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Impact of Digital Financial Literacy on Behavioral Intention of Adopting Digital Financial Services in Rural Sindh

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ABSTRACT

Current study aimed to assess the impact of digital financial literacy on behavioral intention of adopting digital financial services in rural Sindh. This study used digital financial literacy, access to digital infrastructure, and perceived utility and ease of use as independent variables. Behavioral intention to use digital financial services was considered as the dependent variable. Residents in rural areas of Sindh were the study's targeted audience for exploring the connections between the aforementioned variables. Present research has utilized quantitative research design based on primary data, as a questionnaire was distributed to 250 participants (residents in rural areas of Sindh) during survey to collect data and establish the relationship between the research variables. Data collected from respondents was analyzed using SPSS software with the help of statistical tests (correlation and regression analysis). Findings of correlation and regression analysis have proved the positive impact of digital financial literacy, access to digital infrastructure, and perceived utility and ease of use on behavioral intention to use digital financial services in rural areas of Sindh. Hence, findings have proved that increase in digital financial literacy, access to digital infrastructure, and perceived utility and ease of use brings a definite increase in behavioral intention to use digital financial services in rural areas of Sindh.

Keywords: Financial Literacy, Digital Financial Literacy, Access to Digital Infrastructure, Perceived Utility, Ease of Use, Digital Financial Services, Behavioral Intention to Use Digital Financial Services, etc.

Table of Contents

Chapter 1

INTRODUCTION

1.1 Background of the Study

The rapid advancement of digital technology has revolutionized various aspects of daily life, including the way financial transactions are conducted. In recent years, the proliferation of digital financial services has been particularly significant, offering convenience, accessibility, and efficiency to users worldwide (Liu et al., 2021). However, while urban areas have swiftly embraced these innovations, rural regions, especially in countries like Pakistan, have lagged in adopting digital financial services. This lag can be attributed to various factors such as limited infrastructure, low literacy rates, and cultural barriers. Consequently, there arises a critical need to understand the dynamics of digital financial inclusion in rural areas and the role of digital financial literacy in shaping individuals' behavioral intentions towards utilizing such services (Azeez & Akhtar, 2021).

Despite the nation's rapid urbanization, the majority of Pakistan's population still lives in rural areas with little access to traditional financial services. The advent of digital financial services holds immense potential in bridging this gap by offering rural communities access to a wide range of financial products and services. However, the level of knowledge among rural inhabitants regarding digital money will determine the effectiveness of these projects (Tariq et al., 2021). Digital financial literacy encompasses not only the basic understanding of digital financial tools but also the ability to navigate digital platforms securely and confidently. In rural Sindh, where there is a lower literacy rate and less developed technological infrastructure, increasing digital financial literacy is essential to promoting the adoption of digital financial services (Kumari & Devi, 2022).

The concept of behavioral intention, drawn from theories such as the Theory of Planned Behavior (TPB) and the Technology Acceptance Model (TAM), provides a theoretical framework for understanding individuals' willingness to engage in specific behaviors, such as adopting digital financial services (Jariyapan et al., 2022). In the context of rural Sindh, where cultural norms and socioeconomic factors play a significant role in shaping behaviors, examining the factors

influencing behavioral intentions towards digital financial services becomes imperative. By elucidating the underlying determinants of behavioral intentions, policymakers, financial institutions, and development organizations can design targeted interventions to promote digital financial inclusion in rural Sindh effectively (Khan et al., 2019).

Access to digital infrastructure is not merely a convenience but a fundamental determinant of digital financial inclusion in rural Sindh. The challenges posed by limited internet connectivity, inadequate mobile network coverage, and the absence of affordable smartphones significantly impede the useage of online financial services in remote areas. Overcoming these infrastructural barriers demands a collaborative approach from both public and private sectors. Investments in expanding telecommunications infrastructure are essential to extend the reach of digital services to remote regions (Hasan et al., 2023). Simultaneously, promoting digital literacy programs becomes imperative to equip rural inhabitants with the skills necessary to navigate digital platforms securely and confidently. Furthermore, the perceived utility and ease of use of digital financial services play pivotal roles in shaping individuals' behavioral intentions in rural Pakistan. With traditional financial services deeply ingrained in the societal fabric, persuading rural communities of the advantages and convenience offered by digital alternatives is paramount. User-centric design principles, simplified interfaces, and localized content can enhance the accessibility and usability of digital financial platforms, thereby fostering their acceptance and adoption among rural populations (Hasan et al., 2021). By emphasizing on the tangible benefits and user-friendly features of digital financial services, stakeholders can overcome skepticism and resistance, paving the way for greater financial inclusion and empowerment in rural Sindh. Understanding the association between digital financial literacy, access to digital infrastructure, perceived utility, and ease of use is vital for promoting the usage of digital financial services in rural areas of Sindh. By addressing these factors comprehensively, stakeholders can empower rural communities with the knowledge and tools necessary to participate actively in the digital economy, thereby fostering financial inclusion and driving socio-economic development (Noor et al., 2020).

1.2 Problem Statement

The problem statement revolves around the lack of comprehensive research addressing the influence of digital finance education on the behavioral intention of using digital financial services in rural Sindh. Existing studies predominantly focus on urban areas or broader national contexts,

neglecting the unique dynamics and challenges present in rural regions (Azeez & Akhtar, 2021; Tariq et al., 2021). This knowledge gap damages efforts to develop targeted interventions and policies aimed at promoting financial inclusion in rural communities. Therefore, there is a pressing need to investigate how digital financial literacy, access to digital infrastructure, and perceived utility and ease of use of digital financial services interact to shape individuals' intentions to adopt these services in rural Sindh.

1.3 Research Gap

To analyze the impact of digital financial literacy on the behavioral intention to adopt digital financial services in rural Sindh, it's essential to address the existing research gap in this area. Despite the growing emphasis on digital financial inclusion globally, there remains a notable lack of studies specifically focusing on rural regions such as Sindh, Pakistan (Hasan et al., 2023; Noor et al., 2020). Existing literature predominantly concentrates on urban areas or broader national contexts, failing to capture the unique challenges and dynamics prevalent in rural settings. Moreover, while some studies have explored factors influencing the adoption of digital financial services, there is a lack of comprehensive research examining the specific role of digital financial literacy in rural communities (Hasan et al., 2021; Khan et al., 2019). This research gap is particularly pronounced concerning the intersection of digital financial literacy, access to digital infrastructure, and perceived utility and ease of use of digital financial services within the rural context of Sindh.

Furthermore, understanding how these traits relate to and influence people's behavioral intentions to use digital financial services is necessary to develop policies that successfully promote financial inclusion in rural areas. Bridging this research gap is imperative for policymakers, financial institutions, and development practitioners to tailor interventions that address the unique needs and challenges of rural populations in adopting digital financial services, ultimately fostering inclusive economic growth and empowerment in rural Sindh.

1.4 Research Questions

The research questions for this study are:

1: How does the level of digital financial literacy among rural inhabitants in Sindh affect their behavioral intention to use digital financial services?

2: What is the influence of access to digital infrastructure on the behavioral intention to adopt digital financial services in rural areas of Sindh?

3: How do factors such as perceived utility and ease of use of digital financial services impact the behavioral intention to use digital financial services among rural populations in Sindh?

1.5 Research Objectives

Research objectives of this study are as follows:

- To assess the level of digital financial literacy among rural inhabitants in Sindh and its impact on their behavioral intention to use digital financial services.
- To investigate the influence of access to digital infrastructure, including internet connectivity, mobile network coverage, and smartphone availability, on the behavioral intention to use digital financial services in rural areas of Sindh.
- To analyze the impact of perceived utility and ease of use of digital financial services on the behavioral intention to use digital financial services among rural populations in Sindh.

1.6 Research Significance

The practical significance of this research lies in its potential to inform policy formulation, strategic planning, and practical interventions aimed at enhancing financial inclusion and digital empowerment in rural Sindh. By identifying the factors influencing individuals' behavioral intentions to use digital financial services, this study offers actionable insights for policymakers, financial institutions, and development practitioners seeking to design targeted initiatives that address the specific needs and challenges of rural populations (Zahid & Haji Din, 2019).

Understanding the role of digital financial literacy, access to digital infrastructure, and perceived utility and ease of use of digital financial services can guide the development of educational programs tailored to improve individuals' knowledge and skills related to digital finance. Such programs can empower rural residents to make informed decisions regarding their financial transactions, thereby fostering greater financial resilience and economic independence (Twumasi et al., 2022). Moreover, the findings of this research can inform the deployment of digital infrastructure in rural areas, ensuring that investments are directed towards initiatives that maximize accessibility and usability for local communities. By aligning infrastructure

development efforts with the identified drivers of usage intentions, stakeholders can optimize resource allocation and enhance the effectiveness of digital financial services delivery in rural Sindh (Tariq et al., 2021).

Chapter 2

LITERATURE REVIEW

2.0 Introduction

The literature on digital financial literacy and behavioral intention to use digital financial services in rural settings, particularly in regions like Sindh, Pakistan, reveals a critical nexus between individuals' knowledge, skills, perceptions, and intentions concerning digital finance. While extensive research exists on financial literacy and technology adoption in urban contexts, there is a notable dearth of studies focusing on rural areas, where unique socio-economic, infrastructural, and cultural factors shape individuals' engagement with digital financial services (Tariq et al., 2021). This literature review seeks to fulfill this gap by integrating the existing knowledge on digital financial literacy, access to digital infrastructure, perceived utility and ease of use of digital financial services, and their collective influence on individuals' behavioral intentions in rural Sindh. By critically analyzing and integrating findings from diverse theoretical perspectives and empirical studies, this review aims to elucidate the key determinants and mechanisms driving individuals' intentions to adopt and register for Mobile banking services in rural contexts, thereby informing policy, practice, and future research directions in the field of financial inclusion and digital empowerment (Hasan et al., 2021).

