumental in driving the current transformation within the financial sector. While they deliver innovative solutions and broaden access to financial services, there are still challenges, particularly regarding regulatory frameworks and financial inclusion. The partnership between FinTechs and banks is unlocking new opportunities, allowing both sectors to leverage technological innovations to benefit consumers. However, to ensure the long-term success of the digital financial services market in Hungary, it is essential to make these services accessible to all demographic groups while maintaining strong security measures and regulatory compliance.

2.4. Interconnection: Digital Financial Services and Consumer Behavior

Consumer preferences and choices regarding financial products are shaped by a combination of economic, psychological, social, and cultural factors. Economic conditions, such as income, wealth, interest rates, and inflation, influence consumers' ability and willingness to invest or save. Psychological factors, including risk tolerance, trust in financial institutions, and financial literacy, play a significant role in decision-making. Additionally, social influences from family and friends, as well as cultural attitudes toward money, saving, and investing, further guide consumer behavior.

Together, these factors determine how individuals evaluate and select financial products that align with their personal financial goals and social context. (Ghosh, 2024)

Ibrahim and Shahid (2015) highlight that consumer behavior in adopting digital financial services is strongly influenced by perceived risks, ethical practices, and security concerns. Many users view digital platforms as risky, especially regarding data privacy and potential financial loss. Ethical marketing and transparent operations play a crucial role in building trust, as consumers are more likely to adopt services from institutions they perceive as trustworthy. Additionally, financial risks, such as fears of losing money or unauthorized access, create barriers to adoption. Ensuring robust security measures can help alleviate these concerns, encouraging broader use of digital financial services. (Ibrahim & Shahid, 2015)

In his article, Đurđević Babić emphasizes the strong connection between smartphone usage and the adoption of digital financial services, particularly among younger, more educated users. It highlights that frequent smartphone activities correlate with increased engagement in mobile banking, signaling a behavioral shift toward mobile-based financial management. However, trust and security concerns, especially regarding data privacy, remain significant barriers that affect consumer adoption. While younger users are more inclined to use these services, concerns about privacy, complexity, and perceived usefulness still impact widespread acceptance of digital financial platforms. (Đurđević Babić, 2023)

Bourreau & Valletti emphasize the importance of interoperability in driving consumer adoption of digital financial services by allowing seamless transactions across different platforms, thereby enhancing convenience. They also highlight the role of network effects, where the growing number of users increases the utility of the service, encouraging further adoption. Moreover, their study stresses that proper regulatory frameworks that promote competition and interoperability can build consumer trust and shape preferences, especially in markets where trust in financial institutions is limited. (Bourreau & Valletti, 2015)

Lähteenmäki et al., 2022, highlight how digitalization has changed customer value creation in financial services by giving consumers more control and flexibility over their interactions with financial platforms. They show that financial services are now seamlessly integrated into daily activities, such as mobile payments being used in apps for food orders or ride-hailing, which increases convenience. Additionally, the rise of digital ecosystems empowers customers to

combine services from various providers, creating a more personalized and dynamic financial experience, which shapes consumer behavior and preferences. (Lähteenmäki et al., 2022)

Ndiak emphasizes the importance of financial education in shaping consumer behavior, as it equips individuals with the knowledge to make informed decisions about digital financial services. Digital technology also plays a crucial role by providing consumers with access to real-time financial products and data-driven tools, allowing for more personalized decisions. However, the study highlights that the digital divide remains a significant barrier, preventing equitable access to these services for disadvantaged groups. Addressing both cybersecurity risks and digital literacy gaps is key to promoting widespread adoption of digital financial services. (Ndiak, 2024)

The study of Triwibowo & Nurbasith emphasizes the role of digital financial services (DFS) in enhancing financial inclusion, especially during the pandemic, by improving access, usage, and quality of financial services. It shows that the adoption of DFS significantly contributes to socioeconomic improvements, such as reducing poverty and inequality, and highlights the reliability of the Financial Inclusion Index (FII) in measuring this impact. This reinforces the idea that DFS can shape consumer behavior by providing greater financial access and benefits (Triwibowo & Nurbasith, 2023).

Chan et al. (2010) explored the psychological aspects of consumer behavior in relation to DFS, finding that customer participation in the co-creation of financial services significantly enhances their engagement and satisfaction. Their study concluded that consumers who feel involved in shaping their financial products are more likely to remain loyal and make better financial decisions (Chan et al., 2010). Their research points to the growing trend of participatory finance, where consumers are not just passive users but active contributors to the development of digital financial services.

Finally, Gomber et al. (2017) examined the broader fintech revolution, noting that the disruptive nature of digital financial services has fundamentally altered consumer behavior across various financial sectors. Their study highlights how the introduction of DFS has reduced barriers to entry for consumers, making financial services more inclusive and easier to access. This democratization of finance has led to more diverse consumer behaviors, with individuals now able to choose from a wider array of financial products tailored to their needs (Gomber et al., 2017).

In conclusion, this analysis reveals that consumer behavior in digital financial services is shaped by economic, psychological, and cultural factors, with security concerns and trust being critical barriers to adoption. Younger, tech-savvy consumers favor mobile-based financial management, while interoperability and robust regulatory frameworks further support adoption by enhancing convenience and trust. Digital financial services promote financial inclusion by improving access for marginalized communities, signaling a shift toward more personalized and accessible financial experiences. As digital finance evolves, consumer preferences will continue to diversify, with a growing emphasis on user-driven, secure, and accessible solutions.

2.4.1. Determinants of Consumer Adoption of Digital Financial Services

Dependent Variable: DFS adoption

The adoption of Digital Financial Services (DFS) has emerged as a transformative factor in both developing and developed economies, facilitating financial inclusion by providing affordable, accessible, and user-friendly platforms for managing finances. This review discusses key themes and factors influencing the adoption of DFS, including technological infrastructure, socio-economic factors, trust in digital platforms, regulatory frameworks, and the impact of digital identity verification. The adoption of DFS heavily depends on the availability of digital infrastructure such as internet access, mobile networks, and smartphones, with studies highlighting the pivotal role of smartphone penetration and mobile internet connectivity in promoting DFS adoption. For instance, Komandla (Komandla, 2024) identified that the rise of smartphones and advancements in digital verification methods have propelled digital financial inclusion in emerging markets. User trust in DFS platforms is another critical factor, as Pathak & Bansal (Pathak & Bansal, 2024) emphasize that trust in Artificial Intelligence (AI) digital agents used in financial services is directly related to the success of these platforms in the financial sector. Enhancing security features and minimizing the risk of fraud are essential to foster greater trust, particularly in regions where cybersecurity threats are prevalent. Government regulations play a crucial role in DFS adoption, with government initiatives like "Digital India" or the awarding of digital banking licenses in Malaysia (Syed Musa, 2024) being instrumental in driving digital financial inclusion. Clear policies and supportive legal frameworks help accelerate adoption by creating a more conducive environment for financial innovation.

DFS adoption has shown a significant impact on financial inclusion, especially for unbanked and underbanked populations, as a study by (Nyide & Olarewaju, 2023) in peri-urban areas of South Africa found that DFS platforms help marginalized groups gain access to formal financial services. However, socioeconomic factors like education, income levels, and digital literacy still act as barriers to widespread DFS adoption. The digital transformation within the banking sector has also led to significant process innovations, as (Ahmed et al., 2024) discusses how banks are adopting process innovations to stay competitive in a rapidly evolving digital landscape. These innovations, which include mobile banking and internet banking services, help banks reach more customers while reducing operational costs. In conclusion, the adoption of DFS is shaped by a combination of technological, socioeconomic, and regulatory factors, with the availability of mobile and internet infrastructure being a driving factor, while user trust and government policies also play critical roles. Ongoing efforts to secure digital platforms and promote digital literacy will continue to enhance DFS adoption, particularly in underbanked and unbanked communities.

Independent Variables:

- **Perceived Benefits:**

Perceived benefits refer to the extent to which users believe that using digital financial services will enhance their financial operations, such as convenience, efficiency, and cost reduction (Neves et al., 2023b). Consumer adoption of digital financial services is significantly influenced by their perception of the benefits. Studies indicate that users are more likely to adopt these services when they perceive advantages such as cost reductions, time savings, and increased convenience (Mascarenhas et al., 2020). Additionally, economic advantages such as reduced transaction fees and promotional incentives further enhance user interest in digital financial services (Musyaffi et al., 2024). In terms of security, consumers tend to adopt services that offer strong data protection and secure transactions, which in turn builds trust (Zavolokina et al., 2016). Perceived ease of use (PEOD), or how simple consumers find the technology to use, is another crucial factor. Digital financial services that are simple to navigate tend to see higher adoption rates, especially when users find the services to be useful for their personal or business needs (Musyaffi et al., 2024).

- **Security:**

Security, in the realm of digital financial services, involves protecting users' data and financial transactions from risks such as unauthorized access, fraud, and cyberattacks. High security ensures the trustworthiness of a service and can significantly enhance users' confidence in adopting digital financial platforms (Jain & Raman, 2022). Security is a major concern for the adoption of digital financial services. According to Hsu et al. (2011), the perception of security greatly influences users' adoption of mobile financial services. Their research indicates that consumers are less likely to adopt digital financial tools if they fear that their personal information or financial data may be compromised. This is especially important in developing countries where users might not be well-versed in digital security practices (Hsu et al., 2011). Ali et al. (2024) also highlight that enhancing security measures, such as multi-factor authentication and data encryption, can positively influence adoption. Consumers are more likely to use digital financial platforms if they perceive them as secure and reliable. Strengthening these aspects encourages continuous use and builds consumer trust in digital financial services (Ali et al., 2024). Pal et al. (2020) further emphasize that the COVID-19 pandemic accelerated digital financial service adoption but also introduced new security challenges. Their study shows that the increased reliance on digital platforms requires service providers to stay vigilant and continually update their security measures to protect user data and ensure seamless user experiences (Pal et al., 2020).

- **Ease Of Access:**

This refers to how simple and convenient it is for users to access and utilize digital financial services, including user-friendly interfaces and minimal technical barriers (M. C. Lee, 2009). Ease of access is a significant driver in the adoption of digital financial services, especially for underserved populations. A study by Setiawan et al. (2021) found that simplifying the user interface and providing seamless experiences encourage users to adopt digital financial platforms. By minimizing technical difficulties and ensuring intuitive design, digital financial services can expand their user base, particularly in regions with lower levels of digital literacy (Setiawan et al., 2021). Alnemer (2022) identified ease of use as a pivotal factor in the Kingdom of Saudi Arabia's adoption of digital banking services. The study highlighted the importance of reducing friction in processes such as logging in, completing transactions, and integrating with other financial systems. Features like biometric authentication or fast mobile app responses were noted to enhance user

satisfaction and trust in these services (Alnemer, 2022). Yan et al. (2021) emphasized the importance of access during the COVID-19 pandemic, when many people relied on mobile banking to avoid physical transactions. Their research suggests that services offering multilingual support, minimal data requirements, and offline access significantly improve accessibility, which in turn drives adoption (Yan et al., 2023).

- **User Experience:**

User experience encompasses the overall satisfaction and usability that individuals feel when interacting with digital financial platforms. Positive user experience, characterized by intuitive design and efficiency, is a key driver of adoption (Shaikh et al., 2020). User experience (UX) significantly influences the adoption and long-term use of digital financial services. Research by Chauhan et al. (2022) highlighted the importance of a seamless and user-friendly experience in driving customer adoption. According to their study, features such as fast transaction processing, simple navigation, and personalized services were key determinants of a positive user experience, which in turn contributed to greater consumer satisfaction and trust in digital financial services (Chauhan et al., 2022a). Dzogbenuku et al. (2022) conducted a study on digital payments in rural Ghana, emphasizing that user experience needs to cater to both tech-savvy and non-tech-savvy users. The researchers pointed out that a complex or confusing user interface could prevent older users from adopting these services, whereas younger users were more inclined to tolerate minor inefficiencies. Ensuring a smooth and intuitive user interface, especially for first-time users, is crucial for broader adoption (Dzogbenuku et al., 2022). Similarly, Karjaluoto et al. (2019) suggest that perceived value, largely driven by a user-friendly design and seamless interaction, is key to the sustained use of mobile financial apps. Efficient UX not only reduces friction but also improves user trust and perceived convenience (Karjaluoto et al., 2019). Additionally, Pazarbasioglu et al. (2020) highlight that innovations in UX, such as simplified login processes and faster transactions, further contribute to adoption (Alfonso Garcia Mora & Erik Feyen, 2020).

- **Barriers to Use:**

Barriers to use encompass the challenges that inhibit individuals from accessing or adopting digital financial services. These include technological constraints such as unreliable internet connections, high service fees, and complex user interfaces. Psychological barriers, like fear of technology or concerns over data privacy, also contribute to resistance in adoption (Widayani et al., 2022).

Barriers to the adoption of digital financial services include technical difficulties, lack of trust, and financial literacy gaps. As highlighted by Setiawan et al. (2021), financial risk is a significant barrier to fintech adoption in emerging markets. The study found that concerns about financial losses, insufficient regulatory frameworks, and privacy issues discourage potential users, particularly those who are new to digital services. These barriers need to be addressed by enhancing user trust and regulatory support (Setiawan et al., 2021). Manrai et al. (2021) further identified additional barriers, particularly for semi-rural populations in India. According to their research, women in semi-rural areas face barriers such as the complexity of technology, limited digital literacy, and lack of access to digital tools. Their study suggests that overcoming these barriers requires targeted strategies, including educational programs that increase digital literacy and improve the perceived ease of use of digital financial services (Manrai et al., 2021). Dzogbenuku et al. (2022) also noted that infrastructural challenges, such as unreliable internet connectivity and lack of access to smartphones, act as barriers to digital payments in rural areas. These challenges prevent the full adoption of digital financial services, especially in low-income regions. Addressing these barriers by improving infrastructure and ensuring affordable access to devices is crucial for expanding the reach of DFS (Dzogbenuku et al., 2022).

