

Financial Inclusion: A Study on Determinants of Adoption of Digital Financial Services

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by

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CERTIFICATE

This is to certify that the thesis entitled “**Financial Inclusion: A Study on Determinants of Adoption of Digital Financial Services**” submitted by **GOSALA RAJU** bearing registration number **15MBPH15** in partial fulfilment of the requirements for the award of Doctor of Philosophy in the School of Management Studies is a bonafide work carried out by him under my supervision and guidance.

This thesis is free from Plagiarism and has not been submitted previously in part or in full to this or any other University or Institution for award of any degree or diploma.

Further, the student has the following publications before submission of the thesis for adjudication and has produced evidence for the same in the reprint and certificates in the relevant area of his research.

1. Journal of Algebraic Statistics (e-ISSN Number: 1309-3452).
2. AIMS Journal of Management (e-ISSN Number: 1528-2678).
3. Journal of Management & Entrepreneurship (e-ISSN Number: 2229-5348)

and

has made presentations at the following conferences:

1. Advances in Business, Management & Technology (NCABMT-2021) - National conference.
2. Sustainable Indian Economic Development in the COVID-19 Inflicted World Economic Scenario - International conference.

Further, the student has passed the following courses towards fulfilment of coursework requirement for Ph.D.:

Course Code	Name	Credits	Pass/Fail
1. MB – 406	Quantitative Methods	3	Pass
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3. EG – 829	Academic Writing	3	Pass
4. MB – 563	Project Management	3	Pass

Supervisor

Dean

DECLARATION

I, **Gosala Raju**, hereby declare that the thesis entitled “**Financial Inclusion: A study on Determinants of Adoption of Digital Financial Services**” submitted by me under the supervision of Dr. Irala Lokanandha Reddy is a bonafide research work for the award of a Doctor of Philosophy degree in School of Management Studies, University of Hyderabad. I also declare that this work is original and free from plagiarism and has not been submitted in part or full for the award of any degree or diploma to this University or any other university or Institution.

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STATEMENT OF GRATITUDE

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ACRONYMS AND ABBREVIATIONS

AD	Adoption
ATM	Automated Teller Machine
AVE	Average Variance Extracted
CGAP	Consultive Group to Assist the Poor
CMB	Common Method Bias
DBT	Direct Benefit Transfer
DFI	Digital Financial Inclusion
DFS	Digital Financial Services
DOI	Diffusion of Innovation
DTPB	Decomposed Theory of Planned Behavior
EFA	Exploratory Factor Analysis
EU	Ease of Use
GDP	Gross Domestic Product
GoI	Government of India
HTMT	Heterotrait-Monotrait Ratio
ICT	Information Communication Technology
IS	Information Systems
IT	Information Technology
JAM	A trinity of Jan-Dhan Yojana, AADHAAR, and Mobile Phone
NPCI	National Payments Corporation of India
PLS-SEM	Partial Least Square Structural Equation Modeling
PMJDY	Prime Minister Jan-Dhan Yojana
POS	Point of Sale
PR	Perceived Risk
RA	Relative Advantage
RBI	Reserve Bank of India
SDG	Sustainable Development Goals
SE	Self-Efficacy
SEM	Structural Equation Modeling
SN	Subjective Norms
STDEV	Standard Deviation

TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasonable Action
TRAI	Telecom Regulatory Authority of India
UIDAI	Unique Identification Authority of India
UN	United Nations
UPI	Unified Payments Interface
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Influence Factor

Notations

%	Percentage
H	Hypothesis
α	Cronbach's Alpha
β	Standardized Beta Coefficient
P-Value	Probability value of significant level
T-Value	t-statistic
F^2	Effect Size
Q^2	Predictive Relevance
R^2	Coefficient of Determination

Abstract

Globally, most people do not have access to financial services, especially in developing countries. Governments, banks, and financial institutions focus on providing financial services for unserved and underserved populations. The traditional form of financial services spread was uneven across the territories and rural areas were ignored due to unprofitable. Hence, technology would help to overcome some of the barriers to financial inclusion. Digital financial services like – internet banking, mobile banking, and digital payments enable rural people to access and use different financial services. Despite of benefits provided by digital financial services, their use was very low and slow in India, especially in rural areas. Therefore, this study attempts to investigate the key determinants of the adoption and continuous use of digital financial services in rural areas with a self-designed research model. To achieve the objectives of the study 665 samples were recruited from different rural parts of Andhra Pradesh. PLS-SEM was employed for the data analysis. The results identified that subjective norms, ease of use, relative advantage, self-efficacy, and perceived risk were significant factors in the adoption of digital financial services. Digital financial inclusion was determined by the adoption of digital financial services, subjective norms, ease of use, and relative advantage. Hence, the empirical results of the study emphasized that the adoption of digital financial services had significantly accelerated the financial inclusion and use of financial services very frequently to meet financial obligations.

CHAPTER – 1

INTRODUCTION

1.1 Introduction

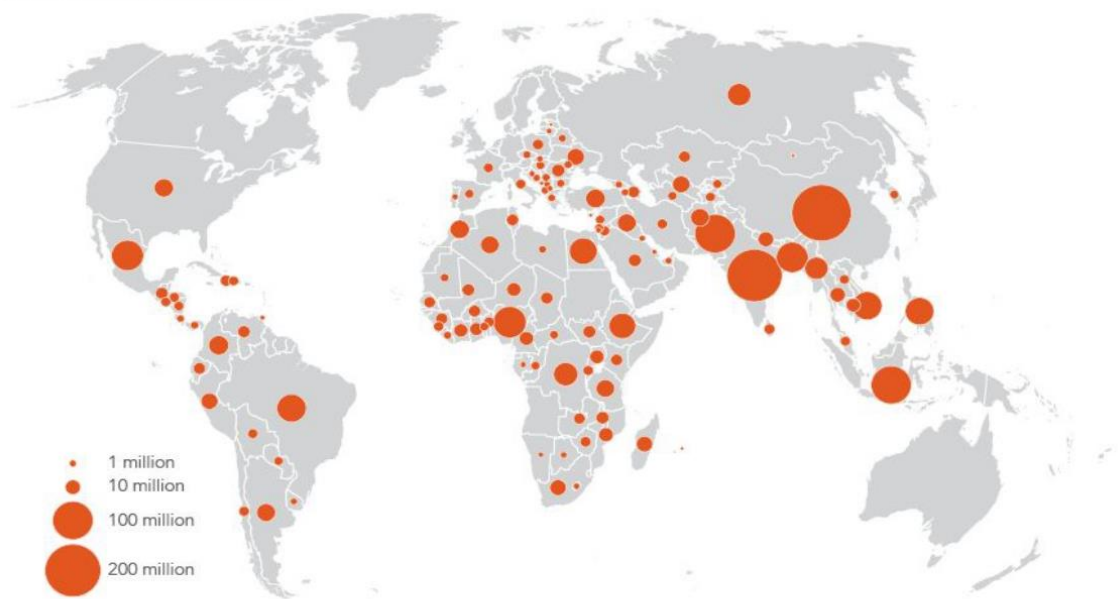
Globally, the term "financial inclusion" being a buzzword for a couple of decades. It occupied prominence in policy making, particularly in emerging economies, where many people are reported to be unbanked and financially vulnerable. Financial inclusion aims to provide different financial products at a low price to all societal groups without discrimination, especially focusing on the unbanked and underbanked. Equal allocation and availability of finance to all have been recognized as a vital aspect of inclusive growth, poverty reduction, improved quality of life, enhanced savings & investments, creation of employment, and overall development of the economy. Therefore, an inclusive financial system ensures the equal availability, accessibility, and usability of financial services by all sections of society.

In an economy, financial services are said to be the key drivers of economic growth, minimizing regional imbalances, and poverty reduction (Bansal, 2014). Financial services enable households and businesses to save, invest, and protect from risk (Nikolov, 2017). Generally, an account at a bank is fundamental to avail of saving deposits, loans, investments, payments, remittances, and insurance products. But the availability, accessibility, and usage of these services vary throughout the world, and regions within the nations. The World Bank's Findex Database (2017) reported that globally 1.7 billion people had no accounts with any banks or post offices., which represented 31 percent of the global population, India alone accounts for around 11 percent (191.3 million) of the global unbanked population. The majority of the

unbanked population is from low and middle-income countries and too from rural areas. The existing literature identified many reasons for financial exclusion. Low income, unemployment, low education, financial illiteracy, the geographical distance of financial institutions, unsuitable financial services, the cost associated with accessibility and usage of financial services, lengthy documentation process, lack of faith, limited financial resources, and poverty are few of the obstacles for financial exclusion.