2.1 Definition and Concepts

2.1.1 Digital Financial Literacy

Digital financial literacy (DFL) refers to the set of information, abilities, and attitudes that people need to have in order to manage the complexities of the digital financial world and effectively use digital financial services (DFS).At its core, DFL involves understanding fundamental financial concepts, such as budgeting, saving, borrowing, and investing, within the context of digital platforms and technologies. This includes proficiency in using digital devices, accessing online platforms, and leveraging financial applications to conduct various financial transactions securely and efficiently. One of the key elements of DFL is digital literacy which refer to the ability to use digital tools, software, and online platforms effectively. (Hasan et al., 2023). Digital literacy entails skills such as navigating the internet, using email, conducting online searches, and interacting with

digital interfaces. In relation to online financial services, digital literacy is essential for accessing banking websites and mobile applications, understanding online banking functionalities, and safeguarding personal and financial information while conducting digital transactions (Inder et al., 2022).

Moreover, DFL also entails knowledge of specific digital financial services and goods, such as peer-to-peer payment networks, digital wallets, mobile banking, and online investment platforms. Individuals with high levels of DFL are familiar with the features, functionalities, and benefits of these digital financial tools, allowing them to make informed decisions about which services best suit their financial needs and goals. Additionally, DFL involves understanding the risks associated with digital financial transactions, such as fraud, identity theft, and cybersecurity threats, and implementing appropriate measures to mitigate these risks effectively (Ibtasam et al., 2018). Furthermore, DFL extends beyond technical proficiency to include financial literacy, which encompasses understanding basic financial concepts, principles, and practices. Financial literacy involves knowledge of topics such as interest rates, credit scores, compound interest, inflation, and investment strategies. In the context of DFL, individuals need a solid understanding of these financial concepts to make sound financial decisions using digital financial services. For example, they need to comprehend the implications of interest rates and fees associated with digital banking products, evaluate the risks and returns of digital investment opportunities, and manage their digital financial accounts effectively to achieve their financial goals (Hassan et al., 2020).

Another essential component of DFL is the ability to evaluate the credibility and reliability of digital financial information and resources. With the proliferation of online financial content and resources, individuals must possess critical thinking skills to distinguish between accurate, trustworthy information and misleading or fraudulent content. This means looking over the terms and conditions of online financial services and products, verifying the reliability of financial websites, and, if necessary, seeking advice from reputable firms or financial experts.(Jariyapan et al., 2022). Moreover, DFL encompasses behavioral aspects related to digital financial decision-making, such as attitudes, motivations, and confidence levels regarding digital financial services. Individuals with high levels of DFL exhibit positive attitudes towards adopting digital financial tools, feel confident in their ability to get online financial services effectively, and are motivated to integrate these services into their financial routines. Conversely, individuals with low levels of

DFL may experience skepticism, anxiety, or reluctance towards using digital financial services due to concerns about privacy, security, or unfamiliarity with digital technologies (Khan, 2022).

2.1.2 Access to Digital Infrastructure

Access to digital infrastructure refers to the ability of individuals and communities to utilize and benefit from various digital technologies, networks, and platforms that facilitate connectivity, communication, and access to information and services. Digital infrastructure encompasses a wide range of components, including telecommunications networks, internet connectivity, hardware devices (such as computers, smartphones, and tablets), software applications, and digital platforms. People need access to digital infrastructure in order to contribute in the economy of digitilization, they have access to opportunities for employment and education, engage in online banking and e-commerce, get essential services like healthcare and government services, and keep up relationships with their families and communities.

(Tamilselvi & Balaji, 2019).

One key aspect of access to digital infrastructure is physical infrastructure, which includes the physical components necessary to establish and maintain digital connectivity. This includes telecommunications infrastructure such as fiber optic cables, mobile network towers, satellite systems, and broadband internet connections. Physical infrastructure also encompasses the hardware devices and equipment required to access digital services, such as computers, smartphones, tablets, routers, and modems (Shahzad et al., 2022). Ensuring the availability and affordability of physical infrastructure is crucial for bridging the digital divide and expanding access to digital technologies, particularly in underserved and remote areas. Moreover, access to digital infrastructure encompasses technological infrastructure, which refers to the underlying technologies and protocols that enable digital communication and data transmission. This includes internet protocols, networking standards, data encryption technologies, and cybersecurity measures designed to protect digital infrastructure from threats and vulnerabilities. Technological infrastructure plays a critical role in ensuring the reliability, security, and interoperability of digital networks and platforms, thereby facilitating seamless connectivity and access to digital services for individuals and communities (Rasheed et al., 2019).

Furthermore, access to digital infrastructure involves social and economic factors that influence individuals' ability to utilize digital technologies effectively. This includes factors such as affordability, affordability, digital literacy, language barriers, cultural norms, and socio-economic disparities. Individuals and communities with limited financial resources or low levels of digital literacy may face barriers to accessing and utilizing digital infrastructure effectively, hindering their ability to benefit from the opportunities afforded by digital technologies. In order to ensure that everyone can fully participate in the digital economy and society, as well as to offer fair access to digital infrastructure, it is vital that these socioeconomic barriers could be addressed.(Khan et al., 2019).

Another crucial aspect of access to digital infrastructure is regulatory and policy frameworks that govern the deployment, management, and use of digital technologies and networks. Regulatory policies play a critical role in shaping the accessibility, affordability, and quality of digital infrastructure by establishing standards, guidelines, and incentives for infrastructure development and investment (Khan & Chaipoopirutana, 2020). Effective regulatory frameworks promote competition, innovation, and investment in digital infrastructure, thereby enhancing access and affordability for consumers and businesses alike. Additionally, policies aimed at promoting digital inclusion, such as subsidies for low-income households, incentives for infrastructure deployment in underserved areas, and initiatives to improve digital literacy, can help bridge the digital divide and ensure equitable access to digital infrastructure for all (Rahman et al., 2020).

2.1.3 Perceived Utility and Ease of Use

Perceived utility and ease of use are two critical concepts in the field of technology adoption and acceptance, particularly concerning digital financial services (DFS) and other digital technologies. Perceived utility is the extent to which individuals believe that using a certain technology or service will increase their efficacy, productivity, convenience, or overall satisfaction in achieving specific goals or satisfying certain needs.It encompasses individuals' subjective perceptions of the benefits, advantages, and value proposition associated with using the technology or service, as well as their expectations regarding its usefulness in addressing their needs or solving their problems (Prasad et al., 2018).

In the context of DFS, perceived utility plays a significant role in influencing individuals' attitudes and intentions towards adopting and using digital banking platforms, mobile payment apps, online

investment tools, and other digital financial products. If people believe that digital financial services provide real benefits, they are more inclined to adopt them such as greater convenience, accessibility, speed, security, cost-effectiveness, and flexibility compared to traditional financial methods. For example, individuals may perceive digital banking apps as providing 24/7 access to account information, faster and more convenient transactions, lower fees, and a wider range of banking services compared to visiting a physical bank branch (Pandey et al., 2022). Ease of use refers to the extent to which individuals perceive a technology or service as being easy to use, learn, navigate, and operate, without requiring excessive effort, time, or cognitive resources. It encompasses individuals' subjective assessments of the usability, user-friendliness, intuitiveness, simplicity, and learnability of the technology or service interface, features, and functionalities. Ease of use is closely related to usability principles, such as clarity, consistency, efficiency, error tolerance, and feedback, which determine how effectively individuals can interact with and accomplish tasks using the technology or service (Nugroho & Apriliana, 2022).

In the light of digital financial services, ease of use is a critical determinant of individuals' willingness to adopt and integrate digital banking platforms, mobile payment apps, and other digital financial tools into their daily financial routines. People's believe that using digital financial services is simple, easy, and hassle-free, they are more inclined to adopt them even if they have limited technical knowledge or experience with digital technologies. For example, individuals may prefer mobile payment apps with simple and intuitive user interfaces, streamlined transaction processes, and clear instructions, as they minimize the need for extensive training, support, or troubleshooting (Khan et al., 2022). Perceived utility and ease of use are closely interconnected, as individuals' perceptions of the usefulness of a technology or service are often influenced by their experiences with its usability and user experience. A technology or service that is perceived as highly useful but difficult or cumbersome to use may face resistance or reluctance from potential users, leading to low adoption rates or dissatisfaction with the technology. Conversely, a technology or service that is perceived as easy to use but lacking in utility may fail to gain traction or sustain user engagement over time (Kumari & Devi, 2022).

2.1.4 Behavioral Intention to Use Digital Financial Services

Behavioral intention to use digital financial services (DFS) refers to individuals' willingness and readiness to adopt and utilize digital platforms, technologies, and channels for conducting financial

transactions, managing their finances, and accessing financial services. It includes people's intentions to engage in particular behaviours related to digital finance, such as opening digital bank accounts, making mobile payments, transferring funds online, or investing through digital platforms, as well as their cognitive attitudes, subjective norms, and perceived behavioral control toward using these services (Liu et al., 2021). At its core, behavioral intention to use DFS is influenced by individuals' perceptions of the benefits, risks, ease of use, usefulness, and social norms associated with using digital financial services compared to traditional financial methods. Individuals are more likely to express intention to use DFS if they perceive them as offering advantages such as convenience, accessibility, speed, security, cost-effectiveness, and flexibility in managing their finances and conducting transactions. Conversely, concerns about privacy, security, complexity, reliability, or unfamiliarity with digital technologies may dampen individuals' intentions to adopt and use digital financial services (NOREEN et al., 2021).