- **Impact of Promotions:**

The Impact of Promotions describes how marketing strategies such as discounts, loyalty programs, and limited time offers drive the adoption of digital financial services. These promotional efforts reduce initial barriers by enhancing perceived value and encouraging trial usage, thus accelerating user acquisition and retention. Promotions play a vital role in shaping consumer attitudes toward digital financial platforms, making them more appealing and reducing user inertia in competitive financial markets (Hoang & Le, 2020).

Promotions significantly affect the adoption of digital financial services by incentivizing users through discounts, cashback, or rewards. Singh (2019) highlights that promotional offers increase user engagement, making services more attractive to potential adopters. These promotions, often linked to mobile wallet or e-payment usage, create a competitive advantage by rewarding customers for trying and continuing to use digital platforms. Such incentives, especially in developing regions, can drive a larger customer base into the digital finance ecosystem (Singh Salhan, 2019). Additionally, Bugvi and Endress (2023) argue that promotions tied to awareness

campaigns are especially effective when paired with educational content. They found that promotional campaigns need to highlight both short-term rewards and long-term benefits, such as security and convenience. By offering financial incentives while educating users on service benefits, promotions can contribute to sustainable growth in digital finance adoption (Bugvi & Endress, 2023). Shaikh et al. (2020) also emphasize the effectiveness of combining promotions with loyalty programs. These schemes not only encourage initial use but also foster customer loyalty, ensuring continuous engagement. The study concludes that when promotions are integrated with tailored services and clear messaging, they significantly enhance adoption rates (Hoang & Le, 2020).

- **Integration with other services:**

Integration with Other Services refers to the seamless and efficient connection between digital financial platforms and a range of other digital services, such as e-commerce, mobile banking, and utility payment systems. This integration enables real-time processing of transactions, data sharing, and account synchronization across different platforms, creating a unified user experience. The ability to interact with various services, including government portals, mobile wallets, and third-party fintech platforms, ensures that users can perform complex financial operations without navigating multiple systems, thereby enhancing ease of use and fostering higher adoption rates (Jünger & Mietzner, 2020). Integration with other services, such as e-commerce platforms, government services, and traditional banking systems, plays a significant role in the adoption of digital financial services across Europe.

According to Marszk and Lechman (2021), integration enhances accessibility and efficiency, leading to higher adoption rates in countries like Hungary and Poland. Their study emphasizes that the seamless integration of digital financial platforms with other everyday services, such as online shopping and utility payments, significantly boosts user satisfaction and increases usage frequency (Marszk & Lechman, 2021). Spilbergs (2023) also explored how integration influences the adoption of digital financial services in the European Union. He argues that the integration of digital technologies within existing financial systems fosters greater financial inclusion and efficiency. In Hungary, the gradual integration of government services, such as tax payments and welfare distributions, with digital financial services has improved adoption by streamlining processes for users (Spilbergs, 2023). In a related study, Mavlutova et al. (2022) highlight that the

interoperability between digital wallets and traditional banking systems in Hungary has improved the adoption of digital financial services. Users benefit from the ability to seamlessly transfer funds between different platforms, reducing friction and enhancing the overall user experience (Mavlutova et al., 2023).

- **Digital Financial Literacy:**

Digital Financial Literacy can be understood as the combination of financial knowledge, digital competencies, and the ability to use technology effectively to manage financial services in an increasingly digitalized world. It includes not only understanding basic financial principles but also being able to navigate digital financial products and services safely and confidently (Andreou & Anyfantaki, 2021). Digital financial literacy is essential for the adoption of digital financial services, particularly in European countries such as Hungary. Kovács and Terták (2019) emphasize that improving digital financial literacy is crucial for closing the digital divide. Their research shows that individuals who are more familiar with financial products and digital technologies are more likely to adopt and continuously use digital financial services.

In Hungary, efforts to raise financial literacy through educational programs have been instrumental in encouraging the adoption of digital financial tools (Kovács & Terták, 2019). A study by Ferilli et al. (2024) also highlights the importance of digital financial literacy in promoting financial inclusion across Europe. The researchers point out that during the COVID-19 pandemic, the need for digital literacy became even more critical as many people transitioned to using digital financial platforms for the first time. In Hungary, educational initiatives that focus on digital literacy have played a key role in facilitating this transition, enabling users to confidently engage with digital financial services (Ferilli et al., 2024a). Additionally, Bayar et al. (2021) found that in the post-communist EU countries, including Hungary, digital financial literacy directly impacts access to and usage of basic financial products. Their findings suggest that improving financial literacy not only helps individuals make informed financial decisions but also fosters trust in digital financial platforms, leading to wider adoption (Bayar et al., 2021).

- **Age:**

Age significantly impacts the adoption of digital financial services, with younger individuals more likely to adopt such services due to their greater familiarity with digital tools. In contrast, older

populations, particularly those over the age of 45, may face barriers such as lower technological literacy or a preference for traditional banking methods. Studies indicate that the likelihood of adopting digital financial services decreases with age, as older individuals tend to perceive higher risks and show resistance to change (Solarz & Adamek, 2022). Age is a significant factor in the adoption of digital financial services, as different age groups exhibit varying levels of comfort and familiarity with technology. Daragmeh et al. (2021) highlight that Generation X in Hungary has shown slower adoption rates for mobile payments compared to younger age groups. Their study indicates that older individuals tend to be more risk-averse and less confident with digital platforms, which affects their willingness to use mobile payments and other digital financial services (Daragmeh et al., 2021).

On the other hand, younger generations, particularly those under 35, are more inclined to adopt fintech solutions as they are more familiar with digital technologies and find mobile payments convenient. Additionally, Spilbergs (2023) found that across the European Union, individuals aged 16-74 have widely varying levels of digital financial service usage. Older adults tend to lag behind younger users, particularly in rural areas where internet penetration is lower. The study emphasizes the need for targeted strategies to increase digital inclusion among older age groups, such as simplifying user interfaces and providing digital literacy programs (Spilbergs, 2023). Another study conducted by Nagy et al. (2024) on neobank services in Hungary also noted age disparities. They found that while younger customers readily adopted digital-only banking platforms, older customers expressed concerns over security and lack of personal interaction, which hindered their adoption of such services. This highlights the importance of trust-building and education initiatives for older populations to encourage broader adoption (Nagy et al., 2024).

- **Gender:**

Gender impacts the adoption of digital financial services, particularly due to social and economic inequalities that influence access and use of technology. Women often face barriers such as limited financial literacy, lack of trust in digital platforms, and fewer opportunities for digital engagement compared to men. This gender gap is significant in both developing and developed economies, highlighting the need for targeted strategies to promote financial inclusion for women (Handa & Taneja, 2021). Gender differences also play a crucial role in the adoption of digital financial services. Research by Daragmeh et al. (2021) indicated that while both men and women in

Hungary are increasingly adopting mobile payments, men tend to be more inclined to experiment with new digital financial services, while women are generally more cautious. The study attributes this difference to varying levels of perceived financial risk and comfort with technology, with men often perceiving mobile payments as a convenient innovation, whereas women may prioritize security (Daragmeh et al., 2021).

Ferilli et al. (2024) examined gender differences across European regions and found that, in most cases, men are more likely to adopt digital banking services than women. The study highlighted the gender digital divide, which is especially evident in Eastern Europe, including Hungary, where traditional banking methods are still preferred by a significant portion of the female population. To bridge this gap, the researchers suggest that financial institutions should target women through educational campaigns focused on digital financial literacy and addressing concerns over security (Ferilli et al., 2024b). In another study, Bayar et al. (2021) explored the impact of gender on financial inclusion in post-communist countries, including Hungary. They found that gender disparities persist in digital financial services usage, with women being less likely to use online banking services. The study stresses the importance of policy interventions aimed at improving financial literacy among women and increasing their confidence in using digital financial tools (Bayar et al., 2021).

3. METHODOLOGY

Research Design

Creswell (2009) defines research design as a framework that integrates numerous components to meet a research topic (Creswell, 2009). In this study, a mixed-methods design was used, which combined qualitative and quantitative approaches. Creswell argues that mixed methods research integrates statistical data and narratives to provide a comprehensive knowledge of a phenomenon by combining numerical patterns with participant insights.

The quantitative strategy in this study entailed delivering structured surveys to DFS customers, while the qualitative component involved conducting semi-structured interviews with bank managers. Bryman (2016) underlines that mixed methods can provide a more nuanced understanding by resolving the limitations inherent in single-method designs. This methodology

is suitable for examining both consumer behavior and managerial insights within the DFS domain (Bryman, 2016).

3.1. Literature Review

A literature review is essential for academic research since it identifies gaps, refines research topics, and provides theoretical context (Bryman, 2016). It entails rigorously analyzing and integrating prior study data to identify significant characteristics such as digital literacy, perceived security, and consumer involvement.

In this study, the literature review covered academic publications, reports, and studies on digital finance, consumer behavior, and fintech acceptance. This technique helped discover repeating themes and gaps, which aided in the development of research tools. Creswell (2009) emphasizes mapping important themes and synthesizing results to support the study's conceptual framework.

The research began with a thorough literature review of a wide range of international and local studies to establish a theoretical framework and gain insights into existing research on digital financial services and consumer behavior. This review focused on academic articles, journals, reports, and books covering topics such as digital banking, fintech adoption, and factors influencing consumer behavior. The findings from the literature review helped identify key variables for further investigation through questionnaires and interviews.

3.2. In-Depth Interviews

Purpose and approach

Interviews are an important qualitative data collection strategy that allows researchers to explore people's experiences and perspectives in depth (Kvale, 2011). This study employed semi-structured interviews, which combine open-ended inquiry with pre-planned questions, to collect thorough insights of DFS adoption from the perspectives of bank management.

According to Kvale, interviews should be treated as purposeful discourses in which the interviewer supports a discourse to generate meaningful responses. The semi-structured framework enables flexibility while maintaining a thematic focus. This study employed an iterative coding approach

to identify trends and categories, which were then combined into larger subjects such as digital literacy challenges and security concerns.

Kvale's guidelines recommend:

- Asking open-ended questions to generate thorough responses.
- Engaging in active listening and asking clarifying questions.

Data Collection and Analysis

For this study, semi-structured interviews were selected as the primary data collection method to gain an in-depth understanding of Hungarian bank managers' perspectives (they preferred to stay anonymous) on digital banking adoption. This approach allowed for flexibility in exploring individual viewpoints and extracting nuanced insights that might not emerge through structured methods alone. The responses collection period took place from September till the middle of October. The choice of interviews was motivated by the need to capture complex themes, particularly regarding barriers, strategies, and contextual factors influencing digital banking in a rapidly evolving financial landscape.

A purposive sampling strategy was employed, targeting 4 bank managers with direct experience and insight into digital banking processes and client interactions. These participants were chosen based on their roles, as their responsibilities encompass critical decisions related to digital banking transformation and customer engagement strategies. This targeted selection ensured that the data collected would be rich in relevance, directly aligned with the research objectives, and reflective of current banking practices. The interviews were conducted in Hungarian language, my supervisor who is an associate professor Károly Szóka at the University of Sopron assisted by collecting the interviewees responses in person due to the language barrier.

Following data collection, the interview responses were transcribed and analyzed through thematic analysis. The data was coded manually (**See Table 1**) to identify recurring patterns, concepts, and themes. The initial coding process involved open coding to categorize individual responses, followed by axial coding to connect related codes and uncover broader themes. Key themes identified included digital literacy barriers, customer preferences for in-person services, corporate versus retail digital service challenges, and strategies for enhancing customer

engagement. These themes were then synthesized to provide a cohesive understanding of the barriers and opportunities within digital banking as perceived by the managers.

Theme	Codes	Number of mentions
Barriers to Digital Adoption	Digital literacy gap, device availability	5
Popular Digital Services	Mobile app, online banking, virtual account opening	4
Strategies for Engagement	User education, online marketing, mobile-first	6
Corporate vs. Retail Differences	Manual loan processes, corporate transaction systems	3

Table 1 Coding Framework for Thematic Analysis of Interview Responses

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

3.3. Questionnaire

Questionnaires are a popular quantitative research method for gathering data from a broad sample of participants and identifying trends and patterns in responses (Bryman, 2016). The goal of employing a questionnaire in this study is to gather information about consumer attitudes and behaviors regarding digital financial services (DFS) adoption in Hungary. The questionnaire was meant to be user-friendly, with clear and simple language to prevent confusion and answer bias, as per Bryman (2016). A combination of Likert-scale and closed-ended questions allowed for both depth and ease of analysis, effectively quantifying subjective experiences.

The research examines factors influencing the adoption and acceptance of Digital Financial Services (DFS) among the general population in Hungary. The questionnaire included both closed-ended and Likert scale questions to assess factors such as security concerns, user experience, customer support experience, impact of promotions, integration with other services and financial literacy. Utilizing a combination of random sampling, the study targeted individuals aged 18 and above, aiming for a broad demographic reach. An e-questionnaire was distributed online via Facebook, University WhatsApp group and Microsoft Teams in both English and Hungarian from

August 12 to October 4, 2024, and comprised two sections: demographic information focusing on gender, age, and place of residence, and research questions focusing on adoption and usage as our dependent variable and perceived benefits, security, User Experience and Satisfaction, Preferred Digital Financial Service, barriers to use, Impact of Promotions, Customer Support Experience, Integration with Other Services, and Digital Financial Literacy as our Independent variables. Data from 186 respondents were analyzed in Excel.