Figure 1.1: Unbanked Adults

Globally, 1.7 billion adults lack an account
Adults without an account, 2017



Source: Global Findex database.

Note: Data are not displayed for economies where the share of adults without an account is 5 percent or less.

The inclusion of vulnerable populations into the financial system improves financial stability and sustainable development. Therefore, assuring appropriate suitable financial services for vulnerable people at lower prices is now a policy priority for the majority of governments, banks, financial institutions, and international organizations in order to achieve sustainable inclusive growth and the eradication of poverty. Hence,

there is an emerging need to identify suitable and viable business models and strategies to offer and deliver financial products for the welfare of vulnerable people, particularly in rural and remote areas, to reach the last milestone of financial inclusion.

The traditional financial service, that is offered at branch offices is not considered viable in rural and tribal areas due to the huge cost and capital involvement to establish and operate a branch and the low or no profitability of these branches. Traditional financial services, such as branch banking, were reported to have not changed the customers' behavior towards accessibility and usage of them. Traditional financial services are very expensive and require a series of documentation, and travel distances to avail them. Therefore, rural and low-income people are discouraged from using formal financial services. There is a need to identify alternative avenues and platforms to cater to the excluded people from the financial system.

Rapid advancements in information technology (IT) have transformed the business models and behavior of people. Initially, firms have adopted IT for internal business operations as the effective allocation and use of resources, to enhance managerial efficiency, and productivity. Presently paradigm shift is the adoption of IT not only for internal business and also for customer services. Therefore, firms have recognized IT as a competitive strategy for sustainable development. Particularly, the services sector has leveraged IT at a high level for customer reach. In line with other service providers, banks and financial institutions adopted IT for offering financial products through digital means to be competitive in the market and cater better to their existing and potential customers to gain sustainable prosperity of the business.

Digital banking has been recognized as the most convenient and inexpensive way to design and deliver financial products. The adoption of DFS is on surge across economies because of the increased use of personal computers, smartphones, and the internet. Therefore, the design and delivery of financial services through the digital channel have become key drivers to achieving desired financial inclusion. DFS has the potential to be used round the clock and around the globe with the help of internet connection through computers or smartphones at the customers' convenience. In recent times we have been experiencing the active usage of financial services through computers and mobile devices.

1.2 Financial Inclusion

The availability, accessibility, and usage of financial services among stakeholders are uneven across the world, particularly in developing countries. The World Bank's Findex Database (2018) presented that 50 percent of the unbanked population was from seven countries including China, India, Indonesia, Nigeria, Mexico, Pakistan, and Bangladesh. It was recognized that having a basic account at a bank is a gateway for accessing and availing of a wide-ranging variety of financial services. It is generally believed that only those with high incomes can access and utilize financial services on a wider scale. Thus, it is necessary to spread the availability of financial services for all to improve living standards and financial stability. Financial services are the key drivers for the overall development of economies. Therefore, the inclusion of unbanked and underserved communities in the formal financial system is crucial for the nation's inclusive and sustainable growth. Financial inclusion's prime objective is

to encourage and enable all socioeconomic groups, especially those who are financially disadvantaged, to avail suitable financial services.

1.2.1 Definitions of Financial Inclusion

Some of the important definitions of financial inclusion are placed below.

Rangarajan Committee (RBI, 2008) defined *“financial inclusion as the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low-income groups at an affordable cost”*.

Deepak Mohanty Committee (RBI, 2015) stipulated *“financial inclusion as convenient access to a basket of basic formal financial products and services that should include savings, remittance, credit, government-supported insurance, and pension products to small and marginal farmers and low-income households at a reasonable cost with adequate protection progressively supplemented by social cash transfers, besides increasing the access of small and marginal enterprises to formal finance with a greater reliance on technology to cut costs and improve service delivery”*

United Nations (2010) stipulated *“financial inclusion as providing affordable and useful access to financial products and services to all individuals and businesses worldwide”*.

Consultative Group to Assist the Poor (2011) defined *“financial inclusion as formal financial services - such as deposit and savings accounts, payment services, loans, and*

insurance - are readily available to consumers and that they are actively and effectively using these services to meet their specific needs”.

World Bank, (2022) stipulated *“financial inclusion as individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit, and insurance delivered in a responsible and sustainable way”.*

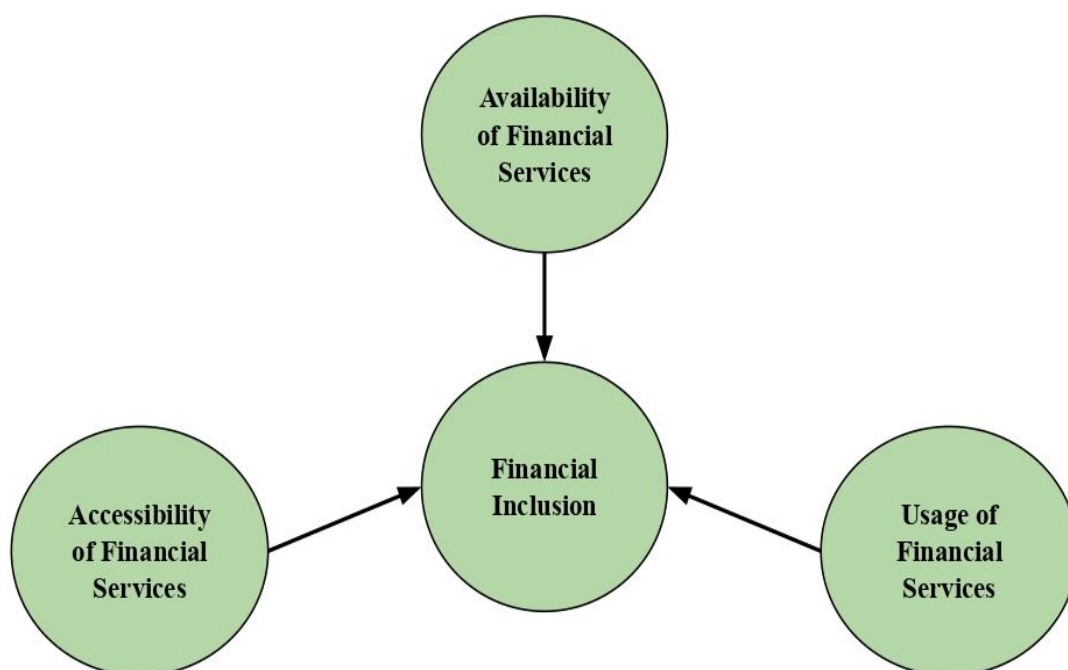
Aisaiti et al., (2019) noted *“financial inclusion as a strategic business model that allows financial institutions to offer wide range of financial products to all, without ignoring poor, particularly focusing on rural people”.*

The above definitions specifying about the accessibility of financial services. Financial inclusion, however, is not impacted by only having access to financial services. Centre for Financial Inclusion noted precisely *“financial inclusion as a state in which everyone who can use them has access to a full suite of quality financial services, provided at affordable prices, in a convenient manner, with respect and dignity”* (Arun & Kamath, 2015). Therefore, it can be determined that the process is ensured with not only accessibility but also the usage of financial products at a reasonable price by all stakeholders of society, without any privileges. Simply having accessibility to and availability of financial services is not financial inclusion (Klapper & Miller, 2021), but financial inclusion is all about the actual use of savings accounts, term deposits, borrowings, payments, remittances, and insurance. Yet, many rural people just had an account i.e. saving account at either a bank or post office, but not insurance and other investment services.

1.2.2 Components of Financial Inclusion

Financial inclusion is a comprehensive and multi-dimensional term that can be understood with three important components, namely - availability, accessibility, and usage of financial services.