Subjective norms are people's perceptions of the social pressures, expectations, and influences from significant others—friends, family, classmates, and coworkers—about the use of digital financial services. Positive subjective norms, characterized by perceptions of social approval, encouragement, or endorsement of using DFS, can strengthen individuals' intentions to engage in digital financial behaviors. Conversely, negative subjective norms, such as skepticism, resistance, or discouragement from others regarding DFS usage, may weaken individuals' intentions and willingness to adopt digital financial services (Noor et al., 2020). Perceived behavioral control refers to individuals' perceptions of their ability to perform the behavior in question, such as using digital financial services, based on factors such as self-efficacy, perceived ease of use, and perceived control over external factors. Individuals with high levels of perceived behavioral control, who feel confident in their ability to navigate digital platforms, overcome technical challenges, and manage potential risks associated with DFS usage, are more likely to express stronger intentions to use digital financial services (Mahmood et al., 2022).

In addition to the traits identified by TPB, additional theoretical frameworks such as the technology acceptance model (TAM) and the unified theory of acceptance and use of technology (UTAUT) offer insights into the behavioral intention drivers to utilize digital financial services. TAM posits that individuals' intention to use technology, including digital financial services, is influenced by perceived usefulness and perceived ease of use (Mustafa et al., 2019). UTAUT extends TAM by

incorporating additional factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions, which influence individuals' intentions and actual usage behavior. Moreover, external factors such as demographic characteristics, socio-economic status, cultural norms, institutional factors, and contextual factors may also influence individuals' behavioral intention to use Mobile money. For example, factors such as income levels, educational attainment, internet access, digital literacy, trust in financial institutions, regulatory environment, and availability of support services may shape individuals' attitudes, perceptions, and intentions towards DFS adoption and usage (Mahmood et al., 2022).

2.2 Determinants of Digital Financial Literacy

Digital financial literacy (DFL) is a multifaceted concept influenced by a myriad of determinants spanning individual, socio-economic, cultural, and institutional dimensions. Understanding these determinants is essential for policymakers, financial institutions, educators, and development practitioners seeking to promote financial inclusion and digital empowerment in diverse populations. This comprehensive analysis explores the key determinants of DFL, drawing on insights from existing literature and empirical studies across various contexts (Azeez & Akhtar, 2021).

Individual-level determinants of DFL encompass factors such as educational attainment, age, gender, income level, occupation, and prior experience with digital technologies and financial services. Research suggests that person with advance levels of education tend to exhibit greater digital literacy skills, including proficiency in using digital devices and navigating online platforms, which positively influence their DFL (Dash & Mohanta, 2024). Similarly, younger generations and high earners are more likely to have access to digital financial platforms and be proficient in online transaction processing. However, gender disparities persist, with women often lagging men in terms of digital literacy and access to financial services, emphasizing the necessity for specific measures to effectively tackle and eradicate this gap (De Leon, 2019).

Socio-economic determinants play a significant role in shaping individuals' DFL, particularly in low-income and marginalized communities. Factors such as household income, employment status, access to formal banking services, and geographic location influence individuals' ability to access and utilize digital financial services. Research indicates that individuals from lower-income households and rural areas are less likely to have access to formal banking infrastructure and digital

technologies, limiting their opportunities to develop DFL (Khan, 2022). Moreover, socio-economic disparities exacerbate digital divides, with marginalized populations facing barriers such as limited internet connectivity, affordability constraints, and language barriers that hinder their participation in the digital economy (Jariyapan et al., 2022).

Cultural factors also influence individuals' DFL by shaping their attitudes, beliefs, and social norms regarding digital finance and technology adoption. Cultural norms on risk aversion, privacy, trust, and social networks may influence or prevent people from using digital financial services. For example, in some cultures, there may be a preference for face-to-face interactions and traditional banking methods, leading to skepticism or resistance towards digital finance. Conversely, in cultures where digital technologies are embraced and trusted, individuals may exhibit higher levels of DFL and willingness to adopt digital financial services (Inder et al., 2022).

Institutional determinants encompass regulatory policies, financial infrastructure, industry practices, and institutional support mechanisms that shape the availability, accessibility, and usability of digital financial services. Regulatory frameworks play a crucial role in fostering an enabling environment for digital finance by establishing standards, guidelines, and safeguards to protect consumers, promote innovation, and ensure financial stability. For instance, policies promoting digital identification systems, electronic Know Your Customer (e-KYC) processes, and interoperable payment systems can enhance individuals' access to digital financial services and facilitate the progress of DFL (Ibtasam et al., 2018).

Financial infrastructure, including telecommunications networks, internet connectivity, digital payment systems, and banking infrastructure, is crucial for facilitating individuals' contribution in the digital economy and enhancing their DFL (Hasan et al., 2021). Investments in expanding digital infrastructure, particularly in underserved and rural areas, can improve individuals' access to digital financial services and provide opportunities for skill development and capacity building. Moreover, industry efforts to design user-friendly digital interfaces, develop innovative financial products, and provide financial education and support services can enhance individuals' DFL and confidence in using digital financial services (Hasan et al., 2023).

Educational interventions and awareness campaigns are critical for promoting DFL and enabling people to make wise financial decisions in the digital era. Financial literacy programs, digital skills training, and outreach initiatives can equip individuals with the knowledge, skills, and confidence

to navigate digital financial platforms, understand financial products and services, and protect themselves from risks such as fraud and identity theft. Moreover, collaborative efforts between governments, financial institutions, non-profit organizations, and community-based groups can leverage existing resources and networks to reach diverse populations and promote DFL at scale (Khan et al., 2019). The determinants of DFL are multifaceted and interconnected, encompassing individual, socio-economic, cultural, and institutional factors that shape individuals' knowledge, skills, attitudes, and behaviors related to digital finance. Addressing these determinants requires a holistic approach that combines regulatory reforms, investments in digital infrastructure, educational interventions, and industry initiatives to promote financial inclusion, digital empowerment, and socio-economic development. By understanding and addressing the determinants of DFL, stakeholders can unlock the transformative potential of digital financial services to improve individuals' livelihoods, foster economic growth, and build more inclusive and resilient financial systems (Hassan et al., 2020).

2.3 Determinants of Access to Digital Infrastructure

Access to digital infrastructure is a critical determinant of individuals' ability to harness the benefits of digital technologies and participate fully in the digital economy. This comprehensive analysis examines the key determinants of access to digital infrastructure, drawing on insights from existing literature and empirical studies across various contexts. One of the primary determinants of access to digital infrastructure is geographical location, particularly in rural and remote areas where infrastructure deployment may be limited or non-existent (Khan & Chaipoopirutana, 2020). Factors such as population density, topography, and distance from urban centers influence the availability and quality of digital infrastructure, including telecommunications networks, internet connectivity, and electricity supply. Individuals living in rural and remote areas often face challenges such as poor network coverage, slow internet speeds, and unreliable electricity supply, which hinder their ability to access and utilize digital technologies effectively (Kumari & Devi, 2022).

Socio-economic status is another key determinant of access to digital infrastructure, with income level, education, and employment status playing a significant role in shaping individuals' ability to afford and utilize digital technologies (Liu et al., 2021). Research indicates that individuals from lower-income households are less likely to have access to digital devices, internet connectivity,

and digital skills training, restricting their opportunities to take part in the online marketplace and access basic amenities such as schooling and medical care, and financial services. Moreover, disparities in educational attainment and employment opportunities contribute to digital divides, with marginalized populations facing barriers to acquiring digital literacy and accessing digital infrastructure (NOREEN et al., 2021).

Infrastructure investment and government policies play a significant role in shaping access to digital infrastructure by creating an enabling environment for infrastructure development, deployment, and maintenance. Public-private partnerships, regulatory reforms, and incentives for infrastructure investment can stimulate private sector participation in expanding digital infrastructure, particularly in underserved and rural areas where market forces alone may not be sufficient to address infrastructure gaps (Noor et al., 2020). Moreover, government policies such as universal service obligations, spectrum allocation, and infrastructure subsidies can incentivize infrastructure providers to prioritize investments in areas with low connectivity and address inequalities in access to digital infrastructure (Mahmood et al., 2022).

Technological advancements and innovation also influence access to digital infrastructure by driving improvements in network coverage, internet speeds, and affordability of digital technologies. For example, the rollout of 5G networks, satellite internet services, and high-speed broadband infrastructure can expand access to digital infrastructure in remote and rural areas, where traditional fixed-line infrastructure may be impractical or cost-prohibitive (Zahid & Haji Din, 2019). Moreover, innovations in low-cost digital devices, solar-powered technologies, and last-mile connectivity solutions can enhance individuals' ability to access and utilize digital technologies in resource-constrained environments (Tariq et al., 2021).

Social and cultural factors shape individuals' attitudes, perceptions, and behaviors towards digital infrastructure and technology adoption, influencing their willingness and ability to access and utilize digital technologies (Mustafa et al., 2019). For example, social networks, community organizations, and peer influences can play a significant role in facilitating or hindering individuals' adoption of digital technologies, particularly in contexts where trust, social norms, and collective decision-making are prevalent. Moreover, cultural beliefs, values, and preferences regarding privacy, security, and digital literacy may influence individuals' attitudes towards using digital technologies and engaging with digital infrastructure (Twumasi et al., 2022).