Ethical Considerations

Ethical considerations were paramount in conducting these interviews. Participants were fully informed about the study's purpose, the nature of their involvement, and the anticipated use of their responses. Consent was obtained from each participant prior to conducting the interviews, ensuring voluntary and informed participation. Additionally, measures were taken to protect participant confidentiality and anonymity. Identifying information was excluded from all records, and responses were reported in aggregate form or anonymized to prevent attribution to specific individuals. These practices align with ethical standards to respect participant privacy and foster an environment of trust essential for gathering candid insights.

3.4. Data Analysis

In this study, frequency analysis was selected as the primary quantitative method, as it provided sufficient insights to address the core research objectives. By focusing on the frequency distribution of responses, I was able to identify meaningful trends and patterns in consumer behavior, which are essential for understanding the broader implications within digital financial services. This approach aligns well with the study's exploratory nature, where in-depth statistical methods were not necessary to capture the primary trends. Moreover, the combination of frequency analysis with qualitative insights from interviews enriched the findings by adding context and depth, while the literature review offered a robust theoretical foundation. Together, these elements create a comprehensive analysis that adequately meets the study's objectives.

In addition to frequency analysis, a Chi-Square Test of Independence (χ^2) was used to examine the relationships between demographic variables and the other 10 variables in the study. This test checks whether the differences between observed and expected values suggest a meaningful association. A larger χ^2 value indicates a stronger relationship. The degrees of freedom (df) help

determine the statistical significance, and a p-value below 0.05 indicates that the association is unlikely to be due to chance. To measure how strong the association is, Cramér's V was used, with values ranging from 0 (no association) to 1 (perfect association). This approach provided additional insight into the strength of the observed relationships (Kearney, 2017; Mchugh, 2013; Sellke, 2017).

The Pearson chi-squared (χ^2) statistic, developed by Karl Pearson, is used to assess relationships between categorical variables, with values starting from 0. While effective for nominal variables, its power decreases when evaluating ordinal variables. Unlike correlation measures, χ^2 has no upper limit. Cramér's V (VC), ranging from 0 to 1, provides an effect size measure, making it easier to interpret nominal associations, with higher values indicating stronger relationships. Chi-squared tests are non-parametric, robust to data distribution, and do not require equal variances or homoscedasticity, making them suitable for both two-group and multi-group comparisons.

The chi-squared test offers several advantages, including its simplicity, flexibility, and ability to provide detailed information about group performance. It is commonly used in studies where parametric assumptions cannot be met. However, the test requires a large sample size and becomes difficult to interpret when variables have more than 20 categories. Pairing χ^2 with effect size metrics like Cramér's V improves the clarity and depth of interpretation.

4. RESULTS

4.1. In-depth interview results

Through interviews with four bank managers, several key insights were obtained regarding the current state of digital financial services, consumer adoption, and the challenges and strategies banks face in promoting digitalization. The managers highlighted a variety of themes concerning consumer behavior, service offerings, and the challenges of digitization for both consumer and corporate clients.

Consumer Adoption of Digital Services

Managers across the banks reported a high adoption rate of digital services, particularly among younger clients. Mobile applications, internet banking, and digital account services are among the most used services. Consumers appreciate the convenience, speed, and cost-saving benefits of

digital banking. One manager stated: "Eighty percent of our transactions now happen through digital channels, and paper-based processes are almost entirely eliminated".

Barriers to Digital Adoption

Despite the overall positive trend, managers cited significant barriers for older customers, including a lack of digital literacy and device availability. Several managers also noted that older clients still prefer face-to-face interactions due to a lack of familiarity with mobile devices or online banking systems. As one interviewee noted: "The older generation often lacks the necessary skills to confidently navigate digital banking services".

Corporate vs. Retail Digital Services

The digitalization of banking services for corporate clients lags behind that for retail customers. While 99% of basic transactions, such as transfers and deposits, can be performed online, managers noted that corporate clients often require in-person meetings for more complex services like loans. For example, one manager explained: "Corporate loans still require personal meetings, though smaller transactions are fully digital".

Popular Digital Services

Across all interviews, the most popular services for retail customers included mobile app usage for checking balances, making transfers, and paying utility bills. Online account opening and quick access to digital cards were also widely used. One manager highlighted: "Our mobile app is the most widely used service, with customers relying on it for balance checks, transfers, and bill payments".

Strategies for Enhancing Digital Engagement

To overcome barriers and increase engagement, banks have implemented various strategies, such as providing in-branch demonstrations of mobile applications, offering customer education, and focusing on mobile-first design. Future strategies include the introduction of AI-powered digital assistants and further system enhancements. One manager emphasized: "We show clients how to use the app in the branch, which is one of our key responsibilities".

4.2. Questionnaire results

4.2.1. Frequency analysis

- **Demographic Characteristics of Respondents**

The study surveyed a diverse group of participants, with demographic characteristics as follows:

Gender: (Figure 1) Female respondents comprised 57% of the sample, while males accounted for 42%. With one participant selected "Prefer not to say."

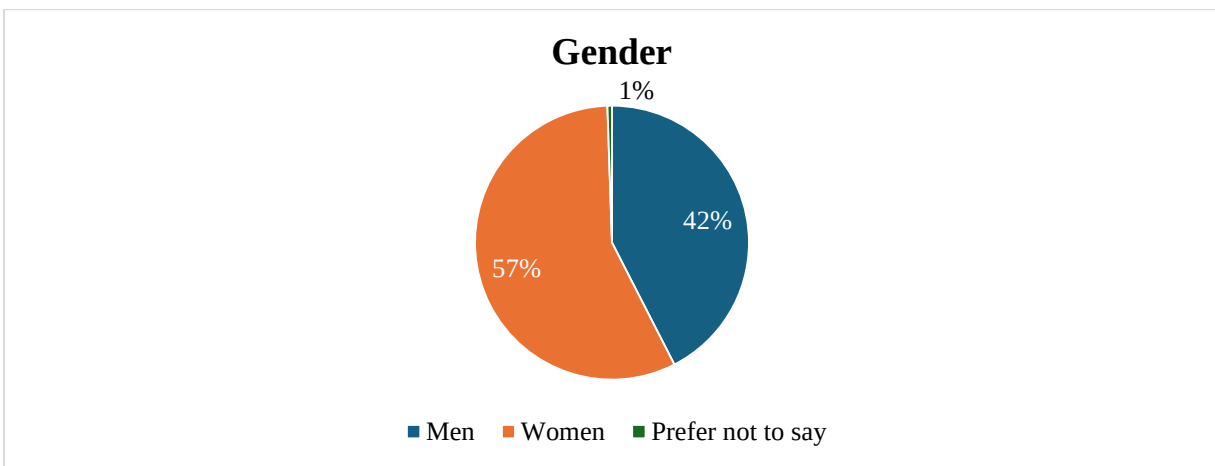


Figure 1 Gender Distribution of Survey Respondents

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

Age Distribution: (Figure 2) The respondent base was predominantly young, with 58% aged 18-25 and 16% aged 26-35 with another group included 16% aged 36-45. Other age groups represented a minority of 7% aged 46-55, and 3% over 55, reflecting strong engagement among early adults and indicating a younger demographic appeal for digital financial services.

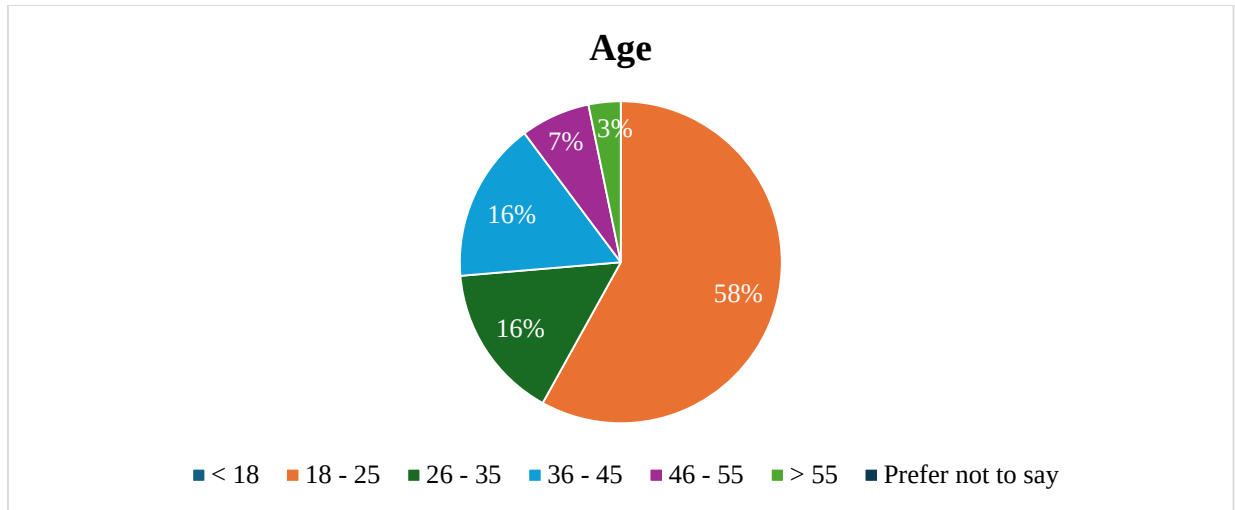


Figure 2 Age Distribution of Survey Respondents

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

Place of Residence: (Figure 3) Most respondents resided in smaller communities, with 36% from small towns, 26% from larger cities, and 24% from villages. Only 12% were from the capital, and 2% preferred not to disclose their location, suggesting that digital financial services are reaching a primarily rural and small-town population.

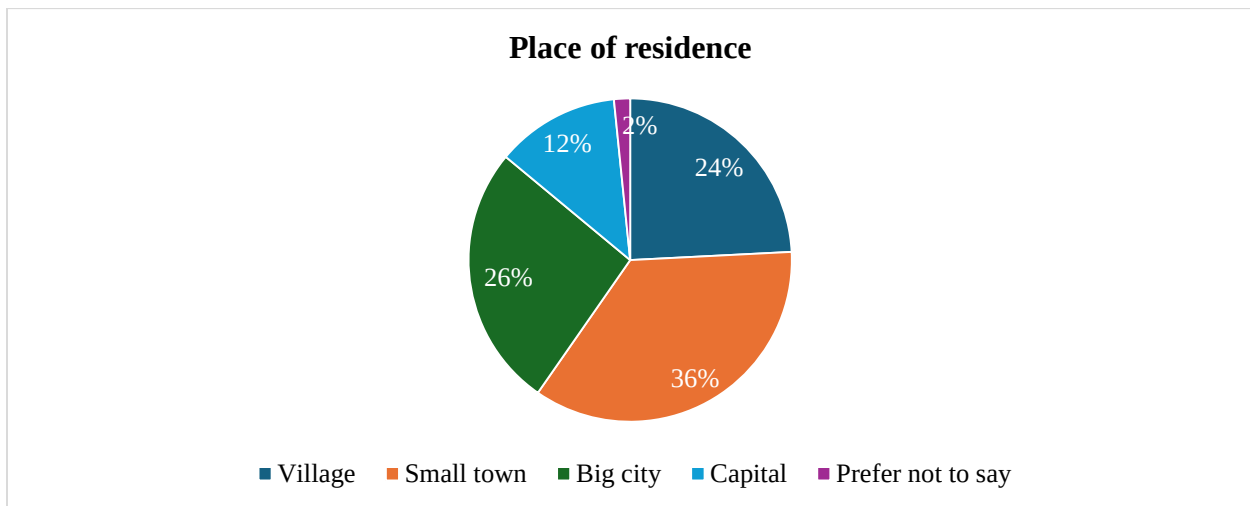


Figure 3 Place of Residence of Survey Respondents

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

- **Adoption and Usage Patterns of Digital Financial Services (DFS)**

The **Figure 4** illustrates the adoption and frequency of usage of various digital financial services in Hungary. It categorizes usage frequencies as Daily, Weekly, Monthly, Rarely, and Never across platforms such as OTP SmartBank, Google Pay, Apple Pay, PayPal, and others.

High-Engagement Platforms: “Revolut, PayPal, Barion” 35% and “Google Pay, Apple Pay, Otpay (by OTP Bank)” 32% with “OTP SmartBank” 30% had the highest daily usage rates, with 89% of respondents using these services daily. This high engagement reflects user preference for accessible, frequently used platforms in daily financial activities.

Low-Engagement Platforms: In contrast, platforms such as Erste MobileBank, iCredit, K&H Mobilbank were seldom used, with the majority reporting infrequent or no engagement. Similarly, myRaiffeisen and other Financial Services showed low usage, with a huge number of respondents indicating rare or no interaction, underscoring selective adoption toward widely accessible and integrated services.