Figure 1.2: Key Components of Financial Inclusion



Source: Literature Review

1. **The availability of financial services** refers to the variety of financial products readily available in the market for customers to meet their immediate needs. Therefore, the availability of different financial products has a significant impact on financial inclusion. It emphasizes the need for the design and development of different financial services for the customers according to their needs and competency to pay for them, that in turn affects the usage of financial products.

The availability of suitable financial products will enhance the active and frequent use of financial services. Therefore, it is essential to ensure the availability of suitable financial services for the financially excluded or/and underserved population to streamline them into the formal financial system.

2. The accessibility of financial products denotes to that an individual's capability to access financial products which are available in the market through different channels. The concept of accessibility focuses on how easily customers avail and obtain products from the marketplace. The accessibility of financial products depends on the mechanism adopted by the financial institutions to offer the product to a largely different set of customers. Hence, the accessibility of financial products emphasizes the easier and more convenient way to get financial products, which enables all of us to use them frequently.

3. Finally, the usage of financial products is the ultimate goal of financial inclusion. Financial inclusion does not denote to seldom usage of financial services. The objective of financial inclusion is for financially vulnerable individuals to regularly use a range of financial services, including deposits, loans, payment, risk-mitigating, and other financial consultancy services. Hence, the actual usage of financial services enhances the free flow of funds across all segments which affects productivity, employment, consumption, consumption of quality products, education, living standards, and the development of the economy.

1.3 Importance of financial inclusion

Seven of the seventeen Sustainable Development Goals of the United Nations for 2030 can be achieved with the help of the financial inclusion (Cavoli & Shrestha, 2020). Globally, governments, central banks, international organizations, and researchers have viewed financial inclusion as the main force behind financial progress and economic development. Adegbite & Machethe, (2020) stressed that bringing unbanked and underbanked people and businesses into the financial system improves stakeholder socioeconomic prosperity and sustainable inclusive growth. Financial inclusion drives the increased usage of deposits, loans, investments, payments, remittances, and risk-mitigating products. The increased financial inclusion has substantial optimistic results in the quality of livelihood, financial vulnerability reduction, gender discrimination, and employability (RBI, 2020). Globally, financial inclusion is recognized as an essential element for achieving the *social and economic objectives* of governments.

1.3.1 Social Objectives

Facilitating access to and sufficient usage of saving and investment financial products accelerate wealth creation and maximization, enhances consumption of quality products to lead a healthy life, and improves the education levels and development of human capital. Credit facility enhances potential investments and productivity, meet immediate financial emergencies, reduce financial risk, and avoid the financial burdens arising from the subscription to informal finance. Insurance products provide protection and security from financial risk which arises from happening of uncertain events.

1.3.2 Economic Objectives

providing access and motivating to use formal financial services would improve financial stability and economic development. For instance, saving accounts and term deposits pool the savings of poor people and render the same for needy people for penitential investments. Investments in economic activities have an impact on the creation of employment and production levels. The employment of the people assures stable income and improves the consumption of power, which has an overall effect on GDP.

Therefore, all the developing countries have been setting financial inclusion policies and strategies to achieve sustainable development goals and inclusive financial systems. India also framed a national-level financial inclusion strategy to provide universal access to suitable financial services with help of innovative technologies by providing financial literacy to enhance the financial well-being of the poor.

1.4 Barriers to Financial Inclusion

Numerous researchers, across the world, were identified different barriers to financial inclusion through empirical studies.

- Rural residents must travel a great distance to get formal financial services. In India, rural people have to travel at least 10 KM to avail of formal financial services. The poor rural people must forego their daily wage for availing of formal financial services and traveling expenditure is an additional burden for them. Findex report (2017) portrayed that 22 percent of people stated the distance of the financial institution is the main reason for not using financial services.

- Formal financial services are very expensive for the poor. The subscription to financial services is embedded with certain costs like annual fees, transaction costs, and minimum balances. According to the Findex report, the cost of financial services is the second most reason for not using financial services.
- The availability of pro-poor financial products offered by financial institutions and banks is very limited. The unavailability of suitable and affordable financial products is a contributing factor to financial exclusion. The poor and financially vulnerable people need comparatively little amounts to meet financial obligations. But financial institutions are failed to provide pro-poor financial products.
- Financially excluded people are having low or no faith in banks and financial institutions.
- The availing of financial services is a cumbersome procedure and time taking. Financial institutions must comply with legal proceedings in order to offer financial services. Financial services delivery was delayed as a result of legal and regulatory processes, which also involved protracted documentation processes. Therefore, people resist subscribing to financial services at financial institutions. On the opposite side, people are getting finance from local money lenders effortlessly because they know each other personally not required lengthy documentation.
- Many individuals in underdeveloped nations lack the necessary identity cards to access formal banking services. For banks, identity cards are essential for the catering of financial services that is knowing your customer (KYC).

- Income is another important element for financial inclusion. Most people who are financially excluded claim that not using financial services is because of low or uncertain income.
- The inability of subscribing to and using of financial services from banks is further hampered by a lack of financial literacy. Due to illiteracy, people do not have awareness of the different financial services afforded by banks and financial institutions.

1.5 Role of Technology in Financial Inclusion

The financial services sector has undergone a transformation thanks to information technology (IT), which has also made it possible to design new financial products and specialized services to meet consumer demands. IT has the potential to develop a stable, efficient, and inclusive financial system, which is the need of the day. Advancements in IT like the internet of things, big data analytics, artificial intelligence, machine learning, blockchain technology, etc., are providing a competitive advantage in all aspects of business operations. Further, technology has the potential to reach remote and rural areas where the establishment of a financial institution is unviable, and difficult to run a branch office in those areas. Therefore, technology-based innovative products can competently reach these areas and enhance the accessibility and usability of financial products through digital channels like the internet (world wide web), mobile applications, and ATMs.

Particularly, m-banking has been acting as a key driver of financial inclusion in rural areas by removing physical approaches to a bank or financial institutions for the availing and use of financial products. Dash, (2020) stated that mobile devices became

a strategic tool for the accessibility and usage of different financial products through mobile applications in the comfort of customers at any time of the day from any place.

Mobile phones, particularly smartphones, have become enablers of digital inclusion for a substantial segment of the population that could not otherwise afford desktops or laptops to access internet products and services. According to Deloitte (2017) report, every 9 of 10 people have a mobile phone across the world. TRAI (2022) mobile subscription data reports portray that 1141.53 Million Indians subscribed for the wireless mobile subscription, and around 45.23 percent of subscribers were from rural India. RBI (2021) Annual reports that around 70 percent of the volume of credit transfers have been done using UPI payments Which is a purely mobile phone enabled payment service. Demirgüç-Kunt et al., (2018) stressed that access to a vaster choice of financial products is improved by the use of the internet and mobile devices. Consequently, smartphone-enabled innovative financial products are gaining traction among the people, paving the way for the progression of financial inclusion.

1.6 Digital Financial Inclusion

Developments in computer science, both software and hardware, have altered business and customer interactions. Advancements in computer science have been delivering new customized goods and services to all stakeholders in society, such as personal computers, wireless technologies, smartphones, machine learning, the internet of things, and artificial intelligence are few in the list. These developments have changed the behavior of both real and artificial persons, resulting in a digital world where we can access a large range of information and products at our leisure, at any time, and

from any location. These technologies are connecting people, businesses, and regulatory agencies virtually and provide solutions at the touch of a finger.

As a result of greater access to and use of digital technology establish infrastructures for the creation of innovative products and services. The focus of financial institutions and banks increasingly switched from back-end operations to front-end operations or client service.

Jim Young Kim, former president of the World Bank, observed that the DFI “*involves the deployment of the cost-saving digital means to reach currently financially excluded and underserved populations with a range of formal financial services suited to their needs that are responsibly delivered at a cost affordable to customers and sustainable for providers*”.

Lauer & Lyman (2015) defined DFI in CGAP BRIEF as “*Digital access to and use of formal financial services by excluded and underserved populations. Such services should be suited to the customers’ needs and delivered responsibly, at a cost both affordable to customers and sustainable providers*”.

The term “digital financial inclusion” is the strategic process to assure universal accessibility, availability, and usability of financial services via digital channels to the financially excluded and underserved people.