Institutional support mechanisms, such as digital literacy programs, community centers, and public libraries, are essential for promoting access to digital infrastructure and empowering individuals to develop the skills and knowledge necessary to utilize digital technologies effectively (Shahzad et al., 2022). By providing training, support, and resources, these institutions can help individuals overcome barriers such as lack of digital literacy, awareness, and confidence, thereby enhancing their ability to access and utilize digital infrastructure for personal, educational, and economic purposes. Moreover, partnerships between government, civil society, and the private sector can leverage existing infrastructure and resources to expand access to digital infrastructure and promote digital inclusion at the community level (Tamilselvi & Balaji, 2019).

Access to digital infrastructure is influenced by a complex interplay of geographical, socio-economic, institutional, technological, and cultural factors that shape individuals' ability to access and utilize digital technologies effectively (Rasheed et al., 2019). Addressing the determinants of access to digital infrastructure requires a multi-faceted approach that combines infrastructure investment, regulatory reforms, technological innovation, social support mechanisms, and community engagement initiatives to bridge digital divides, promote digital inclusion, and unlock the transformative potential of digital technologies for socio-economic development. By understanding and addressing these determinants, stakeholders can create an inclusive and resilient digital infrastructure ecosystem that enables individuals and communities to thrive in an increasingly digital world (Nugroho & Apriliana, 2022).

2.4 Determinants of Access to Perceived Utility and Ease of Use

People's adoption and use of digital technologies, such as digital financial services (DFS) and other digital platforms, are significantly influenced by perceived usefulness and simplicity of use.This comprehensive analysis explores the key determinants of access to perceived utility and ease of use, drawing on insights from existing literature and empirical studies across various contexts. One of the primary determinants of access to perceived utility and ease of use is the design and functionality of digital technologies and platforms (Rahman et al., 2020). User-centric design principles, intuitive interfaces, and seamless user experiences enhance individuals' perceptions of utility and ease of use, making it easier for them to navigate digital platforms, access desired features and functionalities, and accomplish tasks efficiently. Conversely, poorly designed

interfaces, complex workflows, and technical glitches can frustrate users and diminish their perceived utility and ease of use, leading to lower adoption and usage rates (Prasad et al., 2018).

Technological advancements and innovation play a crucial role in shaping access to perceived utility and ease of use by driving improvements in digital platforms' features, functionalities, and performance (Pandey et al., 2022). For example, advancements in artificial intelligence, machine learning, and natural language processing enable digital platforms to personalize user experiences, anticipate user needs, and automate routine tasks, thereby enhancing perceived utility and ease of use. Moreover, innovations in user interface design, responsive web development, and cross-platform compatibility contribute to a seamless and intuitive user experience across devices and channels, further enhancing individuals' perceptions of utility and ease of use (Nugroho & Apriliana, 2022). Another determinant of access to perceived utility and ease of use is individuals' digital literacy and familiarity with digital technologies. Individuals with higher levels of digital literacy possess the knowledge, skills, and confidence to navigate digital platforms effectively, understand their features and functionalities, and leverage them to accomplish various tasks. Moreover, individuals' prior experience with digital technologies and platforms influences their perceptions of utility and ease of use, as familiarity with similar interfaces and workflows enhances their ability to adapt to new digital platforms and technologies (Prasad et al., 2018).

Socio-economic factors such as income level, education, and employment status also influence access to perceived utility and ease of use by shaping individuals' ability to afford and utilize digital technologies effectively (Azeez & Akhtar, 2021). Research indicates that individuals from higher-income households and those with higher levels of education are more likely to perceive digital technologies as useful and easy to use, as they possess the financial resources, digital literacy skills, and access to support networks necessary to navigate digital platforms and overcome technical challenges. Conversely, individuals from lower-income households and marginalized communities may encounter challenges such as affordability constraints, limited utilization of electronic devices and internet connectivity, and lack of digital literacy training, which hinder their ability to access and utilize digital technologies effectively (Khan, 2022).

Social and cultural factors shape individuals' perceptions of utility and ease of use by influencing their attitudes, beliefs, and behaviors towards digital technologies and platform adoption. For example, social norms, peer influences, and cultural values regarding privacy, security, and

trustworthiness can impact individuals' willingness to engage with digital platforms and share personal information online. Moreover, cultural preferences, language barriers, and socio-cultural contexts influence individuals' expectations and preferences regarding user interface design, content localization, and customer support, which in turn affect their perceptions of utility and ease of use (Jariyapan et al., 2022).

Institutional support mechanisms such as digital literacy programs, user training, and customer support services are essential for promoting access to perceived utility and ease of use by empowering individuals to develop the skills and knowledge necessary to navigate digital platforms effectively (De Leon, 2019). By providing training, support, and resources, these institutions can help individuals overcome barriers such as lack of digital literacy, awareness, and confidence, thereby enhancing their ability to access and utilize digital technologies for personal, educational, and economic purposes. Moreover, partnerships between government, civil society, and the private sector can leverage existing infrastructure and resources to expand access to digital literacy programs and support services, particularly in underserved and marginalized communities (Dash & Mohanta, 2024).

Access to perceived utility and ease of use is influenced by a complex association of technological, individual, socio-economic, cultural, and institutional factors that shape individuals' perceptions and experiences with digital technologies and platforms (Ibtasam et al., 2018). Addressing the determinants of access to perceived utility and ease of use requires a multi-faceted approach that combines user-centric design principles, technological innovation, digital literacy programs, socio-cultural awareness, and institutional support mechanisms to enhance individuals' perceptions of utility and ease of use, promote digital inclusion, and unlock the transformative potential of digital technologies for socio-economic development. By understanding and addressing these determinants, stakeholders can create a more inclusive and user-friendly digital ecosystem that enables individuals and communities to thrive in an increasingly digital world (Tamilselvi & Balaji, 2019).

2.5 Determinants of Behavioral Intention to Use Digital Financial Services

Determinants of behavioral intention to use digital financial services (DFS) are multifaceted and encompass individual, socio-economic, technological, and institutional factors that influence individuals' attitudes, perceptions, and intentions towards adopting and utilizing digital financial

platforms and technologies. This comprehensive analysis examines the key determinants of behavioral intention to use DFS, drawing on insights from existing literature and empirical studies across various contexts. Individual-level determinants play a significant role in shaping behavioral intention to use DFS, including factors such as perceived usefulness, perceived ease of use, trust, risk perceptions, and subjective norms (Rasheed et al., 2019). According to the technology acceptance model (TAM) and the theory of planned behavior (TPB), individuals' attitudes towards using DFS are influenced by their perceptions of the benefits, advantages, and ease of use associated with digital financial platforms and services. Positive attitudes towards DFS, driven by perceptions of utility, convenience, and efficiency, are likely to enhance individuals' intentions to adopt and use these services (Zahid & Haji Din, 2019).

Moreover, trust and risk perceptions influence individuals' behavioral intention to use DFS by shaping their confidence in the security, reliability, and integrity of digital financial platforms and transactions. Research indicates that individuals' trust in financial institutions, technology providers, and regulatory authorities positively correlates with their willingness to adopt digital financial services, as trust enhances perceived utility and reduces perceived risks associated with using DFS. Conversely, concerns about privacy, security breaches, fraud, and identity theft can erode individuals' trust and confidence in digital financial technologies, leading to lower intentions to use DFS (Prasad et al., 2018).

Socio-economic determinants also influence behavioral intention to use DFS by shaping individuals' access to digital technologies, financial literacy, income level, and demographic characteristics (Nugroho & Apriliana, 2022). Research suggests that individuals from higher-income households, younger age groups, and urban areas are more likely to adopt and use DFS, as they possess the financial resources, digital literacy skills, and access to digital infrastructure necessary to engage effectively in digital transactions. Moreover, educational attainment, employment status, and prior experience with digital technologies influence individuals' perceptions of utility, ease of use, and confidence in using DFS, thereby shaping their intentions to adopt and utilize these services (Khan & Chaipoopirutana, 2020).

Technological factors such as user interface design, platform functionality, and service quality also influence behavioral intention to use DFS by enhancing individuals' user experience and satisfaction. User-centric design principles, intuitive interfaces, and seamless user experiences

contribute to a positive perception of utility and ease of use, making it easier for individuals to navigate digital financial platforms, access desired features and functionalities, and accomplish financial tasks efficiently (Liu et al., 2021). Moreover, innovations in digital banking services, mobile payment apps, and online investment platforms can enhance individuals' perceptions of utility and convenience, thereby increasing their intentions to adopt and use DFS (Tariq et al., 2021).

Institutional determinants, including regulatory policies, financial infrastructure, and industry practices, shape behavioral intention to use DFS by creating an enabling environment for digital finance adoption and usage (Zahid & Haji Din, 2019). Regulatory frameworks play a crucial role in fostering consumer trust, protecting individuals' rights, and promoting innovation in digital financial services. For example, policies promoting consumer protection, data privacy, and cybersecurity can enhance individuals' confidence in using DFS, thereby increasing their intentions to adopt and utilize these services. Moreover, investments in digital infrastructure, interoperable payment systems, and financial inclusion initiatives can expand access to DFS and provide opportunities for individuals to engage in digital transactions (Hassan et al., 2020).