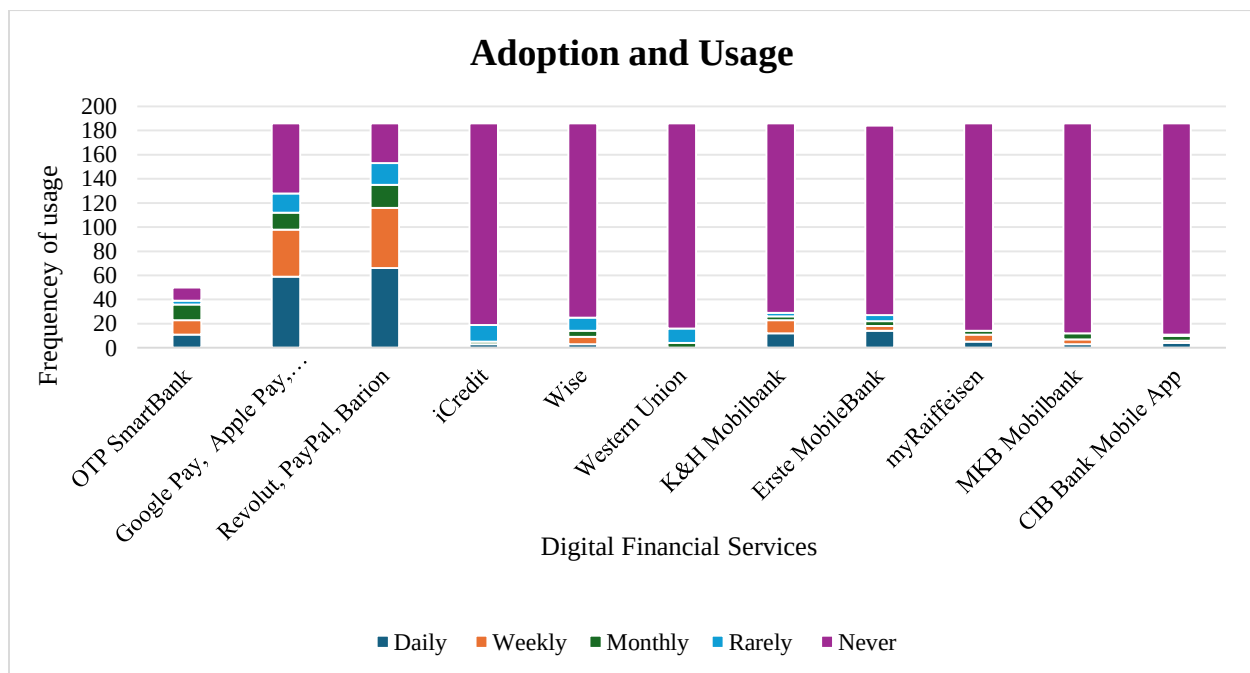


Figure 4 Adoption and Usage frequencies of Digital Financial Services in Hungary

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

- **Perceived Benefits of Digital Financial Services**

Key benefits perceived by users align with preferences for simplicity and accessibility (**Figure 5**):

Primary Benefits: Convenience of Use (47%) and Ease of Access (27%) emerged as top-rated benefits, reflecting strong user demand for streamlined and readily accessible financial tools. These factors suggest that ease of engagement is a primary driver of DFS adoption.

Secondary Benefits: Faster Transaction Times (13%) and Lower Transaction Costs (7%) held additional appeal, though they were secondary motivators. Minimal emphasis was placed on Enhanced Security Features and Access to Additional Financial Tools (each at 2%), suggesting these aspects are less impactful on user decisions.

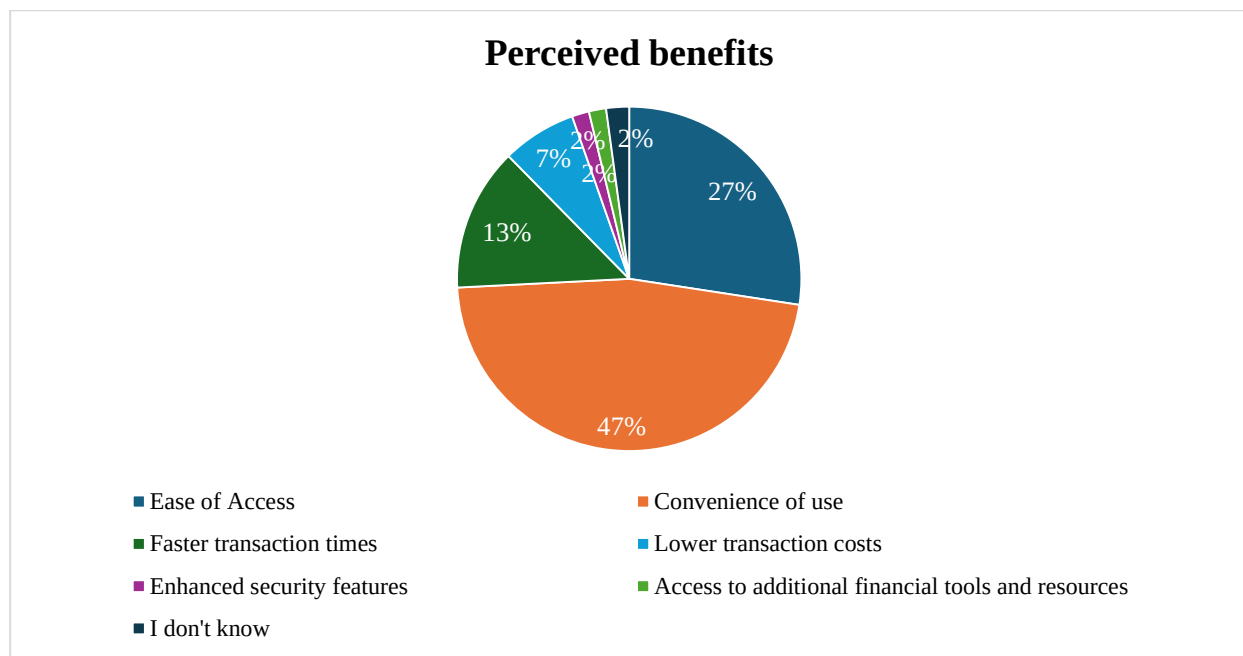


Figure 5 Perceived Benefits of Digital Financial Services

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

- **Security Concerns**

Security emerged as a nuanced factor in DFS adoption (**Figure 6**):

Levels of Concern: Security concerns varied, with 41% of respondents "Somewhat Concerned" and 17% "Very Concerned," pointing to significant awareness regarding security risks in DFS usage. On the other hand, 32% reported being "Not Very Concerned," and 10% "Not Concerned"

at All," suggesting a range of perspectives on security. Only 1 respondent expressed uncertainty, indicating limited unfamiliarity with security issues.

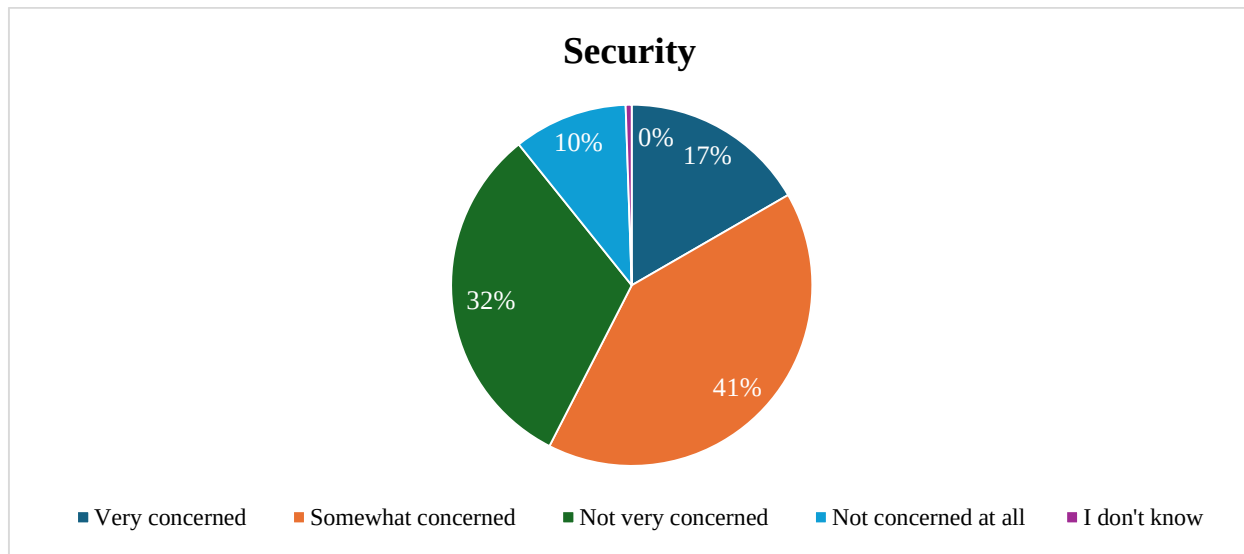


Figure 6 Consumer Concerns About Security

Source: Own Data prepared via Excel.

- **User Experience and Satisfaction**

Overall satisfaction with DFS usage was notably high (**Figure 7**):

Positive Feedback: A substantial 61% of respondents indicated being "Satisfied" with their DFS experiences, while 19% were "Very Satisfied," totaling 80% positive feedback. Neutral responses were 17%, while dissatisfaction was minimal, with only 1% reporting dissatisfaction, 1% very dissatisfied and 1% selected I don't know. This distribution points to a generally positive user experience across the sample.

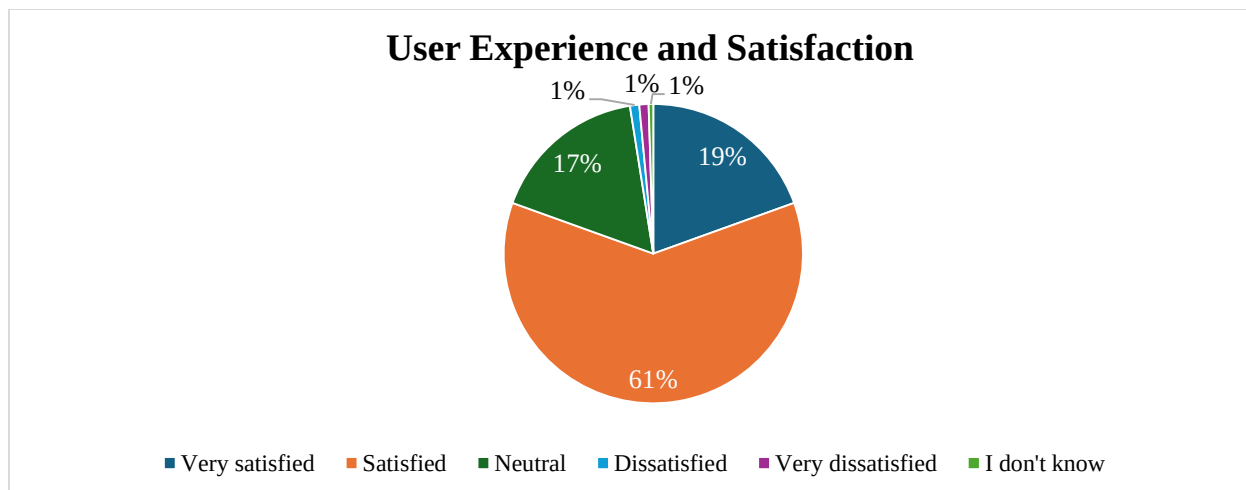


Figure 8 User Experience and Satisfaction

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

- **Preferred Digital Financial Services**

Patterns in platform preference were evident among users (**Figure 9**):

Mobile Banking Apps: The highest engagement levels were seen with mobile banking apps, with 42% using them daily and 38% weekly. This frequency underscores their essential role in managing everyday financial transactions.

Selective Use of Digital Wallets: Digital wallets also showed strong daily engagement (38%), although 34% of users reported never using them, indicating selective adoption.

Limited Interest in Cryptocurrency Exchanges: Cryptocurrency platforms were among the least used, with 85% of respondents reporting no engagement, highlighting limited appeal within this demographic.

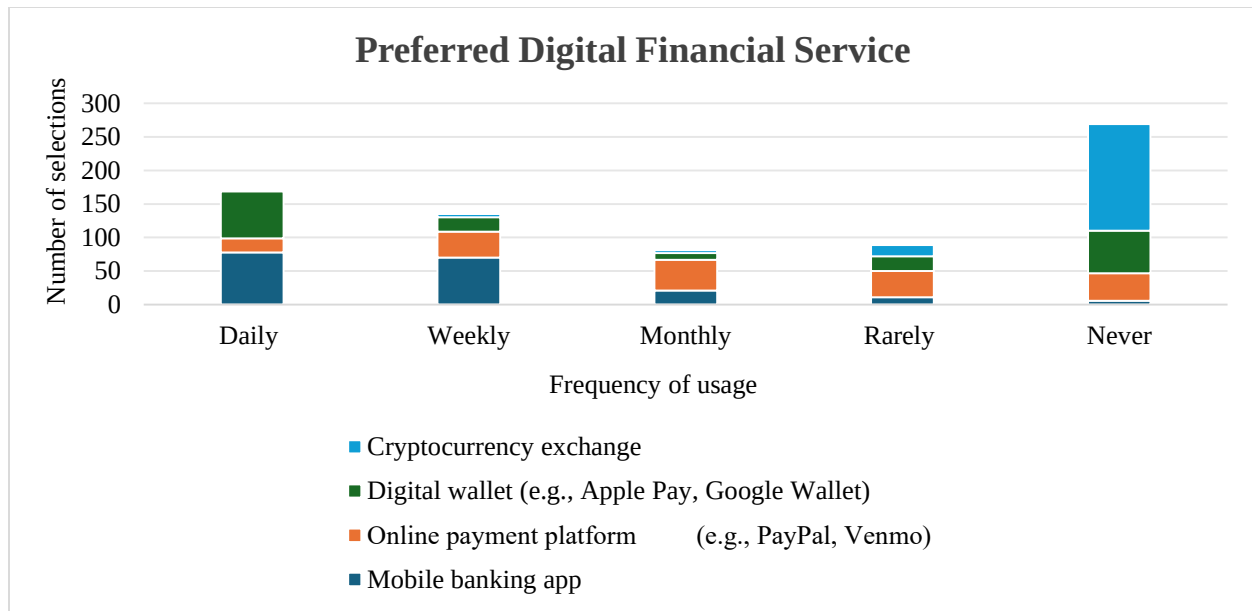


Figure 10 Frequency of Preferred Digital Financial Service Usage

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

- **Barriers to Digital Financial Service Use**

Barriers to DFS adoption centered on accessibility and knowledge gaps (**Figure 11**):

Primary Barriers: The most cited barriers included “I don’t know,” highlighting uncertainty or disengagement with DFS (32%) highlighting uncertainty or disengagement with DFS. Additionally, Limited Internet Access (18%) and Lack of Knowledge (17%), indicating that challenges in connectivity and understanding may hinder broader DFS adoption.