1.7 Digital Financial Services

DFS denotes “*providing financial services via digital channels by banks and other financial institutions to their customers*”. Which includes savings, term deposits,

credit or loans, insurance, and payments. Digital channels include computers, mobile phones, tablets, ATMs, and POS terminals.

Digital channels can be classified into two. First, digital channel infrastructure is developed by service providers or business units. For instance, ATMs are installed by banks or financial institutions, and POS terminals are provided by Banks and business units. These digital channels have a limitation of physical access, that is customers must travel to access these digital channels.

Second, digital channels support systems developed by customers themselves. For instance, personal computers, mobile phones (Smartphones), and tablets. Customers can use financial services at anytime and anywhere. Among these digital channels mobile phones are more convenient than others because mobile phones are easy to carry, hold, and inexpensive to purchase compared with computers and laptops. Accessing and using financial services through mobile phones is known as mobile banking. In this study, DFS refers to financial services availing, accessing, and using mobile phones. Because mobile phones are highly penetrated among rural populations.

1.8 Key Initiatives for Digital Financial Inclusion in India

The rigorous financial inclusion process can say, started in 2014 onwards in India. GoI and RBI have been taking various policy and regulatory initiatives to realize financial inclusion to the fullest with help of innovative technologies (i.e. advancements in IT). Innovative technologies have changed the landscape of the services sector and helping firms to design and development of new products at low-price and enabling them to customer reach around the clock and around the globe. The use of DFS in emerging

countries, in recent times, enriched exponentially. India has leveraged technology to reach its citizens by providing a variety of social welfare schemes and other commercial services through digital channels. The list below includes a few of the key forces influencing DFI. In India, the rigorous financial inclusion process began in 2014 and has continued since then. With the help of innovative technologies, the GoI and RBI have been taking different initiatives to achieve full financial inclusion.

1.8.1 National Payments Corporation of India

The retail payment and settlement systems in India are governed by the NPCI, an umbrella organization. RBI and Indian Banks' Association (IBA) established NPCI under the Payment and Settlement Systems Act, 2007, for the development of strong payments and settlements Infrastructure in India. Since its establishment, NPCI has prioritized the quick and real-time settlement of financial transactions conducted online. BHIM-UPI, Bharat BillPay, and RuPay cards are some of the most well-known digital payment methods introduced launched by NPCI to speed up and accelerate digital payments (<https://www.npci.org.in>).

1.8.2 AADHAAR

Aadhaar is a 12-digit unique identification number (UID) issued by the GoI to its residents at once in a lifetime. UIDAI is an Aadhaar governing authority established by GoI under the Aadhaar Act, 2016 that regulates and monitors the enrolment, authentication, operation, and management of Aadhaar numbers. Aadhaar contains demographic as well as biometric information of the residents. It supports e-KYC and is one of the basic pillars of turning India into a Digital India. Therefore, Aadhaar is a

strategic plan for India to promote financial and social inclusion. UIDAI issued 131.68 crore Aadhaar numbers to Indian residents (<https://www.uidai.gov.in>).

1.8.3 Direct Benefit Transfer

DBT is a delivery system introduced by the GoI on 1st January 2013 to deposit the government's welfare and subsidized funds directly to the accounts of beneficiaries and provide information to the beneficiaries. DBT is an electronic means of fund transfers from the government to the public. Almost all government welfare and subsidy schemes are delivered through DBT. JAM (Jan Dhan Yojana, AADHAAR, and Mobile) facilitated DBT to achieve the highest degree. DBT mechanism helps the government to remove intermediate agents and fraud beneficiaries and cut down the corruption in the social welfare delivery system. The DBT system helps poor people to improve their financial well-being.

1.8.4 Pradhan Mantri Jan-Dhan Yojana

PMJDY is the National Mission for Financial Inclusion started on August 28, 2014. The prime objective of the program is to open a savings account for unbanked people by providing essential financial services such as deposit accounts, insurance, loan, and pension at low cost. PMJDY accounts provide a variety of benefits like opening an account at a bank or Business Correspondent (Bank Mitra), no condition of maintaining a minimum balance, providing accident insurance worth ₹ 2,00,000, life insurance, and an overdraft facility of ₹ 10,000. Under this scheme 45.72 crore people opened accounts and issued 31.81 crore RuPay cards as of 15th June 2022.

1.8.5 Digital India

Digital India is a prioritizing program of the GoI to empower the Indian population through digital mode. This program has threefold implications namely, the development of digital infrastructure for the utility of citizens, e-governance and e-services, and empowering citizens digitally.

1.8.6 UPI Payments

The Unified Payment Interface (UPI) is a smartphone application designed by the NPCI, an umbrella organization for the settlement of digital payments in India, formally launched in August 2016. Unlike mobile wallets popular around the globe as mobile payments, UPI payments is an integrated mechanism that links multiple bank accounts to a mobile application that allows real-time interbank transfers seamlessly. It offers various banking features, such as balance verification, merchant payments, domestic bill payments, and peer- to-peer remittances instantly through the virtual payment address (which is similar to an email address) or QR code issued by banks or service provider and secured with a UPI-PIN or MPIN consisting of 4 or 6 numerical digits.

These latest digital payments accounted for the rising in value and volume of transactions exponentially. In the month of August 2016 volume of transactions was 0.09 and the value of the transaction was ₹ 3.09 and presently in the month of June 2022 the volume of transactions was 5,862.75 crore and the value of the transaction was ₹ 10,14,384.31 crore. The statistical reports of UPI payments have shown tremendous growth in digital payments through UPI payments across India.

1.8.7 Demonetization

GoI announced the withdrawal of ₹ 500 and ₹ 1000 notes from the tender currency of financial transactions on 8th November 2016. It had created a shortage of circulation of currency and long queues at banks and financial institutions to exchange and replace withdrawn currency notes. During this period many people switched to digital payments through debit cards, mobile wallets, and other alternative means of payment. In India, Demonetization is one of the reasons for the surge of digital transactions and payments.

1.8.8 COVID-19

COVID-19 created a medical emergency around the world and caused the implementation of a lockdown to resist the surge of the COVID-19 virus. This medical emergency kept people staying away from each other to protect themselves from and resist the surge of COVID-19. This medical pandemic reasoned for people to switch digital world. During the lockdown, many people across the globe adopted digital financial services to meet financial obligations including rural people.

1.9 Digital Financial Inclusion in India

PMJDY is the mission program of GoI has led the mass opening of saving bank accounts. The progress report of the PMJDY portrays that almost all households had bank accounts. But the big question is that are these accounts are using actively. The World Bank's Findex Database (2017) presented that 48 percent of the households that had bank accounts are not using them. It is showing that half of the account holders not using them. PMJDY succeeded in opening accounts for its all households. Financial inclusion does not, however, depend solely on holding a bank account.

Financial inclusion is a blend of accessibility, availability, and usage of financial products at a reasonable price to meet the needs and emergencies of all sections of society, especially the poor and vulnerable people.

Inactive use of accounts, particularly in rural and remote areas, maybe because of the location of the banks. For banking services, people in rural areas must travel vast distances. Further, these rural people have to forgo their daily wage to avail of financial services. Therefore, instead of using formal financial services, they opt for informal financial services like taking loans from local money lenders or giving their savings as loans to their known people rather than a formal financial investment.

Financial technology, or the digitalization of financial services, has the potential to address numerous issues with the usage and accessibility of financial services. Through digital means, financial services are available to everyone 24 hours a day, all around the world. NPCI (2020), reported that almost 68 percent of Indian households had a smartphone, which was also reported (66 percent) by the Findex report (2017). Through smartphones, we can use many digital services like online shopping, gaming, entertainment, paying bills, booking tickets, accessing financial accounts, etc. The huge penetration of smartphones in the Indian market can be seen as an opportunity for the spreading of financial inclusion.

DFS are cost-effective for both customers as well as service providers. Almost every bank digitalized their services (internet banking, mobile banking, and mobile payment) in recent times to engage customers and to fulfil the requirements of current and potential customers. But the use of digital financial services by Indian households is very low. The latest reports about the usage of DFS by Indian households is showing

a very low rate of adoption and usage. For instance, NPCI (2020) reported that 32 percent of Indian households use digital payment, 34 percent of Indian households have mobile bank applications, and only 14 percent of Indian households use mobile phones for banking activities. Therefore, this study tried to investigate the motivating and demotivating factors of DFS adoption and usage to understand DFI in the Indian rural context.