Cultural factors such as social norms, peer influences, and cultural values also influence behavioral intention to use DFS by shaping individuals' attitudes, beliefs, and behaviors towards digital finance adoption and technology usage (Jariyapan et al., 2022). For example, in some cultures, there may be a preference for cash transactions or face-to-face interactions with bank tellers, leading to skepticism or resistance towards using DFS. Conversely, in cultures where digital technologies are embraced and trusted, individuals may exhibit higher intentions to adopt and use DFS, driven by social norms, peer influences, and perceived social status associated with digital finance adoption (Azeez & Akhtar, 2021).

Determinants of behavioral intention to use DFS are multifaceted and interconnected, encompassing individual, socio-economic, technological, and institutional factors that shape individuals' attitudes, perceptions, and intentions towards adopting and utilizing digital financial platforms and technologies (Khan, 2022). Addressing these determinants requires a holistic approach that combines user-centric design principles, regulatory reforms, financial literacy programs, and industry initiatives to promote trust, enhance user experience, and foster adoption of DFS. By understanding and addressing these determinants, stakeholders can create an enabling

environment for digital finance adoption and usage, thereby promoting financial inclusion, empowerment, and socio-economic development in diverse populations (Kumari & Devi, 2022).

2.6 Theoretical Background

Theoretical background provides a framework for understanding the underlying principles and mechanisms that govern phenomena under investigation. In the context of the research on the impact of digital financial literacy on behavioral intention to use digital financial services in rural Sindh, one theory that offers valuable insights is the Technology Acceptance Model (TAM). Developed by Fred Davis in the late 1980s, TAM is a widely recognized theoretical framework that explains individuals' acceptance and usage of technology-based innovations (Davis, 1989).

Perceived ease of use and perceived utility are two key factors that affect people's behavioral intention to use technology, according to TAM. Perceived usefulness is the degree to which an individual believes that using a certain technology would enhance their productivity at work or make tasks simpler to do (Marangunić & Granić, 2015). In the context of digital financial services, individuals are more likely to intend to use these services if they perceive them as beneficial for managing their finances, conducting transactions, and accessing financial information conveniently and efficiently. For instance, individuals may perceive digital banking apps as useful for providing 24/7 access to account information, facilitating fast and secure transactions, and offering a wider range of banking services compared to traditional brick-and-mortar branches (Granić & Marangunić, 2019).

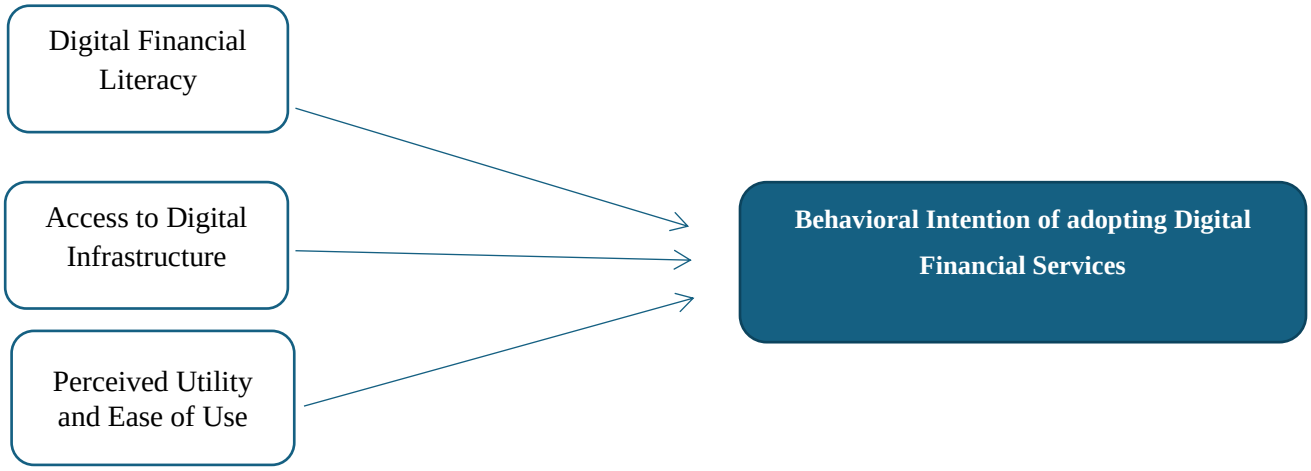
On the other hand, perceived ease of use indicates an individual's belief about how easy and effortless it would be to utilize a technology. It consists of components including the ease of use and navigation of the user interface, as well as the intuitiveness of the features and capabilities. In the context of digital financial services, individuals are more likely to intend to use these services if they perceive them as easy to use, even if they have limited technical knowledge or experience with digital technologies. For example, individuals may prefer mobile payment apps with user-friendly interfaces, streamlined transaction processes, and clear instructions, as they minimize the need for extensive training, support, or troubleshooting (Davis et al., 2023).

Moreover, TAM suggests that perceived usefulness and perceived ease of use directly influence individuals' attitudes towards using a technology, which in turn shapes their behavioral intention

to use it. Positive attitudes towards digital financial services, driven by perceptions of utility and ease of use, are likely to enhance individuals' intentions to adopt and use these services. Conversely, negative attitudes arising from concerns about usability, complexity, or lack of perceived benefits may dampen individuals' intentions and willingness to adopt digital financial services (Davis et al., 2023). Moreover, TAM suggests that the link between perceived usefulness, perceived ease of use, attitudes, and behavioral intention may be moderated by extrinsic variables such as social influence, enabling situations, and perceived behavioral control. Social influence is the term used to describe how people's views and intentions toward utilizing technology are influenced by social norms, peer pressure, and subjective norms.

Facilitating conditions encompass factors such as access to resources, technical support, and training that facilitate technology usage. Perceived behavioral control reflects individuals' perceived ability to overcome obstacles and barriers to using a technology effectively (Rafique et al., 2020).

2.7 Conceptual Framework



2.8 Research Hypotheses

Following are the Hypothesis of this research study:

H1: Increased levels of digital financial literacy among rural inhabitants in Sindh positively correlate with higher behavioral intention to use digital financial services.

H2: Enhanced access to digital infrastructure directly influences greater behavioral intention to use digital financial services in rural areas of Sindh.

H3: Improved perceived utility and ease of use of digital financial services directly lead to stronger behavioral intention to use these services among rural populations in Sindh.

Chapter 3

RESEARCH METHODOLOGY

3.0 Introduction

In order to characterize, explain, and foresee occurrences in order to have some control over them, a study employs a range of approaches to research a specific problem. Research methodology is the collection of techniques and approaches used to gather, organize, analyze, and evaluate data related to a specific topic, according to Mukherjee (2019). As part of the study, a thorough assessment of the reliability and accuracy of the research project is conducted. Mukherjee (2019) presented the research onion idea, which ensures that all study designs, strategies, data gathering, analysis, and sample processes are carried out with caution. This section will look at the methods and perspectives that were employed to look at and choose methods.

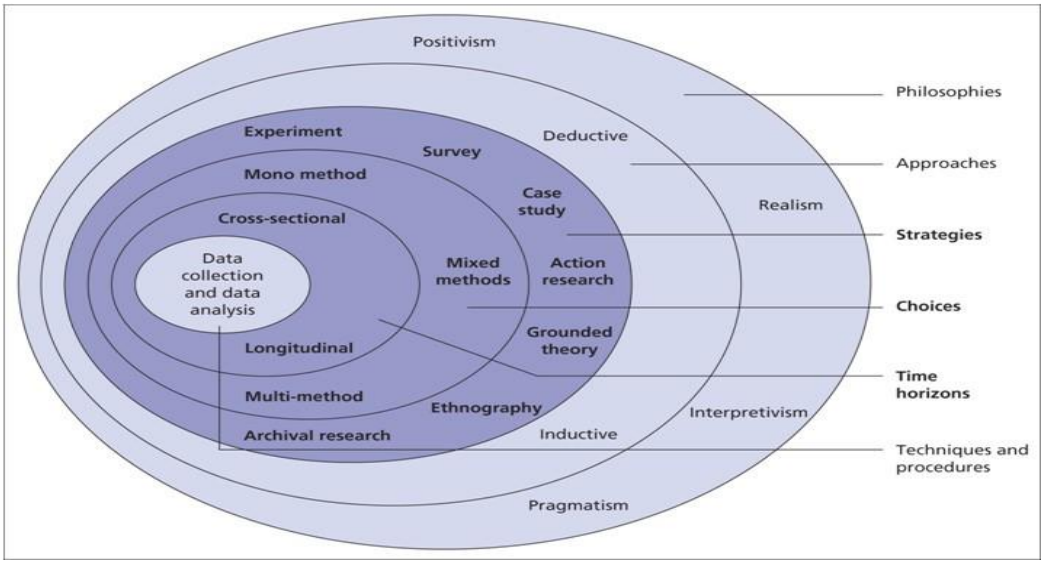


Figure 1: Research Onion

3.1 Research Design

The research onion delineated various methodologies for conducting the study, offering tools such as questionnaires, action research, and interviews in addition to an ongoing strategy predicated on the information received and the goals of the study (Babii, 2020). Saunders et al. (2016) presented

the concept known as research onion to indicate that a researcher would have to go through each of the stages of methodology development which, according to the authors, is like a branch on a tree of research methodology. To guide their studies, researchers can provide a research design that is a roadmap to the study's general structure and the methods used. There are two main classifications of research designs, which are qualitative and quantitative. This research followed a specific method. Data for this study were gathered after the communication was concluded (Ryder etal., 2020). On the other hand, quantitative research allows analysis according to the respondents' feedback and with such analysis, the researcher explores the differences, making decisions by considering the audience's opinion. The present research utilised research method to assess the role of digital financial literacy on behavioural intention to adopt digital financial services In Rural Sindh, consequently the study adopted quantitative research approach in this regard.