Additional Concerns: Complexity of Use (13%) and safety and trust concerns (11%) and lastly Preference for Traditional Banking (9%) were also reported as challenges, signaling some resistance to transitioning from traditional financial methods.

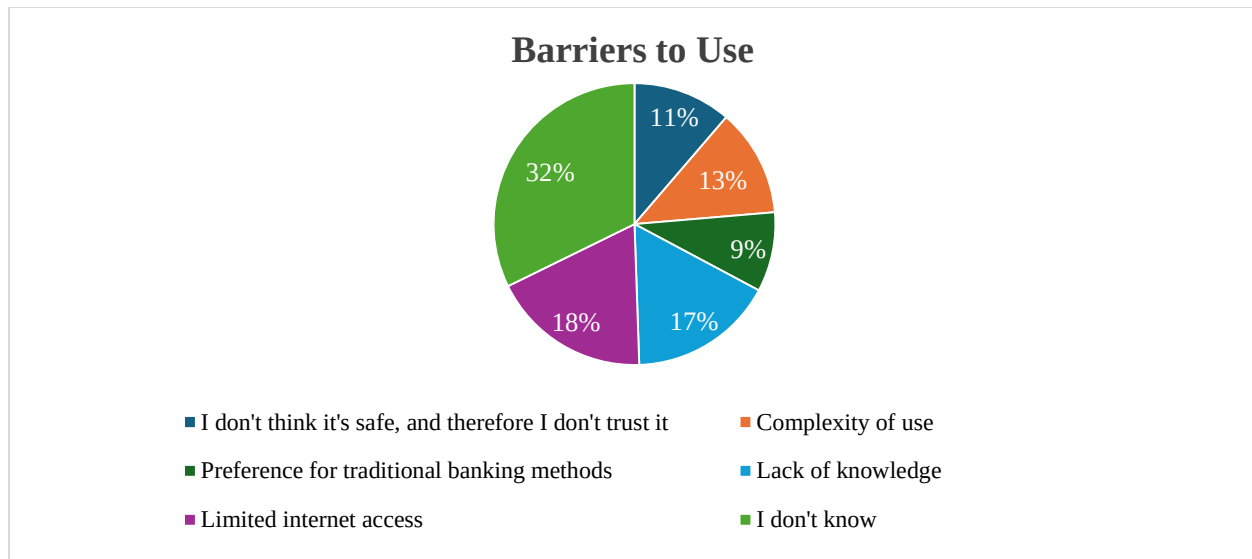


Figure 12 Barriers to Digital Financial Service Adoption

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

- **Impact of Promotions**

Promotional activities had varied but notable influences on adoption decisions (**Figure 13**):

Promotional Influence: Over one-third of respondents were positively influenced by promotions, with 35% “Likely” and 13% “Very Likely” to respond to promotional offers. Meanwhile, 30% remained neutral, with a minority 10% “Unlikely” and 10% “Very Unlikely” indicating that promotions were less impactful. Only 2% expressed uncertainty, suggesting that targeted promotional efforts may enhance adoption rates.

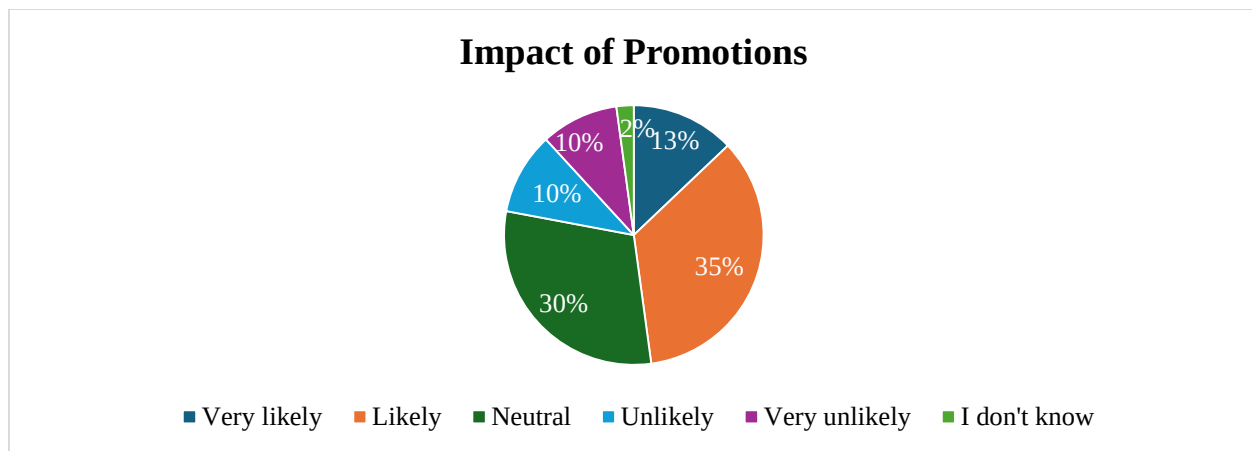


Figure 14 Impact of Promotions on Digital Financial Service Adoption

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

- **Customer Support Experience**

Feedback on customer support quality was generally favorable (**Figure 11**):

Satisfaction with Support: Customer support services received positive ratings, with 43% rating their experience as “Good” and 16% as “Excellent.” An additional 27% rated support as “Average,” while only 4% reported dissatisfaction. A small group, 10% selected “I don’t know,” reflecting moderate uncertainty about support quality.

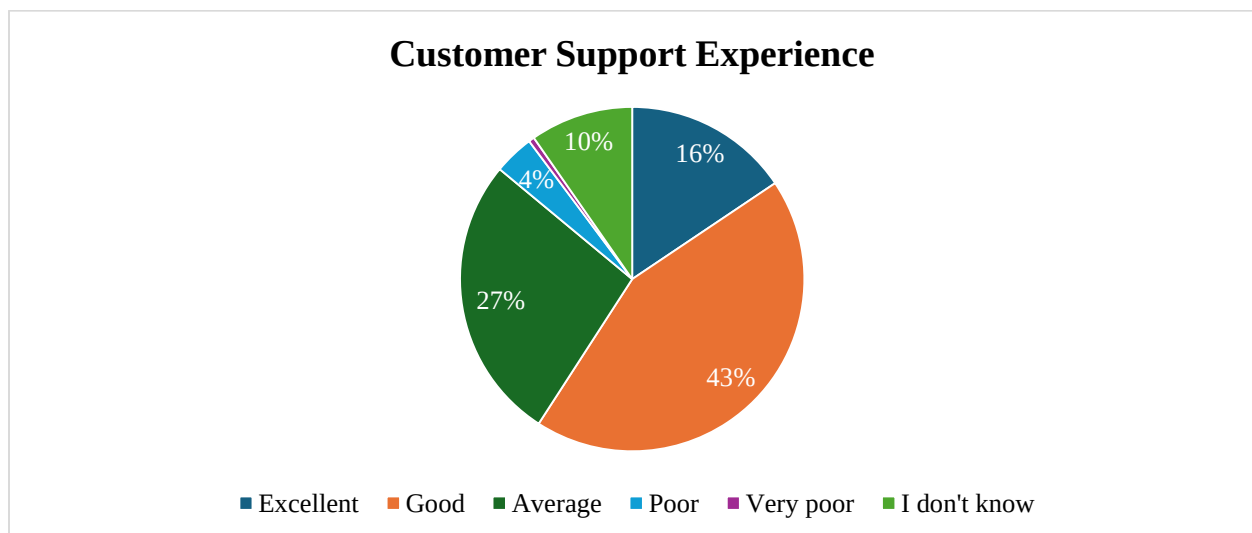


Figure 15 Customer Support Experience in Digital Financial Services

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

- **Integration with Other Services**

Integration with other services was highly valued among users (**Figure 12**):

Importance of Integration: Many respondents (60%) rated integration as “Important” or “Very Important,” with 39% and 21% respectively, suggesting that the ability to use DFS alongside other tools or accounts is a key user priority. A significant portion of respondents were neutral with 28%, a value that points out less awareness of the relevant benefits of Financial Services integration with other services. A smaller portion rated it as less important (4%) or not important at all (2%).

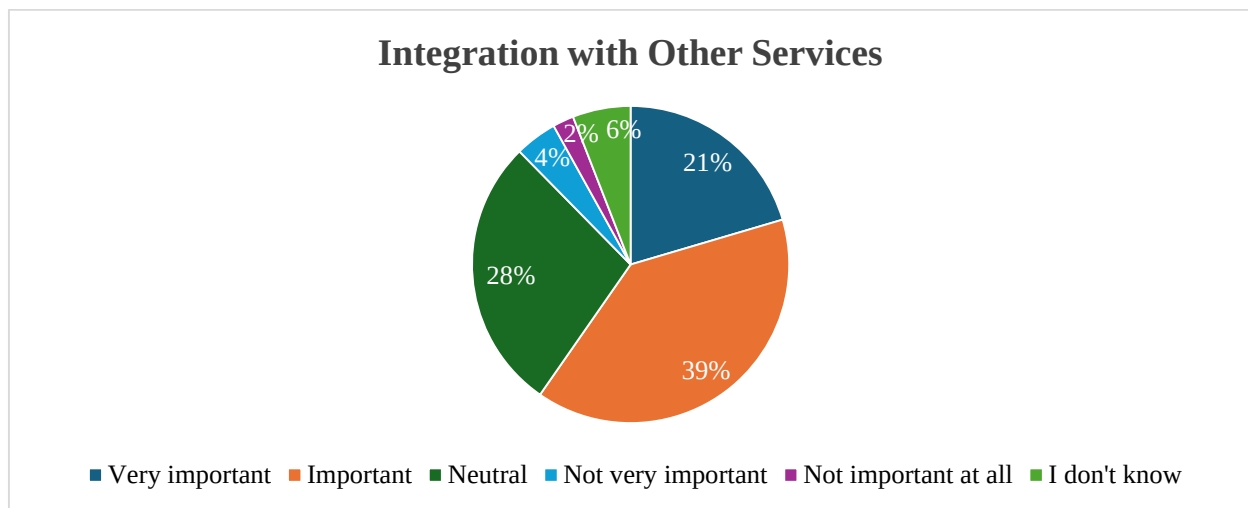


Figure 16 Importance of Integration with Other Services

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

- **Digital Financial Literacy**

Findings reveal a moderate level of digital financial literacy among users (**Figure 17**):

Literacy Levels: Most respondents demonstrated at least some familiarity with digital financial concepts, with 18% “Very Informed” and 51% “Somewhat Informed”. Conversely, 18% were “Neutral”, 11% were “Not Very Informed” and almost 0% “Not Informed at All” while 2% were uncertain. These results indicate a generally informed user base, though some gaps in knowledge

remain.

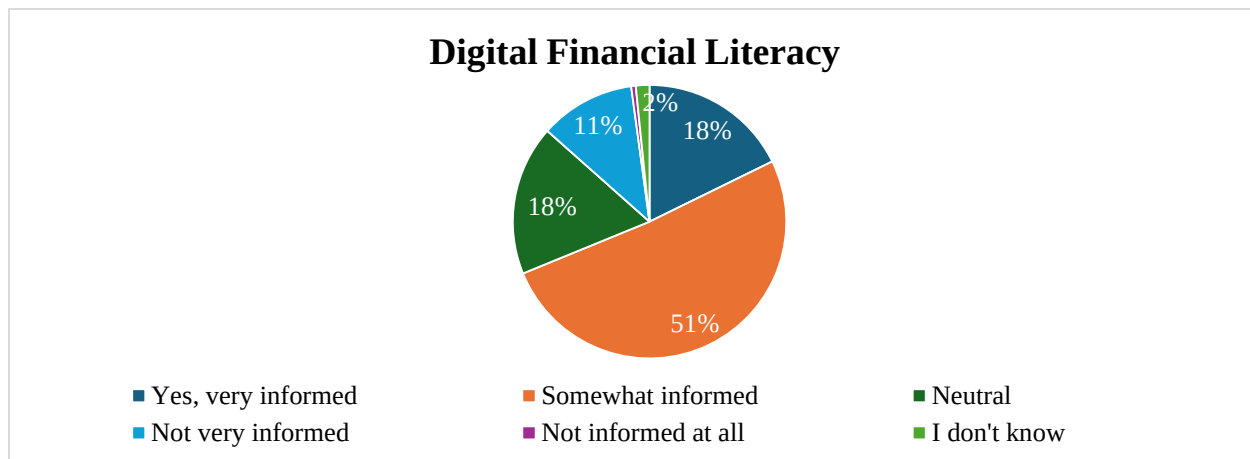


Figure 18 Digital Financial Literacy Among Survey Respondents

Source: Own editing, based on the in-depth-interviews, data prepared via Excel.

- **Key Trends and Insights**

Several patterns emerged from the data:

Higher Engagement among Younger Demographics: Younger adults (18-25) were the most active DFS users, underscoring the appeal of digital finance solutions for early adults.

Security Concerns and Accessibility Barriers: While convenience is a significant motivator, security concerns and barriers to accessibility remain factors influencing adoption.

Promotions and Integration Drive Adoption: Promotional strategies and service integration appear to positively impact engagement, suggesting that these factors are vital for increasing adoption rates.

- **Summary of findings**

The results indicate a user preference for accessible, straightforward digital finance options, with high engagement driven by convenience and accessibility. Security remains a moderate barrier, particularly for users who are concerned about risks. High satisfaction with DFS usage reflects positive user experiences, while barriers related to internet access, financial literacy, and knowledge gaps persist, indicating areas for potential enhancement in user education and engagement.