CHAPTER – 2

LITERATURE REVIEW

Outline of the Chapter

The literature review provides a concrete understanding of the research phenomena, the extent of research carried out about the research problem, and the identification of the research gap. This chapter presents extensive research that established the importance of financial inclusion for economic and human prosperity, the factors influencing the adoption and use of DFS, as well as their role in increasing financial inclusion.

2.1 Financial Inclusion for Economic and Human Prosperity.

This section discusses the importance of financial inclusion for both economic and human prosperity. Financial inclusion had a strong positive connection with both human and economic development, according to numerous research studies. A summary of important existing empirical research work that established the substantial effect of financial inclusion on economic and human prosperity has been discussed below.

Khan (2012) studied the multiplier implications of financial inclusion. First, it brings a greater inclusive financial system in the country that leads to the participation of all economic agents in the formal economy. Second, it enables savings from the BoP to participate in the financial system, hence facilitating the expansion of credit and investments for the underprivileged. Last, ensuring accessibility and availability to financial services for the vulnerable improves living standards, creation of financial

assets, and assures from financial shocks. Further, he believed that financial services are the public good that must be available for all agents of the economy.

Kling et al. (2022) stated in their research paper that financial inclusion expands financial services accessibility and minimizes income inequalities by promoting education and entrepreneurship for the poor. Their empirical results endorsed financial inclusion minimizes income inequality in society and enhances human capital development through investing money to impart education and skills that result in making wise and viable investment entrepreneur activities.

Ajefu et al. (2020) studied the impact of financial inclusion on mental health in Nigeria. The results observed that financial inclusion improves financial services accessibility and usages like deposit accounts, loan facilities, and insurance products. The enhanced access and use of financial services reduce mental health issues and improve physical and mental health. This study asserts that using financial services significantly improves the overall well-being of human livelihood.

Le et al. (2019) studied how financial inclusion affected financial sustainability and efficiency in the context of Asian countries. They observed that while financial efficiency was negatively impacted by financial inclusion, financial sustainability was positively impacted in Asia. They claimed that one of the main forces boosting economic growth was financial inclusion. Further, they suggested that a high level of low-income participation built an increase in transactions and social costs due to a lack of credit history causing financial inefficiency.

Vo et al. (2021) studied the effect of financial inclusion on financial stability in the Asian region using a generalized method of movement (GMM) utilizing a dataset of

3071 banks over a ten-year period (from 2008 to 2017). The empirical findings showed that financial inclusion has a major impact on financial stability in the banking industry. They emphasized that through financial inclusion banks are expanding marketing share, and revenue, and can reduce transaction costs. This study emphasizes that financial inclusion enables to pool of savings of poor people and improves the financial well-being of the poor by providing suitable financial services timely.

Van et al. (2019) assessed the nexus between financial inclusion and economic progress at the international level using World Bank's Findex data. They identified a strong correlation between financial inclusion and economic progress. It implies that higher use of financial services improves financial inclusion, and per capita GDP was grown by the enhanced financial inclusion. Therefore, they asserted that financial inclusion enables economic development.

Research carried out by **Adegbite & Machethe (2020)** in Nigeria to understand how financial inclusion reduces the gender gap and the results implied that financial inclusion bridges the gap between males and females. In addition to the gender gap, they observed financial inclusion has improved the financial independence and empowerment of women.

Ajefu et al. (2020) researched using data from Nigerian General Households, it was investigated how financial inclusion affects households' mental health in Nigeria. The authors established mental health of Nigerian households had been positively impacted by financial inclusion. Another study by **Ajide (2020)** enquires about the presence of financial inclusion in curbing corruption in Africa. The results showed that corruption can be controlled through effective financial inclusion.

Datta & Singh (2019) assessed the nexus between financial inclusion and human prosperity using the World Bank data which consists of 102 countries classified into three groups – low-income, middle-income, and high-income. The results observed that financial inclusion has a substantial impact on Human prosperity across different developed and developing countries. The data analysis was done in a two-step approach. First, the number of related factors is reduced by using the principal component analysis. Second, the nexus between financial inclusion and human prosperity was examined by regression analysis. The findings showed that financial inclusion and human prosperity have strongly correlated in all nations. The authors emphasized that the usage of financial services by the vulnerable can reduce the poverty and enhances the opportunities for pursuing education and investment in health. This study navigates that the development of human resources can be possible when increased access to financial services.

Emara & Mohieldin (2020) investigated how poverty reduction was influenced by financial inclusion in the MENA region of South Africa and also a comparative study between MENA and emerging countries. World Bank annual data from 1990 to 2017 was used for examining the relation. The results showed that extreme poverty reduction was positively impacted by financial inclusion. They stated that improved financial services accessibility lowers poverty and aids in the achievement of the SDG by 2030.

Erlando et al. (2020) assessed the relationship among financial inclusion, economic growth, poverty, and inequality using panel data from Eastern Indonesia. Through the use of a bivariate causality model and dynamic panel estimation methods, the relationship between the variables was investigated. The bivariate model's findings

suggested that economic progress, financial inclusion, infrastructure, and education were all closely related to poverty. Infrastructure development, financial inclusion, and economic expansion all have strong ties to inequality. The multivariate estimation model identified economic growth and poverty reduction were strongly affected by financial inclusion. Further, the findings revealed that economic progress has a considerable result on poverty reduction through financial inclusion. As a concluding point, the study of financial inclusion has a substantial impact on economic progress and poverty and a negative impact on inequality.

Goel & Madan (2019) studied financial inclusion's impact on women's entrepreneurship in Uttarakhand (India). The primary data of 250 samples of women entrepreneurs were gathered. The regression analysis found financial inclusion has a strong positive impact on women's entrepreneurship. Providing financial services like deposits and loan facilities can empower women financially and reduces gender discrimination.

Huang et al. (2020) examined the impact of financial inclusion on the economic progress of European Union countries by classifying them into four groups – low-income, high-income, old, and new European Union members. Annual data from 1995 to 2015 was analyzed using the panel unit root technique. The results observed that financial inclusion plays a substantial role in economic progress among all European Union members, but in the new European Union members are high compared with other member countries. They emphasized that financial inclusion policies were important to accelerate economic growth.

Inoue (2018) researched in India to explore the relationship between poverty and financial development using panel data from 1973 to 2004. They conceptualized financial development with a blend of financial inclusion and financial deepening. The use and accessibility of financial services serve as indicators of financial inclusion. Financial deepening was measured with bank credit to GDP. The author classified banks into public sector and private sector banks to investigate how financial inclusion affects the fight against poverty. The empirical findings revealed that public sector banks, as opposed to private sector banks, had a significantly positive impact on poverty reduction. These results showed that the spread of the public sector bank is high, whereas private banks are limited to urban areas. Further, Inoue found that the interaction of financial inclusion and financial deepening are enablers of the eradication of poverty.

Kapoor (2014) explored how financial inclusion impacts both economic and human growth. Financial inclusion enables people to fund economic growth, in turn, they yield benefits in different forms. Like employability, development of infrastructure, financial stability, etc. Kapoor emphasized that financial intermediaries play a pivotal role in bringing poor and rural people into the net of the financial system by providing suitable financial services to them. And he considered financial inclusion as a game changer rather than a welfare measure.

Khaki & Sangmi (2017) assessed the impact of access through financial inclusion programs on multiple dimensions of poverty eradication. Empirically, they observed that the poverty reduction in Kashmir Valli was significantly directly and positively impacted by access to finance. Further, the authors suggested that unrestricted access

finance to for the poor enhances an investment in economic activities, that in turn improves the livelihood of the poor.

Kling et al. (2022) carried out research to describe the role of financial inclusion on income inequality in China, one of the emerging economies, using China Household Finance Survey (CHFS). The authors empirically identified education and financial inclusion have substantially improved the income of the people. In addition to that, they observed that taking loans either formal or informal worsens financial well-being and whereas saving in bank accounts improves financial well-being. Further, they stipulated education improves the income of the people.