3.2 Research Philosophy

In the area of research, people work on the principles, strategies, and purposes of research. In the context of doing a study, this defines the measures taken by a researcher in order to transform ideas into meaning (Patel & Patel, 2019). Research philosophy plays a significant role in defining objectives, characteristics of the study and the framework in which data collection, analysis, and interpretation will be conducted. As delineated by Al Ababneh (2020), research philosophy is categorized into four classifications: included positivism, realism, pragmatism, and interpretivism approaches.

The research selected positivism as its basic research paradigm. Positivism focuses on the perceived realism of data obtained through observations. This research philosophy was adopted because it was consistent with the research objectives and purpose of data collection. This philosophy was chosen because it is methodical in collecting and analyzing data, making it appropriate for the study goal, which is to identify a cause-and-effect relationship between the independent and dependent variables (digital financial literacy, access to digital infrastructure, perceived usefulness, and perceived ease of use) and the dependent variable (behavioral intention to use digital financial services), to measure factors and generate outcomes that can be universally applied.

3.3 Research Approach

The research methodology describes the processes for collecting, assessing, and analyzing data depending on certain assumptions. It depends on the type of research question in the study as well as the approach to data analysis used (Snyder, 2019). Two primary research approaches exist: The two main branches of reasoning are deductive and inductive. In this research, a deductive approach was used. The deductive approach entails coming up with hypotheses prior to gathering data, unlike the inductive approach. This methodology was deemed appropriate for the study as it started with research hypotheses and aimed at proving them via evidential findings. The deductive method of research ensured that the research process was systematic and allowed for a rigorous investigation of the theories and hypotheses associated with the research problem.

3.4 Research Strategy

The present study utilized survey methodology, which is one of the available research strategies alongside case studies and experiments. In this study, the chosen approach involved employing a survey format, which included administering a questionnaire consisting of inquiries. The idea of the study was to evaluate the hypotheses supported by the participants' feedback. The rationale for choosing a survey method was based on the practical consideration of the researchers to eventually obtain the required data from respondents. By carrying out the survey, data was collected from a sample and this made the findings generalize to a larger population. This was beneficial for the goals of the study as findings could be made regarding trends, opinions, and experiences of people living in rural regions of Sindh.

3.5 Research Type

This research adopts a correlational research design to explore the relationships among digital financial literacy, access to digital infrastructure, perceived utility and ease of use and behavioral intention of adopting digital financial services (Patel & Patel 2019).

3.6 Unit of Analysis

The focus of the research was on individuals living in rural areas of Sindh which were deemed important in providing information on the investigated variables.

3.7 Population and Sample

The target population refers to a group of people, businesses, or other subjects that are relevant to the researcher's study (Babii, 2020). Since the specific number of people living in the rural areas of Sindh is not known, the respondents for the survey were mostly from these regions and the questionnaires collected from them after the survey were taken into consideration for this study. Due to limited time and availability of resources the researcher tried his best to collect data from people of different demography of rural area of Sindh. A survey link was distributed to a total of 300 residents in rural areas of Sindh, yielding 250 completed questionnaires. Thus, the data analysis for the study was grounded on the 250 responses obtained from individuals residing in rural areas of Sindh during the data collection. Furthermore, the following formula was used for estimating the required sample size:

$$SS = [Z^2 p\ (1 - p)]/\ C^2$$

Where,

- *SS* = Sample size
- *Z* = Given *Z* value
- *p* = Percentage of population
- *C* = Confidence level
- *Pop* = Population

3.8 Sampling Technique

For this research, Convenience sampling was used because the researcher has no prior knowledge with the population and is suitable for the study when the population is unknown (Al Ababneh, 2020). This is a quick method of selecting people in the population to participate in a study since they are willing to do so. All the participants received invitations to complete surveys and to be involved in the study's survey. Participants were recruited through word-of-mouth statements after appeals to please fill the survey and be part of the research were made. The use of convenience sampling made it easier to collect data from participants who were easily accessible and willing to

be assigned. The decision to opt for convenience sampling was mainly influenced by factors such as participant availability and study constraints including convenience, funding, and time. Although it can inherit bias, convenience sampling made it easier to administer data among participants who are easily accessible given the study limitations. Despite its drawbacks, this method was useful for the understanding of the research objectives; given that generalization of the findings was not the aim of the study.

3.9 Research Instrument

Based on the literature review, a survey was conducted to examine the relationship between different study factors. The survey was conducted through Google Forms and is included in the appendix of the document. It was attained through a series of survey inquiries and covered all the aspects of the study: digital financial literacy, access to the basic infrastructure, perceived usefulness and ease of use (as independent variables) and the behavioral intention to use the digital financial services (as the dependent variable). Based on prior research, 24 questions (6 for each variable) were included in the survey to measure digital financial literacy, accessibility of digital infrastructure, perceived usefulness and ease of use and behavioral intentions towards using digital financial services. Each question was answered on a 5-point Likert scale where 1 denoted disagree and 5 denoted agree.

3.10 Data Collection Procedure

Data collection is the act of obtaining data, information, evidence, and other documents or materials from various sources (Newman and Gough, 2020). Fundamentally, the researchers use data to improve their research methods and techniques. Research methodology in this study involved the collection of data that was consistent with the goals of the research. Primary data is more reliable and accurate than secondary data since it is gathered from the current time instead of from earlier periods. The method used to capture data for this study was through a survey. It enabled them to gather data on offered experiences and other intangible realities like words, experiences, feelings, and emotions in the surveys.

The study employed the use of an online questionnaire through Google Forms as the means of data collection. The questionnaire can be found in the appendix section. The link to the Google Forms was provided to the participants as an invitation to fill the questionnaire. The questionnaire was

distributed electronically on different social media platform and 250 participants from the rural areas of Sindh responded.

3.11 Data Analysis Technique

Data analysis, which is defined as the process of collecting, structuring, and examining data to identify knowledge that can inform decision making in research, is conducted depending on the goal and objectives of the study in question (Ryder et al., 2020). Since data on digital financial literacy, access to digital infrastructure, perceived usefulness and ease of use, and behavioural intention towards use of digital financial services were gathered, it is necessary to examine the interrelationships between them. To analyze the data collected from the survey participants, multiple statistical tools like regression analysis and correlation analysis were used. Therefore, this study sought to explore the relationships between digital financial literacy, access to digital infrastructure, perceived usefulness, perceived ease of use as the independent variables, and the behavioral intention to adopt digital financial services as the dependent variable through statistical analysis using SPSS Software. In an attempt to establish relations between variables and arrive at results about the research question, regression and correlation tests were attempted.

3.12 Research Ethics

According to Snyder (2019, research ethics involve guidelines and procedures for protecting the rights of participants involved in a research since the rights are crucial in establishing the trust and accuracy of the research process. At the beginning of the survey, respondents signed an informed consent form. They received full information on its purpose, procedures, possible consequences, measures to protect participants' identities and the fact that the participants had an open right to leave the study at any time they wanted. The importance of voluntary participation was declared, and each participant agreed to contribute voluntarily. Moreover, participant information was treated with the utmost confidentiality throughout the research duration, with the researcher having access solely to stored and archived data.

Throughout the data collection phase, the privacy of participants was meticulously upheld. The researcher ensured careful handling of both participant responses and any sensitive information provided. The survey was conducted under very good condition that enhanced the participants' comfort and the study's anonymity. Procedures were put in place to ensure that data collected

during the course of the study was secured, and that the researcher was only allowed to access archival data. Any information that could potentially be used to identify participants was removed in order to maintain confidentiality. The research complied with principles of ethical practice in line with the standards of truthfulness, reliability, and credibility. Concerning citations and references, they were properly done to avoid cases of plagiarism and to respect authors' properties rights.

Chapter 4

DATA ANALYSIS AND DISCUSSION

4.0 Introduction

This section provided an overview of the findings pertaining to the study's assumptions and conclusions derived from the survey. The findings are divided into two categories. Initially, we analyzed the demographics before addressing the hypotheses. The main results were drawn from data collected from 250 participants residing in rural areas of Sindh, who completed a modified questionnaire. Statistical tests were subsequently conducted on the collected data using SPSS software.

4.1 Data Analysis

4.1.1 Reliability Analysis

A reliability study measures the accuracy of survey in getting information. In other words, reliability analysis, which may also be referred to as the Cronbach's Alpha test determines the credibility of the survey. The presence of variability in measurements taken again over time indicates that the questionnaire is more credible.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.813	.807	24

The reliability coefficient, also referred to as coefficient of reliability, gives the idea about the interrelationships of the chosen elements. The reliability coefficient closer to 1 point out greater stability and dependability of the measurement. Based on the reliability statistics Cronbach's alpha value of (0. 824) is satisfactory. This rating is an indication of the stability and reliability of the questionnaire in the conduct of the research. With the Cronbach's alpha coefficient of (0. 824) that is close to 1, it proves both the reliability of the used questionnaire, and the reliability

of the responses given. Numbers above (0. 7) suggest that variable values are within the realm of reliability.