4.2.2. Chi – square test of independence

The results shown below are for factors that exhibited a connection with demographic variables using the Chi-square test of independence.

- **Gender and variables**

- ✓ **Gender Association with Adoption and Usage of Digital Financial Platforms.**

Revolut, PayPal, Barion ($\chi^2 = 14.747$, $df = 4$, $p = 0.005$, $V = 0.282$): A clear behavioral pattern in the adoption of digital financial tools is suggested by the moderate effect size ($V = 0.282$) and statistically significant association ($p = 0.005$). Because of their flexibility in international transactions, trading, or regular cross-border payments activities—all of which are linked to greater financial experimentation and digital curiosity—male users of these platforms may be more cautious. Female users, on the other hand, might give priority to these sites for safer, more reliable actions like peer-to-peer transfers and online purchases. This may suggest that women prioritize these services' dependability and simplicity in everyday financial tasks, whereas men usually draw attention to their wider range of financial skills.

- ✓ **Gender Association with Preferred Digital Financial Service**

Cryptocurrency Exchanges ($\chi^2 = 17.493$, $df = 4$, $p = 0.002$, $V = 0.307$): There is a greater gender disparity in the adoption of these platforms, as seen by the highly significant ($p = 0.002$) and moderate-to-strong impact size ($V = 0.307$) association between gender and cryptocurrency exchange preference. The results indicate that men's early adoption of innovative financial trends and risk-taking tendencies may be linked to bitcoin. On the other hand, female consumers might be more aware because of worries about perceived complexity, regulatory uncertainty, or market volatility. This discrepancy could be caused by avoidance of risk as well as more general structural issues including unequal access to knowledge about investments and exclusion from networks centered around fintech.

- **Age and variables**

- ✓ **Digital Financial Platforms and Age-Based Patterns**

Revolut, PayPal, and Barion ($\chi^2 = 42.188$, $df = 16$, $p < 0.001$, $V = 0.238$): The moderate association (Cramér's $V = 0.238$) suggests that age differences influence how people interact with

digital financial services. These services' streamlined interfaces, rapid transfers, and global accessibility correspond to younger customers' fast-paced banking habits. Older consumers, on the other hand, may be hesitant to adopt such platforms due to concerns about data security, difficulties navigating app-based interfaces, or distrust of non-traditional financial providers.

ICredit ($\chi^2 = 38.592$, $df = 12$, $p < 0.001$, $V = 0.263$): The insignificant effect size ($V = 0.263$) suggests that age has a considerable impact on the likelihood of adopting digital lending services. Younger people may use such platforms for convenience when they face complications to traditional loans, such as a lack of credit history or a requirement for quick approval for expenses like travel or education. In contrast, older people, who frequently have established credit and ties with banks, may prefer in-person consultations and traditional lending processes, considering them as more reliable and personable.

Wise ($df = 16$, $p = 0.002$, $V = 0.225$, $\chi^2 = 37.535$): Younger users that value low-cost cross-border transactions for international freelancing, studying abroad, or expatriate living are likely the main drivers of Wise's appeal, according to the moderate association ($V = 0.225$). Wise's reasonable costs and openness about exchange rates complement their practical approach. Older consumers, on the other hand, might be less likely to adopt fintech payment methods because they are not familiar with them or because they prefer traditional international wire transfers via banks, which they believe to be more dependable even though they are more expensive.

Western Union ($df = 8$, $p = 0.002$, $V = 0.254$, $\chi^2 = 23.96$): Age affects customers' choice of transfer services, according to the modest impact size ($V = 0.254$) and significant connection. Due to Western Union's established reputation and offline cash-based transfer options, older people may continue to choose it, especially in areas where digital capabilities are limited or unreliable. Conversely, younger users may only utilize Western Union in urgent circumstances or in the absence of any digital alternatives, which is indicative of their overall trend toward app-based financial solutions.

MyRaiffeisen ($df = 12$, $p < 0.001$, $V = 0.298$, $\chi^2 = 49.7$): Significant age-related differences in preferences for digital solutions associated with banks are indicated by this robust connection ($V = 0.298$). Older consumers, who have probably been Raiffeisen customers for a long time, appreciate utilizing a digital app supported by a company they are familiar with and trust the bank's reputation. On the other hand, younger users can view bank-affiliated apps as less creative or more

complicated than fintech alternatives, which provide a better integrated user experience along with extra features like rewards and cost tracking.

✓ **Age Association with Preferred Digital Financial Services**

Mobile banking apps (df = 16, p = 0.013, V = 0.204, $\chi^2 = 31.052$): Although people of various ages use mobile banking apps, younger users seem to be more engaged, according to the small-to-moderate impact size ($V = 0.204$). Mobile banking is a logical solution for daily transactions because of their reliance on smartphones and the tendency for digital money management. Even while mobile banking is becoming more popular, older users may still prefer desktop portals or branch visits, particularly for more complicated financial tasks like managing a mortgage or making investment decisions.

PayPal and Venmo are examples of online payment platforms ($\chi^2 = 33.513$, df = 16, p = 0.006, V = 0.212): Age affects how consumers integrate online payment services into their daily routines, according to the moderate association ($V = 0.212$). Because of their speed and integration with e-commerce platforms, these systems are widely used by younger people for informal transactions. Older users, on the other hand, might only utilize these services for certain purposes, including making purchases online from reliable sellers, because they are hesitant to link their bank accounts to third-party apps or are worried about online fraud.

Cryptocurrency Currency Exchanges (df = 16, p = 0.037, V = 0.192, $\chi^2 = 27.442$): Age-based disparities in cryptocurrency adoption are highlighted by the small-to-moderate impact size ($V = 0.192$). Younger users, who are frequently more at ease with digital investing, see cryptocurrencies to conduct decentralized transactions and as a chance for large rewards. The impact of media trends and online financial communities also feeds their curiosity. Older users, on the other hand, are more likely to favor conventional, lower-risk assets and are often hesitant when dealing with cryptocurrencies due to their price fluctuation and lack of regulatory assurances.

✓ **Age Association with Barriers to Usage**

Limited Internet Access (df = 20, p = 0.044, V = 0.207, $\chi^2 = 31.917$): Adoption of online financial services is more difficult for older people, especially those living in rural areas or places with poor digital infrastructure, according to the moderate association ($V = 0.207$). These restrictions could be caused by poorer digital knowledge, restricted access to smart devices, and poorer internet

connectivity. Because they were exposed to technology earlier and have more money to spend on smartphones and internet services, younger people are typically less impacted.

✓ **Age Association with Integration with Other Services**

Third-Party Platform Integration ($\chi^2 = 40.609$, $df = 20$, $p = 0.004$, $V = 0.234$): Expectations for service integration vary with generation, as indicated by the moderate impact size ($V = 0.234$). Younger consumers may choose financial services that easily link with online markets, loyalty programs, and budgeting apps because they are used to multi-platform ecosystems. Their user experience is improved, and money administration is made simpler by this integration. In contrast, older users may favor standalone, streamlined services that do not require associated third-party applications, which reflects their preference for privacy and ease of use.

• **Place of Residence and variables**

✓ **Place of Residence Association with Adoption and Usage of Banking and Financial Services**

ICredit ($df = 12$, $p = 0.014$, $V = 0.212$, $\chi^2 = 25.186$): The adoption of Icredit's digital lending services appears to be influenced by geographic location, as indicated by the significant association ($p = 0.014$) and moderate effect size (Cramér's $V = 0.212$). Because there are fewer infrastructure restrictions and more exposure to digital credit options, urban customers are more inclined to use Icredit. The platform's quick online approval process appeals to users who are used to digital ease and fits in with their financial habits. This disparity may be worsened in these regions by the tendency for standard lending sources.

KH (Bank) ($\chi^2 = 27.152$, $df = 16$, $p = 0.04$, $V = 0.191$): KH's use of digital banking varies by region, according to the statistically significant result ($p = 0.04$) and small-to-moderate effect size (Cramér's $V = 0.191$). In cities where branch visits may not be feasible, the provision of digital channels enhances users' lifestyles. Rural users, on the other hand, might adopt technology more slowly because they are less exposed to it and are more likely to rely on in-branch interactions, where trust is built through direct conversation. Differences in adoption may also be explained by the existence or lack of local banking outreach programs.

CIB (Bank) ($\chi^2 = 29.103$, $df = 16$, $p = 0.023$, $V = 0.198$): Geographical differences in platform involvement are shown in the moderate effect size (Cramér's $V = 0.198$) and significant ($p = 0.023$) relationship between place of residence and CIB service utilization. Urban customers' increased comfort level with online financial instruments and their ability to shift between digital and physical banking with ease are probably the main reasons for their use of CIB's digital platform. Marketing efforts and better branch-to-digital service integration may also be advantageous to residents of cities. On the other hand, because of inadequate infrastructure and a desire to link banking with in-person branch visits rather than online interactions, rural customers might not be as engaged, which would support traditional banking practices.

5. DISCUSSION

5.1. A deeper insight into the interview results

Through in-depth interviews with bank managers, several important themes were identified concerning the integration and adoption of digital financial services within the banking sector. While the managers offered diverse perspectives, they consistently emphasized the growing trend of digitalization, the obstacles encountered by consumers in embracing digital services, and the crucial role of digital innovation in ensuring the banks' competitive advantage.

- **Key Themes:**

Digital Service Adoption: A common thread across interviews is the role of digital financial services in reducing the need for in-branch visits and paper-based processes. From opening bank accounts to managing transactions, managers emphasize how consumer convenience has been significantly enhanced by the digitization of services.

Barriers to Adoption: One of the recurring barriers discussed is the digital literacy gap, particularly among older customers. While younger users tend to adapt quickly, older generations often struggle with technology, requiring additional support and education.

Corporate vs. Consumer Services: There is a clear distinction between services offered to consumers and those available to corporate clients. Consumer-focused digital services are more mature, with mobile apps and online banking widely adopted. In contrast, corporate services are somewhat more manual, particularly in areas like loan management.

Strategies for Engagement: All banks interviewed employ a combination of customer education, enhanced user experience (UX), and digital innovations like mobile-first strategies to increase engagement. Managers also emphasize the importance of keeping up with competitors, particularly fintech companies like Revolut, to ensure their digital services remain attractive.

- **Detailed Breakdown of Interview Insights:**

Bank 1

Role: The head of the local unit. Uses all digital services personally to ensure alignment with customer expectations.

Consumer Services: The bank offers internet banking, mobile apps, and digital card payments (Google Pay, Wallet, Apple Pay). Account openings and smaller loans can be processed digitally.

Corporate Services: Corporate clients use internet banking for transfers, deposits, and statements, but larger loans require in-person processes.

Adoption Factors: The convenience, speed, and financial benefits of digital services attract users. Mobile apps have seen high adoption rates, with significant reductions in paper-based transactions.

Barriers: Bureaucratic hurdles and a government policy favoring cash usage remain significant barriers.

Engagement Strategy: The bank aims to become fully paperless and promote digital accounts and lending through mobile apps.

Bank 2

Role: Sales and branch manager responsible for digital sales, with deep involvement in both consumer and corporate digital initiatives.

Consumer Services: Account opening (with NFC ID requirements), virtual savings tools, and loans can be processed via the app. The "mobile-first" strategy is central to the bank's approach.

Corporate Services: Although digital, corporate services such as account opening via video banking are more complex and still require some manual processes.

Adoption Factors: Younger customers gravitate toward digital services due to their speed and convenience, while older customers may struggle with the necessary digital skills.

Barriers: Digital literacy and access to modern devices are primary obstacles, especially among older clients.

Engagement Strategy: The bank educates clients in branches and highlights digital innovations like the QR code payment method.

Bank 3

Role: A branch office that does not specialize in digital services but still encourages online transactions.

Consumer Services: Mobile banking for transactions, insurance, and personal loans.

Corporate Services: Fewer digital services are available, with companies still requiring personal meetings for complex tasks.

Adoption Factors: Customers who adopt digital services tend to appreciate the convenience and continue using them.

Barriers: Digital challenges persist for older clients and those without smartphones.

Engagement Strategy: The introduction of digital assistants and an emphasis on promoting digital products through apps and online advertising.

Bank 4

Role: The manager is involved in educating clients on digital services and ensuring that the shift to digital channels is smooth.

Consumer Services: The bank offers a wide range of digital services including online account opening, payments, and utility transfers via the mobile app.

Corporate Services: The bank has digitized corporate lending and transactions, although some loans still require in-person meetings for risk assessment.

Adoption Factors: Clients appreciate the time savings, ease of use, and transparency of digital services. However, education and guidance are necessary to mitigate fears of the digital culture.

Barriers: Older clients face technology and knowledge gaps, while younger clients experience no barriers.

Engagement Strategy: Continuous system improvements, user-friendly interfaces, and promotional campaigns are employed to foster customer loyalty.

Conclusion:

These interviews collectively illustrate the critical role that education, technology access, and continuous innovation play in fostering the adoption of digital banking services. As banks continue to digitize, they must remain mindful of the varying levels of digital literacy among their customers, particularly older generations, and work to bridge these gaps with training and support. Moreover, as fintech competitors push the boundaries of what's possible in digital banking, traditional banks must keep pace by streamlining processes and enhancing the user experience.

5.2. In-depth interview discussions

The findings from the interviews with bank managers offer valuable insights into the adoption and integration of digital financial services. This section will interpret these findings in relation to the research questions posed, compare them with existing literature, and discuss any contradictions or novel insights that emerged.