Lal (2018) assessed the role of financial inclusion through cooperative society on rural development in the Indian context. The empirical results of ANOVA established that the development of rural areas was directly and positively affected by financial inclusion. Cooperative societies were enhancing financial access to rural people. But the satisfaction levels of the respondents differ based on demographic profiles. But overall, the contribution of cooperative societies to rural development was quite appreciable.

Cabeza-García et al. (2019) studied the relationship between economic expansion and women's financial inclusion using data from the World Bank Findex (2017). They made the empirical conclusion that the usage of financial services, such as credit and deposit accounts, had a significant positive effect on economic growth. Women's financial inclusion reduces the gender gap while simultaneously boosting their engagement in economic and productive activities.

Lee et al. (2020) evaluated how financial innovation and inclusion affected the expansion of firm sales in the setting of Asian economies. The empirical findings described financial inclusion enhances access to credit that positively enhances the sales growth of the firms and financial innovation has a negative effect on the sales growth of micro, small, and medium firms.

Neaime & Gaysset (2018) studied how financial inclusion affects financial stability in South Africa's MENA area. They identified that financial stability was significantly increased by financial inclusion, but poverty curbing was insignificantly affected. Further, they observed income inequality increasing due to population and inflation in the MENA region. As a concluding remark, the authors stated financial integration is an essential factor for financial stability, that can be achieved via financial inclusion.

Okello Candiya Bongomin et al. (2017) cross-sectional data from 169 SMEs was used to analyze the relationship between financial literacy and the growth of SMEs in the context of developing countries. They demonstrated that financial literacy drastically improved the nexus between financial access and the expansion of SMEs. Furthermore, both financial literacy and financial access had a substantial positive role in the growth of SMEs. It concludes that financial literacy among individuals and businesses would enhance their financial well-being in addition to the policymakers' financial inclusion initiatives.

Rastogi & Ragabiruntha (2018) investigated the determining factors of socioeconomic development via financial inclusion using primary data gathered from the rural areas of Tamil Nadu. They empirically found that financial inclusion enables socioeconomic development. Financial inclusion can be fastened via multiple factors

like online banking, understanding of financial services, and financial literacy. From the results, financial inclusion can be achieved via multiple delivery channels like internet banking, the spreading of bank branches and business correspondents, and providing financial literacy to rural people.

Sethi & Acharya (2018) inspected the nexus between economic prosperity and financial inclusion using the annual dataset of 31 countries. They determined that financial inclusion significantly boosted economic growth. They were also determined, through a panel causality test, the mutual impact of each other. They concluded expansion of bank services leads to sustainable growth.

Sharma (2016) researched the change in economic growth with change in financial inclusion. Financial inclusion, the independent variable, was measured with three variables namely – penetration of bank branches, availability of banking services, and usage of banking services. Economic growth, the dependent variable, was measured with the gross domestic variable (GDP). The empirical results of regression analysis found economic growth was substantially improved by financial inclusion. The authors concluded that the acceleration of financial inclusion was the enabler of economic progress.

Sharma et al. (2018) examined how financial inclusion policies affected India's economic growth. The empirical results of the univariate and multivariate analyses found the diverging outreach of financial inclusion policies. They concluded the financial infrastructure and penetration of financial institutions vary across the territories of India. Therefore, access to financial assets and liabilities varies from state to state.

Swamy (2014) studied how financial inclusion affected gender dimensions and the financial well-being of poor households in India. Financial inclusion policies and informal financial inclusion intermediaries like SHG had playing a significant role in women's empowerment. The author categorized women into three groups based on the caste category they belong to. Namely, SC/ST women, OBC women, and General women. Across all categories, women's access to financial liabilities improved who were covered under the SHG. General category women were more aware of financial products which makes them have wider access to finance compared with other category women. Swamy concluded financial inclusion initiatives have impacted the income and living standards of underprivileged women.

2.2 Digital Financial Services for Financial Inclusion.

The business world changed dramatically as a result of information technology (IT). In recent times all service providers are developing and offering their products through digital channels, which is assisting the continuous monitoring of customers and business operations. IT had facilitated the growth of electronic and mobile commerce and the development of competitive strategies for sustainable growth. Presently, IT is pervasive, no industry, firm, government, or the public at large is left without using IT.

Governments and international organizations have recognized IT as one of the potential components for achieving financial inclusion and sustainable development. Particularly emerging countries who were wishing to achieve the milestone of financial inclusion looking for alternative delivery channels to reach financially vulnerable people to bring them into the net of the financial system by providing

necessary financial services at affordable prices. Financial institutions started offering financial services through digital channels to meet the demands of customers and to expand their market share by reaching them at their convenience. Further digital financial services enable customers to use it around the clock and around the world.

Hewa Wellalage et al. (2021) have studied how ICT affects entrepreneur financial inclusion in five countries (Ghana, Kenya, Tanzania, Uganda, and Zambia). They empirically asserted that ICT has the potential element for the financial inclusion of innovative entrepreneurs. They also provided evidence that the main factor promoting widespread access to and use of financial services is m-money. Thomas et al., (2019) articulated that m-money (M-PESA) has accelerated the 70 percent of active users in Kenya.

Thomas & Suresh (2020) enquired about DFI in Kerala. They noticed that the most vulnerable groups' socio-economic change was strongly impacted by digital financial technologies. Digital technologies have provided more efficient management of finances and facilitated enhanced financial services usage. Further, they emphasized that the people who are using mobile devices have wider and more frequent usage of financial services than the people who depend on traditional bank branch users.

Shahrokhi (2008) emphasized that the rapid developments in internet technology have been reshaping the financial sector operations by improving operational and managerial efficiency and lowering operational costs. The increased usage of financial services and the expansion of e-finance, which led to the shift to digital economies, have been greatly accelerated by technology applications.

Bansal (2014) stated that ICT acts as the key driver for the development of platforms to accelerate financial inclusion by providing financial services to rural residents. He also stipulated that the technology is assisting in increased customer reachability and effective handling of financial risk for financial institutions.

Aziz & Naima (2021) in their study of DFI in Bangladesh, investigated a different aspect of electronic finance for financial inclusion. They noted that the acceptance of DFS would accelerate the process of financial inclusion and inclusive economic progress.

2.3 Determinants of Digital Financial Services Adoption

Though DFS are the potential to meet customers' financial needs, their actual usage has been varying across the world. For instance, M-PESA is the first m-banking service (Nayak et al., 2014). It received a good response from South Africans and enhanced savings, payments, remittances, and borrowing in South African countries. But m-banking acceptance is not the same as in South Africa in other developing countries. Therefore, researchers had been undertaken empirical studies to understand and identify the motivations for the acceptance and non-acceptance of DFS. This section summarizes the research studies' empirical findings from both the Indian and global contexts.

2.3.1 Indian context

A study by **Chawla & Joshi (2019)** employed an online survey to explore the perception of mobile wallet adoption by integrating the variables of the TAM and UTAUT. They used PLS-SEM to examine the hypothetical relationships of variables in the model. They observed that intentions to adopt mobile wallets were extensively

affected by perceived usefulness, trust, security, ease of use, facilitating conditions, lifestyle compatibility, and attitude.

A study on m-banking adoption by **Deb & Agrawal (2017)** identified output quality, personal innovativeness, ease of use, and subjective norms have a substantial influence on m-banking adoption through perceived usefulness. Similarly, **Gupta et al. (2017)** conducted an exploratory study by investigating how security worries affect customers in urban and metropolitan areas' use of m-banking. The authors identified that security was an essential concern for both urban and metropolitan customers while using mobile banking.

A study by **Gupta et al. (2017)**, employed the UTAUT and found that m-banking adoption is significantly determined by social influence, performance expectancy, facilitating conditions, effort expectancy, and credibility. They emphasized that credibility was an essential factor in m-banking acceptance among Indian customers.

Behavioral reasoning theory (BRT) was used by **Gupta & Arora (2017)** to list the factors for and against the use of m-banking. They found that ubiquitous, convenience, and relative advantage were vital factors for the acceptance of m-banking, whereas usage, risk, and tradition were reasons against m-banking acceptance.

Kumar et al. (2020) proposed a hypothetical model to know the factors of m-banking adoption by expanding TAM with four additional constructs: self-efficiency, personal innovativeness, trust, and subjective norms. The model was assessed with SEM, it was revealed that all exogenous components had a substantial impact on the acceptance of m-banking.