Reliability Statistics		
Variables	**Cronbach's Alpha**	**N of Items**
Digital Financial Literacy	.850	6
Access to Digital Infrastructure	.823	6
Perceived Utility and Ease of Use	.788	6
Behavioral Intention to Use Digital Financial Services	.821	6

Cronbach's alpha for digital financial literacy, access to digital infrastructure, perceived utility and ease of use, and behavioral intention of using Digital Financial Services range from 0. 7 and 0. 9 proving that the gathered data is trustworthy. Therefore, it can be stated that the investigated data complies with the requirements for its reliability assessment.

4.1.2 Descriptive Frequencies

In order to analyse the data, the researcher categorised the information obtained in various subgroups. The sample group comprises individuals characterized by attributes such as education level, age, income, and gender. The respondents of the survey were selected based on the demographics meeting the defined criteria

Descriptive Frequencies

Demographics		Frequency	Percentage
Gender:	Male	165	66
	Female	85	34
	Total	250	100
Age:	30 – 35 years	113	45.2
	36 – 40 years	71	28.4
	41 – 45 years	66	26.4
	Total	250	100
Education:	Undergraduate	61	24.4
	Graduate	93	37.2
	Postgraduate	96	38.4
	Total	250	100
Income:	Less than 500,000	95	38
	500,000 – 1,000,000	84	33.6
	More than 1,000,000	71	28.4
	Total	250	100

In regard to the gender distribution the survey showed that 250 respondents, 66 percent of them were males. On the other hand ; 34 per cent of the respondents were females.

With regards to the age distribution, 113 respondents fell between the ages of 30 and 35 and their percentage is 45.2%. Similarly, 71 respondents fell between the ages of 36 and 40 and their percentage is 28.4% Furthermore, 66 respondents were in the age range of 41-45 years and their percentage is 26.4%

With respect to education level, Postgraduate respondents are 38.4% (96 respondents) of the sample size. Graduates comprised of 37.2% (93 respondents) while those with undergraduate level consist of 24.4% (61 respondents).

Therefore with regard to income the half of participants around (38%) (95 individuals) said they earned less than 500000. Another group of which is one third or in other word around (33. 6%) which is 84 individuals, they indicated that their earnings are between 500, 000 and 1,000, 000. The rest, that is roughly (28.4 percent), said they were earning above 1,000,000.

4.1.3 Correlation Analysis

Instead, correlation analysis is a technique that focuses on relationships between different variables. These relations are measured by using a correlation coefficient which vary between -1 and 1. While a score of "0" means no association between the two variables, "1" represents a positive correlation. The current research uses the Pearson Correlation Coefficient in testing the relationship between the variables.

Correlations

		Digital Financial Literacy	Access to Digital Infrastructure	Perceived Utility and Ease of Use	Behavioral Intention to Use Digital Financial Services
Digital Financial Literacy	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	250			

Access to Digital Infrastructure	Pearson Correlation	.471**	1		
	Sig. (2-tailed)	.000			
	N	250	250		
Perceived Utility and Ease of Use	Pearson Correlation	.459**	.517**	1	
	Sig. (2-tailed)	.000	.000		
	N	250	250	250	
Behavioral Intention to Use Digital Financial Services	Pearson Correlation	.461**	.454**	.501*	1
	Sig. (2-tailed)	.000	.000	.000	
	N	250	250	250	250
**. Correlation is significant at the 0.01 level (2-tailed).					

The table above indicates a significant connection at the 0.01 level between digital financial literacy, access to digital infrastructure, perceived utility and ease of use, and the behavioral intention to use digital financial services. A correlation coefficient of 0.461** suggests a positive relationship between digital financial literacy and the behavioral intention to use digital financial services. Additionally, the relationship between access to digital infrastructure and behavioral intention to use digital financial services at the 0.01 level is supported by a correlation coefficient of 0.454**, indicating a positive link. Furthermore, the findings reveal an association between perceived utility and ease of use and the behavioral intention to use digital financial services with a correlation coefficient of 0.501** and significance level is 0.01.

4.1.4 Regression Analysis

In data analysis, the regression analysis is used to test the null hypothesis that is whether the dependent variables have an inverse relationship irrespective of their roles. For the variables in this study, the approach that was used was the linear regression analysis.

Model Summary			
Model	R	R Square	Adjusted R Square
1	.651[a]	.522	.501
a. Predictors: (Constant), Digital Financial Literacy, Access to Digital Infrastructure, Perceived Utility and Ease of Use			

The R value, therefore denotes the Checklist of digital financial literacy, digital infrastructure, perceived usefulness/usability and behavioral intention to adopt Digital Financial Services. Since, the R value obtained is 0. 651, %=65. 1%; a correlation exists among these variables. Similarly, the R square value assists in determining the impact of digital financial literacy, access to digital infrastructure, and perceived utility and ease of use on the behavioral intentions to use digital financial services. In this study the calculated R squared is (0.522) (52. 2%) meaning the impact is considerable. Also, the Adjusted R squared assesses the goodness of fit of the model, and in this study, the model gave a good fit of 50. 1%

ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1347.637	3	449.212	87.977	.000[b]
	Residual	1256.133	246	5.106		
	Total	2603.770	249			
a. Independent Variable: Digital Financial Literacy, Access to Digital Infrastructure, Perceived Utility and Ease of Use						

b. Predictors: (Constant), Behavioral Intention to Use Digital Financial Services

The significance level of this model is 0.000, indicating high importance, as it falls below the conventional threshold of 0.05.

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.373	.636		3.729	.000
	Digital Financial Literacy	.306	.060	.328	5.107	.000
	Access to Digital Infrastructure	.346	.067	.367	5.107	.000
	Perceived Utility and Ease of Use	.323	.060	.341	5.107	.000
Dependent Variable: Behavioral Intention to Use Digital Financial Services						

Digital financial literacy contributes to influencing the behavioral intention to adopt digital financial services, explaining 30.6% of their intentions of adopting digital financial services. With a beta value of 0.328, there exists a correlation between efforts in digital financial literacy and the behavioral intention to use digital financial services, resulting in an increase in their behavioral intention by 0.328 units for every one unit increase in digital financial literacy. Similarly, access to digital infrastructure influences the behavioral intention to use digital financial services, accounting for 34.6% of their intentions to use digital financial services. With a beta value of 0.367, there is a correlation between access to digital infrastructure and the behavioral intention to use digital financial services, leading to an increase in their behavioral intention by 0.367 units for every one unit increase in access to digital infrastructure. Furthermore, perceived utility and ease of use affect the behavioral intention to use digital financial services, explaining 33.3% of their intentions to use digital financial services. With a beta value of 0.341, there is a correlation between

perceived utility and ease of use and the behavioral intention to use digital financial services, resulting in a growth in their behavioral intention for every one unit increase in perceived utility and ease of use by 0.328 units. These relationships are significant at a probability level of 0. 000, which means that the model captures all these dynamics.

Summary of Data Findings

Hypothesis	Statement	Accepted/Rejected
H1	Increased levels of digital financial literacy among rural inhabitants in Sindh positively correlate with higher behavioral intention to adopt digital financial services.	Accepted
H2	Enhanced access to digital infrastructure directly influences greater behavioral intention to use digital financial services in rural areas of Sindh.	Accepted
H3	Improved perceived utility and ease of use of digital financial services directly lead to stronger behavioral intention to use these services among rural populations in Sindh.	Accepted

Chapter 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study delved into the complex dynamics of digital financial literacy and its impact on the likelihood of using digital financial services in rural Sindh. Through correlation and regression analyses, the relationships between digital financial literacy, access to digital infrastructure, perceived usefulness and simplicity, and behavioral intention were meticulously explored. The findings shed light on the crucial role of digital banking literacy, access to digital infrastructure, and perceived utility and ease of use in shaping behavioral intentions among rural inhabitants in Sindh. Digital financial literacy emerged as a significant determinant of the behavioral intention to use online banking services. The positive correlation between E-finance literacy efforts and behavioral intention underscored the importance of education and awareness initiatives in promoting the adoption of digital financial services. As digital financial literacy increased, so did the propensity to engage with digital financial platforms, emphasizing on the need for targeted educational programs tailored to the specific needs of rural communities.

Access to digital infrastructure also emerged as a key factor influencing behavioral intentions. The strong positive correlation between access to digital infrastructure and the intention to engage with digital financial services highlighted the pivotal role of infrastructure development in fostering financial inclusion. Internet connectivity and mobile networks are the ways through which digital financial services can be made more accessible and convenient in rural areas hence increasing financial inclusion and economic relevancy of the rural folk.. Moreover, perceived usefulness and usability were identified as critical determinants of behavioral intentions towards digital financial services. The positive association between utility perception and ease of use and behavioral intention underscored the importance of user-centric design and seamless user experiences in driving adoption and usage. Simplifying processes, enhancing user interfaces, and offering value-added services can bolster the perceived utility and ease of use of digital financial services, thereby incentivizing adoption and usage among rural populations.

The outcomes of this research have several insights for policymakers, financial institutions, and development practitioners aiming to promote financial inclusion in rural areas of Sindh. Firstly,

efforts should be made to enhance digital financial literacy through targeted education and awareness campaigns, leveraging both traditional and digital channels to reach rural communities effectively. Secondly, investments in digital infrastructure should be prioritized to improve connectivity and expand access to digital financial services in remote areas. Lastly, financial service providers should focus on enhancing the usability and perceived utility of their digital platforms to cater to the diverse needs and preferences of rural users. In conclusion, the study provides valuable insights into the determinants of behavioral intention to use digital financial services in rural Sindh, highlighting the association between digital financial literacy, access to digital infrastructure, perceived utility, and ease of use. By addressing these factors, stakeholders can accelerate the adoption of digital financial services, foster financial inclusion, and unlock new opportunities for economic development in rural communities.