Consumer Adoption of Digital Financial Services

The interviews revealed that the adoption of digital financial services is highly prevalent among younger consumers, who are more comfortable with technology. This aligns with (Szemán et al., 2022), who found that digital literacy and familiarity with mobile devices are key drivers of digital banking adoption in Hungary. The managers emphasized the convenience, speed, and cost-saving benefits of digital banking as significant motivators for consumers, which is consistent with the Technology Acceptance Model (TAM). According to TAM, perceived ease of use and perceived usefulness are critical factors influencing the adoption of new technologies (Davis, 1989).

Barriers to Digital Adoption

Overall, the key barriers to digital adoption identified by interviewees include a **digital literacy gap**, particularly among older clients, and **limited access to technology** for those lacking modern

devices or stable internet. Many clients still prefer **in-person interactions** due to discomfort with digital platforms, compounded by **bureaucratic and policy constraints** favoring cash transactions in some areas. For corporate clients, the **complexity of services** such as loans requires personalized support, hindering full digitalization. Additionally, **trust and security concerns** about online transactions slow adoption, alongside a general **resistance to change** among less tech-savvy clients.

Thus, despite positive trends, the interviewees highlighted barriers to digital adoption, especially for older clients, who face challenges with digital literacy and device access. (Koskelainen et al., 2023) similarly stress the importance of financial literacy in the digital age, particularly among older users. The need for banks to offer accessible digital literacy initiatives is critical, given the findings by (Neves et al., 2023b), which indicate that ease of access and perceived security are essential for encouraging digital adoption among less digitally literate demographics.

Interestingly, while most of the literature focuses on older consumers, my findings reveal that even younger consumers face occasional barriers, particularly when internet connectivity or device access is limited. This finding provides a nuanced view, suggesting that while digital literacy is often age-related, structural issues such as access to high-quality digital infrastructure can affect all age groups.

Corporate vs. Retail Digital Services

Another key finding from the interviews is the disparity between the digital services available to retail versus corporate clients. Retail banking services, particularly those related to basic transactions such as payments, transfers, and account management, are almost entirely digitized. In contrast, corporate banking services, especially loans, still require a considerable degree of in-person interaction. This distinction supports (Broby, 2021)'s view that, despite digital progress, trust and personalized service are still essential in corporate banking, where clients need customized solutions that digital platforms can't yet fully replace. Complex financial services often need direct interaction, making full digitization challenging. However, managers in this study noted ongoing efforts to digitize even these areas, highlighting the steady digital transformation in corporate banking.

Popular Digital Services

Interview insights revealed that the most popular digital services among retail customers are mobile applications for balance checks, fund transfers, and bill payments, which managers noted are integral to client engagement strategies. According to Bashir and (Bashir & Madhavaiah, 2015), convenience and usability are strong determinants of customer satisfaction in internet banking, and mobile applications cater directly to these needs by offering ease of use and time-saving benefits.

Strategies for Enhancing Digital Engagement

To overcome adoption barriers and boost engagement, banks are implementing strategies like in-branch app demonstrations, customer education sessions, and a focus on mobile-first design. (Thottoli et al., 2022) highlight that digital transformation in banking must incorporate customer feedback to enhance the user experience and stay competitive in the digital age. Additionally, (Naimi-Sadigh et al., 2022) emphasize that a digital-first approach from start to finish is essential for a seamless customer journey, an aim that bank managers in the interviews align with through planned innovations like AI-powered digital assistants.

Broader Implications for Banking

These findings underscore the importance of adaptive strategies to maintain competitiveness against fintech companies and evolving customer expectations. As (Gomber et al., 2017) note, the need for customized, flexible, and efficient products is driving digital transformation across the financial sector. By continuously refining digital services and addressing literacy gaps, banks can build trust and broaden digital adoption across diverse demographic groups, thus strengthening customer loyalty and enhancing long-term engagement.

5.3. A deeper insight into the questionnaire results

- **Adoption and Usage**

High Adoption: “Revolut, PayPal, Barion” and other Digital Financial utilities show strong daily usage, capturing a relevant number of consumers. This reflects their dominance in user engagement, likely due to a mix of accessibility, ease of use, and their flexibility to keep up with the market trends.

Low Adoption: In contrast, services like iCredit, Wise, and Western Union as an example have limited daily engagement, respondents rarely or never use them. This may be attributed to a more specialized user base that they target or less relevance to the daily financial needs of the general population. I assume that the popularity of these digital platforms is not as apparent as PayPal's or Revolut's, because they all have similar services but the difference is the marketing strategies they follow to target as more consumers as they can.

Moderate Adoption: Platforms like K&H Mobilbank and Erste MobileBank show engagement challenges. This may point to limited appeal or competition from more versatile or well-integrated platforms.

- **Perceived Benefits**

Top Benefits: Convenience and Ease of Access are the top perceived benefits, underscoring user preference for services that provide easy, quick access to financial functions.

Secondary Factors: Faster transaction times and lower costs are less influential, suggesting that users are less aware of costs and speed benefits. However, these two can be very influential in the case of international money transfer. The fact that most respondents are young Hungarians is playing a major role when it comes to these benefits otherwise there is a huge probability that cost, and speed will be the top benefits.

Minimal Impact: Enhanced security features and access to additional financial tools are not major influences. This suggests that security is an expectation rather than a differentiating feature, and additional tools may not yet resonate with everyday needs.

- **Security Concerns**

Mixed Levels of Concern: While "Somewhat Concerned" and "Very Concerned" about security, represent a notable portion of respondents, "Not Very Concerned," and "Not Concerned at All" are not. This variation indicates awareness of security but reflects a generally moderate concern, perhaps due to growing trust in digital service providers.

Minimal Uncertainty: Only 1 respondent expressed uncertainty, implying that most users are at least familiar with security considerations, whether they are highly concerned.

- **User Experience and Satisfaction**

High Satisfaction: A strong majority are satisfied with their digital financial service experience, indicating that these services meet user expectations effectively.

Neutral and Negative Feedback: With only 17% neutral and a minimal 1% dissatisfied, dissatisfaction appears rare, highlighting that digital financial services generally provide a positive user experience.

- **Preferred Digital Financial Service**

Mobile Banking Dominance: With 40.1% daily and 41.5% weekly users, mobile banking apps are essential for financial management, reflecting their central role in users' financial routines.

Selective Use of Digital Wallets: Digital wallets have strong daily engagement but also there is a segment that never uses them, showing that while popular, they appeal to specific user groups.

Varied Online Payment Platform Use: Online payment platforms have diverse usage, but also a significant portion never engaging, which suggests a mix of use cases and preferences.

Low Cryptocurrency Exchange Use: With 85% never engaging, cryptocurrency exchanges appear niche, aligning with limited appeal or knowledge within the general user base.

- **Barriers to Use**

Access and Knowledge Gaps: Limited internet access and lack of knowledge are primary barriers, pointing to technical and educational limitations among some users.

Uncertainty: The largest group selected "I don't know", showing significant uncertainty or disengagement, perhaps from users who are unfamiliar or have no specific opinion on barriers.

Complexity and Traditional Preferences: Complexity of use and a preference for traditional banking suggest that simplicity and familiarity remain influential, with some users hesitant to switch from familiar, traditional options.

- **Impact of Promotions**

Positive Influence: Promotions have a substantial impact, with 35% "likely" and 13% "very likely" to be influenced by them, indicating that incentives effectively encourage usage.

Neutral and Unaffected: A balanced portion remains neutral (30%) or is unlikely to be swayed, suggesting that promotions have mixed efficacy across different user segments.

- **Customer Support Experience**

Positive Experience: Most users rated customer support positively, as "Good" and as "Excellent." This reflects a strong customer support experience, which likely contributes to user satisfaction.

Moderate Satisfaction: With 27% rating it as "Average" there's room for improvement in meeting all user expectations.

Low Dissatisfaction: Only 4% reported a poor experience, indicating that negative support experiences are minimal.

- **Integration with Other Services**

High Importance: A large portion of users values integration with other services, highlighting the importance of seamless interoperability in digital financial tools.

Mixed Neutrality and Low Importance: A percentage of 28% neutral and 2% low/not important, shows that while most users value integration, some are indifferent or unaffected by this feature.

- **Digital Financial Literacy**

Moderate Literacy: With being somewhat or very informed, there is a reasonable level of digital financial literacy among users, although there remains room for growth.

Need for Improvement: A notable display of low or neutral awareness, which suggests that educational initiatives could benefit users and increase confidence in these platforms.

- **Gender**

Slight Female Majority: With gender, there is a balanced but female-leaning user base, indicating strong engagement across genders but slightly higher adoption or interest from female users.

- **Age**

Youth Dominance: A significant population are aged 18-25, with a secondary concentration in the 26-35 range. This youthful demographic indicates that younger users are the primary adopters of digital financial services, likely due to comfort with technology.

Lower Engagement among Older Users: Smaller representation among older age groups (36-45 and above) suggests that digital financial services appeal more to younger demographics, who may find digital platforms more convenient or accessible.

- **Place of Residence**

Rural and Small-Town Majority: With residents from small towns and from villages, most users reside outside large urban areas, showing that digital financial services appeal to rural and small-town users.

Limited Urban Presence: Only few reside in the capital, highlighting the potential for growth in urban and capital markets where adoption may still lag.

5.4. Questionnaire discussion

Adoption and Usage

A comparative study on consumer preferences in digital payments for Hungary highlights that platforms with user-centric, accessible designs, like Google Pay, dominate usage, whereas others with limited user-friendly interfaces or complex processes face lower adoption (CHAK, 2024). This mirrors this research's finding that OTP SmartBank and Google Pay have high daily usage, emphasizing the Technology Acceptance Model (TAM) (Marikyan & Papagiannidis, 2023) which postulates that perceived ease of use significantly influences adoption rates.

Perceived Benefits

The results of this questionnaire align well with Rogers' (2003) Diffusion of Innovations (DOI) theory (García-Avilés, 2020), which suggests that innovations perceived as beneficial, simple to use, and compatible with users' existing needs tend to be adopted more readily. In this study, "Convenience of Use" and "Ease of Access" were identified as the top perceived benefits of digital financial services, illustrating a strong preference for accessible and straightforward solutions. This preference reflects DOI's emphasis on the importance of relative advantage and simplicity, where ease of use and alignment with daily needs drive adoption. Additionally, while "Faster Transaction Times" and "Lower Transaction Costs" add value, they are viewed as secondary factors, consistent with DOI's observation that users often prioritize compatibility over secondary attributes. Similar trends are seen in Hungary; Horváth and Mészáros (2021) noted that Hungarian users similarly

favor digital financial services for their accessibility and ease, with factors like transaction speed and cost taking a back seat. These insights underscore a broader, regional alignment, where the simplicity and practical benefits of digital finance tools take precedence over advanced features, supporting both global and regional findings.

Security

studies on Hungarian digital finance. For instance, (Müller & Kerényi, 2021) highlight a trend of cautious optimism, where significant portions of Hungarian digital finance users express concerns over data vulnerability but still trust well-established financial institutions that emphasize transparency and robust security measures. This behavior corresponds to the Protection Motivation Theory (Shillair, 2020), which suggests that individuals assess perceived threats and evaluate coping mechanisms before deciding to engage with digital services. This theory implies that for users with higher levels of concern, visible and proactive security measures can enhance confidence, while maintaining transparency can reinforce trust among less concerned users. Therefore, financial service providers in Hungary could benefit from increasing transparency about their security protocols to mitigate anxieties and foster broader adoption of digital services.

User Satisfaction and Experience

High satisfaction levels with digital financial services in Hungary are often attributed to intuitive design and responsive support (Becsei et al., 2023). The satisfaction rates reported in the survey, with 85% positive feedback, suggest that usability and customer support are crucial for retaining user engagement. This aligns with the Service Quality Model (SERVQUAL) (Munthiu et al., 2014), which emphasizes reliability and responsiveness as key factors in user satisfaction.

Preferred Digital Financial Service

There is a strong reliance on mobile banking apps, along with selective usage of digital wallets. Literature suggests that mobile apps provide a comprehensive interface tailored to financial management, explaining their high daily usage (CHAK, 2024). The limited appeal of cryptocurrency, as seen in the survey, reflects global trends, particularly among conservative demographics, with low daily engagement observed in similar studies.

Barriers to Use

The key findings from this research highlight substantial barriers to digital financial service adoption, resonating with theories that emphasize access, literacy, and trust as pivotal factors in financial inclusion. Limited internet access and lack of knowledge reflect challenges outlined by the Digital Divide Theory, where structural disparities in digital resources and competencies limit equitable technology use (van Dijk, 2006). Additionally, the high rate of respondents indicating “I don’t know” suggests a level of uncertainty or disengagement, indicative of low digital literacy and awareness, which are critical for fostering digital readiness and trust in new financial technologies (Helsper & Reisdorf, 2017) (Helsper, 2011). Complexity of use and a preference for traditional banking further reinforce findings from behavioral finance studies, which reveal that familiarity and simplicity often drive financial behavior, with consumers more inclined toward familiar, traditional banking channels (Grohmann & Menkhoff, 2015).

Impact of promotions

Digital financial adoption is positively influenced by promotional incentives, though with varied impact levels (Becsei et al., 2023). Survey results indicate that promotions sway around 35% of users, underscoring their potential as a strategic tool for adoption but also suggesting a saturation point beyond which additional promotions may have diminishing returns.

Customer support experience

The study finds that customer support experiences are generally positive, with a sum of respondents rating them as “Good” and as “Excellent”. This aligns with literature emphasizing the importance of customer support in fostering user trust and loyalty. Research by (Kesharwani & Bisht, 2012) underscores that accessible, effective customer support can mitigate uncertainties, particularly in financial services where users need assurance on security and problem resolution. For Hungarian DFS providers, maintaining high support standards could serve as a competitive advantage, ensuring continued satisfaction and mitigating concerns about security or usability issues.