Kishore & Sequeira (2016) used an altered UTAUT to identify the aspects that influence m-banking among Karnataka's rural residents. They identified that m-banking adoption was significantly determined by performance expectancy, effect expectancy, social influence, perceived risk, and attitude.

Mohapatra et al. (2020) also employed the extended UTAUT by adding a perceived risk construct to determine the factors of m-banking adoption. They observed that, except the variable facilitating conditions, all research model elements influenced m-banking adoption.

Verma et al. (2019) designed an integrated model using the theory of planned behavior, norm-activation model, and government regulations to understand the continuous use of m-banking and found perceived behavioral control, subjective norms, attitudes, moral norms, merchants' pro-activeness, and demonetization regulation had a substantial impact on continuous use of m-banking.

Kaur & Arora (2020) investigated the effect of perceived risk in digital banking acceptance through a self-designed research model. The path relationships of the research model had examined with SEM. The empirical results explained that perceived risk has both a direct effect on behavioral intentions and an indirect effect via performance expectancy, hedonic motivation, social influence, and price value. The authors in this defined and measured it as a multi-facet construct. They concluded that risk perception of digital financial services was an important element of the acceptance of digital banking, authors empirically proved risk perception could be avoided through establishing trust.

Kaushik & Rahman (2015) investigated the determinant factors of the usage of self-service banking technologies (SSBT). The empirical results of the identified determinants of SSBT adoption vary from technology to technology. Therefore, the authors concluded that technology and digital financial services were dynamic in nature need to explore the antecedents of technology adoption. The main reasons for adopting SSBT were perceived utility and simplicity of usage.

Kesharwani & Singh Bisht (2012) assessed the impact of trust and risk on digital banking adoption via an extended TAM framework. the empirical findings showed that internet banking was negatively impacted by perceived risk. The results emphasize the risk elements of security and privacy were playing vital role in digital banking adoption. The perceptions of risk can reduce by creating trust among customers. Further risk can also reduce by designing digital financial services with high security.

Kumar Sharma & Madhumohan Govindaluri (2014) attempted to observe the key antecedents of acceptance of digital banking in the urban context of India via an extended TAM. To examine the research model by SEM the data was collected from National Capital Region (NRC). The results demonstrated that perceived usefulness and perceived ease of use were the primary factors determining the acceptability of digital banking. Further, perceived usefulness was determined by social influence and awareness of internet banking. And ease of use was influenced by self-efficacy and quality of internet connection.

Chakraborty (2019) conducted research using TAM on the variables affecting the usage of m-banking in rural areas. The data was collected from the rural area of West

Bengal to explore behavioral intentions and data was examined with multiple regression analysis. The adoption of m-banking depended heavily on perceived convenience. The adoption of m-banking was also influenced by trust and perceived ease of use. However, perceived usefulness had no effect on rural residents' adoption of m-banking.

Marakarkandy et al. (2017) carried out an investigation to know the enabling variables of internet banking adoption with an integrated TAM by using subjective norms, image, bank initiatives, self-efficacy, perceived risk, trialability, and government support. The SEM results identified that the integrated model able to explain variance in the adoption by 29.9 percent. The adoption of an internet bank was determined by image, subjective norms, self-efficacy, bank initiatives, perceived risk, trust, and government support.

Nagdev et al. (2019) assessed mediating role of demonetization between technology readiness and the use of IT-enabled banking services (ITeBS). A research model designed with demonetization as a fully mediating variable. The empirical results of SEM found that demonetization acted as a full mediating variable on the adoption of ITeBS.

Pal et al. (2020) carried out a research study to understand m-payment adoption with facilitating and hindering factors. From the results of facilitating conditions network externalities, trust, and habit had a substantial positive influence on m-payments' continuous usage. However, a major obstacle to the widespread use of m-payments was perceived risk. Further, the authors emphasized that m-payments enable the achievement of financial inclusion.

Patel & Patel (2018) investigated an extended TAM with additional constructs of perceived security and social influence to understand the behavioral intention of internet banking in Gujarat. They found that all constructs (perceived usefulness, perceived ease of use, social influence, and perceived security) of extended TAM found a substantial effect on internet banking adoption. Security was key and major determinant of adoption behavior. Followed by social influence, usefulness, and ease of use were significantly impacting internet banking adoption.

Patil et al. (2020) attempted to understand the customers' behavior of mobile payments via the meta-UTAUT model. This study mainly focused on customers' personal characteristics that influence on mobile payments. They found that mobile payments adoption was predicted by performance expectancy, intentions to use, and grievance redressal. Further, the intention was explained by social influence, facilitating conditions, and attitude.

Priya et al. (2018) investigated, among young customers, the determining factors of m-banking adoption. The empirical results found that ease of use, usefulness, credibility, and structural assurance were the key determinants of m-banking adoption. The authors also observed the behavioral intentions and the usage of m-banking were unaffected by perceived risk.

Shaw & Kesharwani (2019) carried out a study among young customers to understand the mediating impact of smartphone addiction on mobile wallet adoption. The outcomes of SEM and multi-group analysis described subjective norms, usefulness, and ease of use acting as key predictors of m-wallet adoption. Smartphone addiction significantly acts as a moderating variable of m-wallet adoption. Therefore,

they conclude smartphone addiction and ownership had an influence on mobile payments.

Sikdar & Makkad (2015) a study on internet banking adoption observed that accessibility, usage constraints, and intention to use were essential elements of the satisfaction of internet banking. However, this study revealed that trust and ease of use had a negligible impact on people's adoption of online banking. The authors stipulated that the insignificant effect of ease of use due to the easiness of the internet banking design, and the insignificant effect of trust due to the low level of internet banking penetration in the market.

Singh & Srivastava (2018) initiated a study to predict the intention of m-banking adoption in India. The empirical results of the study found four factors substantially influencing m-banking adoption out of six factors. The important variables explaining the adoption of m-banking were convenience, cost, self-efficacy, and security. While security was identified as the key factor of mobile banking adoption. The adoption of m-banking was insignificantly affected by trust and social influence.

Singh et al. (2020) attempted to understand the driving factors of FinTech adoption in India through SEM and multi-group evaluation methods. The authors developed a research model with the integration of TAM and UTAUT. The empirical results identified ease of use, social influence, and usefulness were the key factors of FinTech adoption among Indian customers. But the actual use of FinTech was negatively affected by social influence.

Sinha et al. (2018) carried out a study to understand the customers' readiness and privacy concerns about mobile payments in India. They found that adoption readiness

mediates the nexus between technology readiness and intention to adopt. Further, they also identified the moderator effect of security concerns between attitudes and mobile payment adoption. Therefore, it can understand that intentions and privacy concerns were the important factors in mobile payments adoption.

Sivathanu (2018) designed a research framework with the integration of UTAUT and innovation resistance theory to understand the actual usage of online payments during demonetization. The empirical results presented that all variables of UTAUT – social influence, effort expectancy, performance expectancy, facilitating conditions, hedonic motivation, and habit found as significant determinants of behavioral intentions. All factors of innovation resistance – usage barrier, value barrier, risk barrier, traditional barrier, and image barrier found as crucial variables of the use of digital payments. The constructs of the UTAUT and innovation resistance models, respectively, were thus statistically established to have a vital impact on the actual use of digital payments.

Sobti (2019) investigated the effect of demonetization on the diffusion of mobile payments in India with an extended UTAUT model. The PLS-SEM results displayed that the diffusion of mobile payments was positively affected by demonetization and facilitating conditions.

2.3.2 Global Context

Yan et al. (2021) used extended UTAUT with risk and trust to study the influencing variables of m-banking services in Bangladesh. They observed social influence, perceived value, and perceived trust had a direct effect on the behavioral intentions of m-banking adoption. Further, performance expectancy, effort expectancy, and perceived risk were antecedents of the perceived value of m-banking adoption. They

concluded that FinTech applications played a significant role in economic resilience during the pandemic.

Van et al. (2020) assessed the relationship among perceived risk, trust, and m-banking usage by using PLS-SEM in Vietnam. They found that the perceived risk had negative impacts on both trust and intentions to use m-banking. They measured perceived risk as a multi-dimension factor including financial risk, social risk, time risk, privacy risk, security risk, and performance risk. The empirical findings of the study described the risk element as the key element of the diffusion of m-banking.