5.2 Research Implications

The practical implications of this research are significant for policymakers, financial institutions, and development practitioners seeking to advertise digital financial awareness in rural Sindh. Firstly, the findings highlight the significance of targeted educational interventions aimed at enhancing digital literacy among rural populations. Practical initiatives such as community-based training programs, mobile learning platforms, and awareness campaigns can be implemented to improve digital literacy levels and empower individuals to engage with digital financial services confidently.

Secondly, the study goes further to recommend the firms to invest in digital infrastructure so as to increase the uptake of digital financial services in the rural regions. Practical measures such as the expansion of mobile network coverage, the deployment of affordable internet services, and the establishment of digital service centers can help bridge the digital divide and ensure equitable access to financial services for rural residents. Additionally, financial institutions can collaborate with telecommunications companies and government agencies to leverage existing infrastructure and reach underserved rural markets effectively. Furthermore, the research emphasizes on the importance of user-centric design and user experience in driving adoption and usage of digital financial services. Practical strategies such as the development of intuitive mobile applications, simplified account registration processes, and personalized financial education resources can enhance the usability and perceived utility of digital financial services among rural users. By

prioritizing user experience and accessibility, financial institutions can overcome adoption barriers and encourage widespread usage of digital financial services in rural communities.

5.2.2 Policy Implications

The policy implications of this research are pertinent for policymakers at the national, regional, and local levels seeking to promote digital financial inclusion and economic development in rural Sindh. Firstly, policymakers should prioritize the development and implementation of comprehensive digital financial inclusion strategies that address the multifaceted challenges faced by rural populations. Practical policy interventions such as regulatory reforms, financial incentives, and public-private partnerships can create an enabling environment for the expansion of digital financial services in rural areas. Secondly, policymakers should focus on enhancing digital infrastructure and connectivity to improve access to digital financial services in remote and underserved regions. Policy measures such as infrastructure investments, spectrum allocation, and regulatory incentives can incentivize telecommunications companies to expand network coverage and deploy affordable internet services in rural areas. Additionally, policymakers can explore innovative solutions such as satellite internet and mobile banking vans to reach isolated communities and provide essential financial services.

5.3 Research Limitations

Despite the valuable insights this study provide, several limitations must be acknowledged to fully understand its scope and implications.

Sample Size: One of the primary limitations of this research is the relatively small sample size. Although efforts were made to collect data from 250 participants, a larger and more diverse sample could have provided a more comprehensive understanding of digital financial behavior in rural Sindh. A larger sample size would have allowed for greater generalizability of the findings to the broader population.

Sampling Bias: The study's reliance on convenience sampling may have introduced sampling bias into the research findings. Participants were recruited from specific rural areas in Sindh, which may not be representative of the entire rural population. Future studies should employ more rigorous sampling techniques to ensure a more representative sample and mitigate potential biases.

Self-Reported Data: Another limitation of the study is its reliance on self-reported data obtained through questionnaires. Self-reported data are subject to recall bias and social desirability bias, potentially leading to inaccuracies in participants' responses. Future research could complement self-reported data with objective measures or observational methods to enhance the validity of the findings.

Cross-Sectional Design: The cross-sectional design of the study limits its ability to establish causal relationships between variables. While correlation analyses provide insights into associations between variables, they cannot determine causality. Longitudinal studies tracking changes in digital financial behavior over time would provide more robust evidence of causal relationships.

Measurement Validity: The study's reliance on survey instruments to measure digital financial literacy, access to digital infrastructure, perceived utility, ease of use, and behavioral intention may have introduced measurement error or construct validity concerns. Future research should employ validated measurement tools to ensure the reliability and validity of the study's measures.

Contextual Factors: The study did not account for contextual factors such as cultural norms, socioeconomic conditions, and institutional barriers that may influence digital financial behavior in rural Sindh. Accounting for these contextual factors could provide a more nuanced understanding of the challenges and opportunities for digital financial inclusion in the region.

Generalizability: Finally, the study's findings may have limited generalizability beyond the specific context of rural Sindh. Factors such as geographic location, cultural diversity, and economic development levels may affect the applicability of the findings to other rural regions or countries. Replication studies in diverse contexts would help validate the robustness and generalizability of the research findings.

5.4 Recommendations and Future Research

Building upon the insights gained from this study and addressing its limitations, several recommendations can guide future research endeavors in the realm of digital financial inclusion in rural Sindh.

Expanded Sample Size and Diverse Sampling: Future research should aim to recruit a larger and more diverse sample to enhance the generalizability of findings. Employing probability sampling techniques, such as stratified sampling or cluster sampling, can help ensure a representative sample of rural residents in Sindh. Additionally, efforts should be made to include participants from various socioeconomic backgrounds and geographic locations to capture the diversity of experiences and perspectives.

Longitudinal Studies: To establish causal relationships and track changes in digital financial behavior over time, future research should adopt longitudinal study designs. Longitudinal studies would enable researchers to examine the dynamics of digital financial inclusion, identify trends, and assess the long-term impact of interventions aimed at promoting financial literacy and access to digital services in rural areas.

Mixed-Methods Approach: Combining quantitative surveys with qualitative methods, such as interviews or focus groups, can provide a more comprehensive understanding of the factors influencing digital financial behavior in rural Sindh. Qualitative methods can help uncover nuanced insights, contextual factors, and lived experiences that may not be captured through quantitative surveys alone.

Validation of Measurement Tools: Researchers should validate measurement tools used to assess digital financial literacy, access to digital infrastructure, perceived utility, ease of use, and behavioral intention. Validated instruments would enhance the reliability and validity of study findings, ensuring that data accurately reflect participants' experiences and perceptions.

Contextual Analysis: Future research should incorporate contextual analysis to explore the influence of cultural norms, socioeconomic conditions, and institutional factors on digital financial inclusion in rural Sindh. Understanding the contextual factors shaping digital financial behavior is crucial for designing effective interventions and policies tailored to the needs of local communities.

Partnerships and Stakeholder Engagement: Collaborating with local organizations, government agencies, and financial institutions is essential for conducting research and implementing interventions in rural areas. Engaging stakeholders in the research process can

facilitate data collection, promote community participation, and ensure the relevance and sustainability of interventions aimed at promoting digital financial inclusion.

Replication Studies: Conducting replication studies in different geographic contexts and cultural settings can validate the robustness and generalizability of research findings. Replication studies would help confirm the consistency of relationships between variables and identify contextual factors influencing digital financial inclusion across diverse populations.

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APPENDIX

Research Questionnaire

Hi. I am a student of Bahria University, Islamabad. I am collecting information for my research thesis, for which I have designed a questionnaire and sharing it with you to gather information. This questionnaire has been designed for the sole purpose of collecting data regarding 'Impact of Digital Financial Literacy on Behavioral Intention to Use Digital Financial Services in Rural Sindh". The data collected will be treated with very high degree confidentiality and it is meant for academic purpose only. You are kindly asked to fill out this questionnaire by circling appropriate answers.

Section A: General Information

Gender:

- Male
- Female

Age:

- 30 – 35 years
- 36 – 40 years
- 41 – 45 years

Education:

- Undergraduate
- Graduate
- Postgraduate

Income:

- Less than 500,000
- 500,000 – 1,000,000

- More than 1,000,000

Section B: Independent Variables

Based on your experience please indicate your level of agreement or disagreement with each of these statements by ticking the appropriate option.

Digital Financial Literacy	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am knowledgeable about the benefits of using digital financial services.	1	2	3	4	5
I feel comfortable performing financial transactions online without assistance.	1	2	3	4	5
I can easily navigate and use mobile banking apps.	1	2	3	4	5
I am aware of the security measures needed to safely use digital financial services.	1	2	3	4	5
I understand the basic concepts of online banking and digital payments.	1	2	3	4	5
I am confident in my ability to use digital financial services.	1	2	3	4	5

Access to Digital Infrastructure	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The digital infrastructure in my area is improving and becoming more accessible.	1	2	3	4	5
I can easily access technical support if I encounter problems using digital financial services.	1	2	3	4	5
There are sufficient local facilities (e.g., internet cafes) that provide access to digital services.	1	2	3	4	5
Internet connectivity is affordable for me.	1	2	3	4	5
I own a smartphone or device capable of using digital financial services.	1	2	3	4	5
I have reliable access to the internet in my area.	1	2	3	4	5

Perceived Utility and Ease of Use	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Using digital financial services is more convenient than traditional methods.	1	2	3	4	5
Digital financial services save me time in managing my finances.	1	2	3	4	5
I find digital financial services easy to use and understand.	1	2	3	4	5
Digital financial services provide me with useful features that meet my needs.	1	2	3	4	5
I believe that using digital financial services can enhance my financial management.	1	2	3	4	5
Learning to use digital financial services is straightforward and does not require much effort.	1	2	3	4	5

Section C: Dependent Variable

Based on your experience please indicate your level of agreement or disagreement with each of these statements by ticking the appropriate option.

Behavioral Intention to Use Digital Financial Services	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

I intend to use digital financial services regularly in the future.	1	2	3	4	5
I am willing to recommend digital financial services to others.	1	2	3	4	5
I prefer using digital financial services over traditional banking methods.	1	2	3	4	5
I plan to use digital financial services for my financial transactions whenever possible.	1	2	3	4	5
I feel motivated to learn more about digital financial services to use them more effectively.	1	2	3	4	5
I am likely to explore and adopt new digital financial services as they become available.	1	2	3	4	5

Thank You!