Integration with other services

The high value placed on integration with other services, rating it as essential, aligns with the concept of value co-creation in digital service ecosystems, where customer engagement is enhanced through seamless interactions across platforms (Teixeira et al., 2012). Studies on omnichannel integration emphasize that the quality of integration, especially in service environments, directly impacts perceived customer experience and satisfaction (W. Gao et al., 2021).

Digital financial literacy

The moderate level of digital financial literacy, with only 18% being "very informed," highlights a need for programs that can progressively improve user confidence and knowledge in digital financial services. Research shows that financial education initiatives targeting digital literacy, such as those by Rahardjo (2023) and Khalid et al. (2023), effectively boost users' self-efficacy in online transactions, contributing to a more informed user base. Rahardjo (2023) argues that educational interventions not only enhance digital financial awareness but also reduce uncertainty and cyber-related apprehensions, essential for broader adoption. Khalid et al. (2023) add that ongoing support and education build confidence, encouraging users to interact with digital financial platforms more comfortably. (Khalid & Maqsood Ali, 2024) (Rahardjo, 2023)

Gender Distribution

The 57% female representation among respondents suggests a gendered engagement trend in digital financial services, where relational and supportive interactions are often prioritized. Research indicates that women place higher value on service reliability and customer support in digital environments, particularly in sensitive sectors like finance (Tripathi & Rajeev, 2023). This finding aligns with the importance of trust-building features in digital platforms to foster greater comfort and satisfaction among female users, who may perceive relational support as critical to their digital financial experiences.

The 42% male representation among respondents reflects distinct engagement patterns in digital financial services. Research indicates that male users may prioritize functionality, efficiency, and innovation over relational support, often focusing on transaction speed and platform performance (Goh & Sun, 2014). This aligns with a task-oriented approach, where male users value direct access

to tools and streamlined processes that facilitate quick decision-making. In this context, digital financial services that emphasize robust technology, self-service options, and minimal assistance may be particularly effective in enhancing satisfaction and retention for male users.

Age Distribution

The high concentration of users in the 18-25 age bracket reflects younger generations' natural inclination toward digital services. Research suggests that younger users are typically more receptive to digital innovation and eager to adopt new technologies (Anderson & Bolton, 2015). This trend highlights the importance of crafting digital content and features that are tailored to younger users' preferences, thereby boosting engagement and fostering sustained use. By developing age-appropriate and relatable digital experiences, service providers can make digital platforms more attractive and accessible to this demographic (Gonçalves et al., 2020).

For mature users, distinct engagement strategies in digital financial services are essential to meet their unique needs. These users often prioritize usability, security, and accessible support over innovative features. Research by Farag and Narra (2024) (Farag et al., 2024) suggests that barriers to adoption for mature users include challenges in digital literacy and limited comfort with new technologies. To address these, digital services should focus on clear, user-friendly interfaces, robust security measures, and accessible support options. Such strategies can foster trust and ease, encouraging mature users to adopt and engage more confidently with digital financial platforms.

Place of Residence

The distribution we got from this research reflects a primarily small-town and rural demographic. This trend aligns with Szobonya (2021), who highlights that rural and small-town populations in Hungary increasingly regard digital financial services as essential due to limited access to physical bank branches (Szobonya, 2021). This perspective supports the Financial Inclusion Theory, which emphasizes digital solutions as critical in underserved areas to bridge access gaps. Additionally, the Technology Acceptance Model (TAM) underscores that convenience and ease of access are vital for technology adoption factors that small-town users particularly value, as they rely on accessible digital platforms over sporadic branch visits (Csiszarik-kocsir & Lentner, 2023). Moreover, the urban-rural digital divide noted by (Feurich et al., 2024) suggests that rural

populations often face infrastructural and literacy barriers in digital finance adoption, underscoring a need for targeted support to address this gap.

6. CONCLUSION

This research highlights the complex landscape of digital financial services (DFS) adoption in Hungary, underscoring the interplay between convenience, digital literacy, and security concerns as key factors driving or inhibiting engagement. The findings reveal a demographic divide: while younger consumers embrace DFS for its convenience and ease of access, older populations face challenges due to limited digital literacy and device accessibility. This disparity emphasizes the need for targeted educational initiatives aimed at bridging digital skills gaps to ensure broader financial inclusion.

Security perceptions emerged as a critical factor influencing DFS adoption, with a notable segment of users expressing concerns over data privacy and transaction security. This concern transcends demographic boundaries, indicating that trust in digital platforms is paramount for sustainable adoption across all age groups. Financial institutions are thus encouraged to prioritize transparent and robust security protocols to foster trust, especially among digitally hesitant users.

Furthermore, this study reveals that mobile applications and digital wallets are the most widely adopted DFS platforms, reflecting consumer preference for tools that integrate seamlessly into daily financial activities. Conversely, services requiring high digital literacy or specialized usage, such as cryptocurrency exchanges, show limited adoption, suggesting an opportunity for targeted awareness and support to broaden their user base.

In-depth interviews with bank managers revealed important information into DFS adoption and problems in Hungary. Managers underlined that younger users have higher adoption rates due to convenience, whereas elderly consumers face challenges such as digital literacy gaps and a preference for in-person connection. Corporate clients rely heavily on digital services for basic transactions but prefer in-person interactions for more sophisticated operations such as loans. Mobile apps for balance checking, transfers, and bill payments are popular. Banks offer in-branch app demonstrations and client education to increase engagement, with ambitions to deploy AI-powered digital assistants to help customers even more. These findings emphasize the necessity of overcoming both technological and user-related hurdles to DFS adoption.

The study also points out the importance of demographic variables like gender, age, and area of residence have a big impact on how digital financial services are adopted and used. Women place a higher value on financial tools that provide simplicity and security, whereas males are typically more drawn to speculative platforms like cryptocurrency exchanges. Age-based trends show that although older users rely on traditional, bank-affiliated platforms because of familiarity and trust, younger people prefer mobile-first, fintech alternatives. Residence location is also crucial: whereas people in the countryside encounter obstacles like inadequate infrastructure and gaps in digital literacy, urban users enjoy the advantages of increased digital accessibility and are more likely to interact with online financial platforms. These findings highlight the necessity of inclusive financial service designs that take demographic differences in digital access into account.

In addition to addressing current barriers, financial institutions should consider promoting DFS through user-centered design, enhanced support for digital literacy, and transparent promotional strategies. These initiatives not only facilitate adoption but also contribute to a more inclusive digital economy. Overall, this research provides critical insights into DFS adoption, highlighting actionable areas where financial institutions and policymakers can enhance accessibility, trust, and inclusivity within Hungary's digital finance landscape.

7. LIMITATIONS AND FUTURE RESEARCH

This study faced certain limitations. First, the sample size, though representative, may not capture the full diversity of DFS users, particularly those in highly rural or marginalized communities where digital access is limited. Additionally, the study's reliance on self-reported data in the surveys introduces potential biases, as respondents may have overstated or understated their DFS usage and satisfaction. The scope was also limited to Hungary, so findings may not fully apply to other countries with different digital infrastructures or cultural attitudes toward digital finance.

Future research should explore larger, more diverse samples across multiple countries to allow for cross-cultural comparisons and broader insights into DFS adoption. Longitudinal studies could provide a deeper understanding of how digital literacy and DFS preferences evolve over time, especially among older populations. Additionally, research into the specific types of educational programs and digital tools that most effectively bridge digital literacy gaps would be beneficial. As digital finance continues to integrate with emerging technologies like artificial intelligence and

blockchain, future studies should also examine the implications of these innovations for user trust and accessibility in the digital financial landscape. Furthermore, other social aspects such as culture should be investigated.

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In-depth Interview questions

Introduction

Dear Participant,

My name is Halima Kaa, and I am a bachelor student at the University of Sopron, majoring in International Business Economics at Alexandre Lamfalussy Faculty of Economics. I am conducting this research as part of my thesis on "Digital Financial Services and Consumer Behavior."

I would like to invite you to participate in an in-depth interview to discuss your experiences and opinions on digital financial services. Your participation is entirely voluntary, and the information you provide will remain anonymous and confidential. The data collected will be used solely for research purposes and will not be shared with third parties.

I handle your data and responses discreetly, using the information exclusively for research purposes. Your insights will greatly contribute to the success of my research.

Thank you for considering this request. I look forward to your participation.

Sincerely,

Halima

Kaa

University of Sopron

General:

- Could you describe your role at the bank and its connection to digital financial services?
- What digital financial services does your bank presently provide to consumers?
- What digital financial services does your company currently offer to customers?

Specific:

- What factors drive consumer adoption of your bank's digital financial services?

'By this question I want to know what's the driving factors from the view of a bank, which ones of the independent variables "Perceived Benefits, Security, ease of access, User Experience,

Barriers to Use, Impact of Promotions, Integration, Knowledge” is the catalyst to adopt DFS of the bank’

- How often do consumers use your digital financial services, and which specific services are most popular?
- What features or aspects of digital financial services do consumers find most appealing?
By adoption I mean usage
- What are the primary barriers to consumer adoption of digital financial services?
- What strategies are used to increase consumer engagement with digital channels?

Personal:

- What strategies are used to increase consumer engagement with digital channels?

Open answer is welcomed

Hungarian Version :

A mélyinterjú kérdései:

Bevezetés

Kedves Résztvevő!

Halima Kaa vagyok, a Soproni Egyetem alapképzési hallgatója vagyok, a Lámfalussy Alexandre Közgazdaságtudományi Kar Nemzetközi Vállalkozásgazdaságtan szakán. Ezt a kutatást a „Digitális pénzügyi szolgáltatások és fogyasztói magatartás” című szakdolgozatom részeként végzem.

Meghívom Önt, hogy vegyen részt egy mélyinterjún, hogy megvitassa tapasztalatait és véleményét a digitális pénzügyi szolgáltatásokkal kapcsolatban. Az Ön részvétele teljesen önkéntes, és az Ön által megadott információk névtelenek és bizalmasak maradnak. Az összegyűjtött adatokat kizárólag kutatási célokra használjuk fel, harmadik féllel nem adjuk ki.

Adatait és válaszait diszkréten kezelem, az információkat kizárólag kutatási célokra használom fel. Meglátásai nagyban hozzájárulnak kutatásom sikeréhez.

Köszönjük, hogy figyelembe vette ezt a kérést. Várom részvételét.

Tisztelettel,

Halima Kaa

Soproni Egyetem

Általános:

- Le tudná írni a banknál betöltött szerepét és kapcsolatát a digitális pénzügyi szolgáltatásokkal?
- Milyen digitális pénzügyi szolgáltatásokat nyújt jelenleg a bankja a fogyasztóknak?
- Milyen digitális pénzügyi szolgáltatásokat kínál jelenleg az Ön cége ügyfeleinek?

Specifikus:

- Milyen tényezők vezetnek ahhoz, hogy a fogyasztók elfogadják bankja digitális pénzügyi szolgáltatásait?

„Ezzel a kérdéssel azt szeretném megtudni, hogy egy bank szemszögéből melyek a hajtóerőtényezők, a „Érzékelt előnyök, Biztonság, könnyű hozzáférés, felhasználói élmény, használat akadályai, promóciók hatása, integráció, tudás” független változók közül melyik. "a katalizátor a bank DFS-ének elfogadásához"

- Milyen gyakran veszik igénybe a fogyasztók az Ön digitális pénzügyi szolgáltatásait, és mely szolgáltatások a legnépszerűbbek?
- A digitális pénzügyi szolgáltatások mely jellemzőit vagy szempontjait tartják a fogyasztók leginkább vonzóknak? Az örökbefogadás alatt a használatot értem
- Melyek az elsődleges akadályok a digitális pénzügyi szolgáltatások fogyasztói átvétele előtt?
- Milyen stratégiákat alkalmaznak a fogyasztók digitális csatornák iránti elkötelezettségének növelésére?

Személyes:

- Milyen stratégiákat alkalmaznak a fogyasztók digitális csatornák iránti elkötelezettségének növelésére?

Nyílt választ szívesen fogadunk

Questionnaire

1. Adoption and Usage: How frequently do you use digital financial services (e.g., mobile banking apps, online payment platforms) for your financial transactions?

Reference: (Aziz et al., n.d.)

2. Perceived Benefits: What do you consider the most significant benefit of using digital financial services?

Reference: (Aziz et al., n.d.)

3. Trust and Security: How concerned are you about the security of your personal and financial information when using digital financial services?

Reference: (Chawla & Joshi, 2019), (Stewart & Jürjens, 2018)

4. User Experience and Satisfaction: How satisfied are you with the overall user experience of the digital financial services you use?

Reference: (Mahajan, 2023)

5. Preferred Digital Financial Service: Which digital financial service do you use most frequently?

Reference: (Chauhan et al., 2022b)

6. Barriers to Use: What is the biggest barrier preventing you from using digital financial services more frequently?

Reference: (Bouteraa et al., 2023)

7. Impact of Promotions: How likely are you to use a new digital financial service if it offers promotions or incentives (e.g., cashback, discounts)?

Reference: (Alhajjaj & Ahmad, 2022)

8. Customer Support Experience: How would you rate the customer support provided by your digital financial service provider?

Reference: (Bakr et al., 2023)

9. Integration with Other Services: How important is it for you that digital financial services integrate with other financial tools or platforms you use (e.g., budgeting apps, investment platforms)?

Reference: (Javkhedka et al., 2024)

10. Awareness and Education: Do you feel adequately informed about the features and benefits of the digital financial services available to you?

Reference: (Enongene et al., 2024)

11. Gender:

Reference: (Biscaye et al., 2017)

12. Age: *Generations

Reference: (S & Vidya, 2023)

13. Place of residence:

Reference: (Chamboko, 2024)