Farzin et al. (2021) examined the UTAUT2 model among Iranian m-banking customers to draw major factors of mobile banking adoption. The empirical results observed all variables of UTAUT2 including effort expectancy, performance expectancy, social influence, facilitating conditions, perceived value, habit, hedonic motivation, and trialability were the major elements of mobile banking adoption. Further, the authors observed that word of mouth (WOM) significant influence on intentions and behavior.

Mouakket (2020) examined the impact of quality and personal attributes on mobile payments adoption in the United Arab Emirates. He found personal attributes (innovativeness and self-efficiency) and quality attributes (system and service quality) had a significant impact on effort expectancy. Further performance expectancy is determined by system and information quality.

Malaquias & Silva (2020) undertook a research study to understand the determinants of m-banking in rural Brazil. They determined that among Brazil's rural farmers trust, ease of use, and perceived usefulness were the vital elements of m-banking acceptance.

They concluded that m-banking enables rural people to access financial assets and liabilities from formal financial institutions.

Phonthanukitithaworn et al. (2016) examined a research study to identify the determinants of mobile payments among Thai customers through a self-designed research model. The model was statistically examined using SEM and the results identified compatibility, perceived risk, subjective norms, and perceived trust were the key antecedents of mobile payments adoption. The TAM constructs were found insignificant factors in mobile payments adoption.

Changchit et al. (2020) conducted a comparative study on determinant factors of mobile banking adoption among customers in the U.S. and Thailand. The authors used six independent variables –perceived privacy, perceived security, normative beliefs, perceived usefulness, perceived ease of use and technology competency were the determinants of mobile banking adoption. They found all independent variables acted differently between the two countries customers. For instance, perceived usefulness was not important for Thai customers, but for U.S. customers it was important.

Chemingui & Ben lallouna (2013) assessed the motivational and resistance factors of mobile financial services in Tunisia. The SEM results identified tradition as the resistance factor to mobile financial services adoption. And compatibility, perceived enjoyment, trialability, and system quality were the motivational factors of m-banking adoption.

Chen et al. (2016) reviewed the extended TAM to ascertain the key variables of internet financial services in Taiwan using SEM. The results found that perceived

usefulness and perceived complexity were the two major determinants of DFS among Taiwanese customers.

Chiu et al. (2017) initiated a research study to identify the major variables of the m-banking adoption intention of non-adaptors. Disposition of trust, infrastructure quality, perceived cost, privacy, and risk were the key variables of the behavioral intention of non-adaptors of m-banking through regression analysis. Trust acts as the key mediator between intentions and usage of mobile banking.

Chong et al. (2010) examined the influencing factors of online banking in Vietnam using multiple regression analysis. Government support, perceived usefulness, and perceived trust were identified as the key antecedents of online banking adoption among Vietnam customers. They observed that ease of use had a trivial influence on the adoption of online banking.

Damghanian et al. (2016) carried out a research study to assess the role of security to accept online banking through mediating variables – perceived trust and risk in Iran. SEM was used to evaluate how the variables related to one another. The results of the study identified a substantial effect of perceived trust and risk, and an insignificant effect of perceived risk on digital banking adoption. The authors remarked that perceived security was an essential element in online banking that should be addressed otherwise customers may pause and drop from using.

Shareef et al. (2018) Assessed how the determining variables of m-banking service change with respect to the adoption stages of customers in Bangladesh. The authors categorized adoption stages into three – static, interaction, and transaction. The statistical results observed that the determinant factors of m-banking were significantly

different for each stage of adoption. At the static stage perceived awareness, perceived ability to use, and perceived functional benefit were important. At the interaction stage perceived ability use, perceived functional benefit, and perceived information quality were important. At the transaction stage perceived ability to use, perceived functional benefit, and perceived security were important. Therefore, it can conclude that determining factors of digital financials were highly dynamic they act differently at different levels of adoption.

Elhajjar & Ouaida (2019) a research study carried out to explain the important determining factors of m-banking adoption among Lebanese customers. the primary data collected from customers was assessed with SEM, which found digital literacy, perceived risk, perceived ease of use, resistance to change, perceived usefulness, subjective norm, and personal innovativeness had a substantial impact on m-banking adoption. Insignificant influence of awareness and compatibility were also observed from the empirical results.

Foroughi et al. (2019) assessed the factors which were driving to continuous use of m-banking in Malaysia through partial least square analysis. The results observed that perceived usefulness and satisfaction were the drivers of the continuous use of m-banking. The authors emphasized that m-banking assists both customers and banks in their financial well-being.

Giovanis et al. (2018) examined the four competing theories (TAM, TPB, UTAUT, and DTPB) of information systems to explore which theoretical model acts better to explain the behavioral intentions of prospective users of mobile banking in Greece.

From the statistical results of the study, it can conclude that DTPB was the best among the four to predict behavioral intentions.

Giovanis et al. (2019) carried out research to examine the effect of features of technology, social, and personal in mobile banking adoption by extending the UTAUT model. The results observed that innovation performance expectancy, social norms, perceived risk, trust, and users' innovativeness were key determining factors of mobile banking technology adoption among Greece customers.

Glavee-Geo et al. (2019) assessed the driving factors of m-money usage in Ghana PLS-SEM. They identified that subjective norms, performance expectancy, perceived risk, effort expectancy, and consumer empowerment had a substantial effect on m-money usage. The authors emphasized that addressing customer issues and empowering customers about mobile money would lead to customers' intention to continue.

Hussain et al. (2018) assessed the determinant factors of mobile payments adoption using the UTAUT theoretical model among bottom-of-the-pyramid customers. The SEM results revealed effort expectancy, performance expectancy, habit, facilitating conditions, and social influence had a substantial influence on the behavioral intention to adopt mobile payment. Authors suggested that more studies should conduct in developing countries to identify the antecedents of mobile payments adoption behavior that helps the successful diffusion of digital financial products successfully among bottom-of-the-pyramid customers.

Inegbedion (2018) investigated to know the influencing factors of electronic banking adoption behavior in Nigeria. The empirical results observed that knowledge,

perceived risk, ease of use, and nature of the transaction had a strong influence on electronic banking adoption. Therefore, all financial institutions should empower their customers with financial technologies for the effective and efficient use of online financial services.

Jung et al. (2020) assessed the motivations and intentions of U.S. customers toward the usage of mobile payments with an extension of the UTAUT theoretical model. They identified that social influence, performance expectancy, knowledge, trust, and compatibility were the major predictors of mobile payment adoption among U.S. customers.

Kuo (2020) carried out an investigation on the switch behavior of people to mobile payments in Taiwan with research model, based push-pull-mooring framework. The empirical results observed that regret, alternative attractiveness, perceived network size of the alternative, and perceived complementarity of the alternative had a significant positive impact on switching intentions. Inertia had a significant negative impact on switching intention. Further, regret was determined by dissatisfaction with information quality and dissatisfaction with system quality, and inertia was determined by benefit loss costs, uncertainty costs, and sunk costs. Therefore, as a concluding remarks authors emphasized that regret of the alternatives, attractiveness of the alternatives, complementarity from alternatives, and network size of the alternatives causing for switching to mobile payments in Taiwan.

Luna et al. (2019) assessed the adoption behavior of the customers between three different m-payments – short message service (SMS), near field communication (NFC), and quick response (QR). The empirical results identified that subjective

norms, perceived usefulness, and attitude were significant antecedents of all three m-payments technologies adoption behavior. But perceived security was found significant impact on SMS and NFC adoption behavior. Further, ease of use had a substantial impact on the perceived usefulness for all three mobile payment technologies, subjective norms was found significant antecedent to the ease of use for all three m-payments platforms. Ease of use has a substantial impact on the attitude toward SMS technology only.

Maditinos et al. (2013) examined the critical factors influencing the acceptance of internet banking with extended TAM by perceived risk and quality of internet connection in Greece. The SEM results observed that perceived usefulness and perceived risk had a substantial effect on the intention of internet banking adoption, whereas ease of use and internet connection quality had an insignificant impact.

Makanyeza (2017) investigated the important predictors of m-banking adoption intentions in the context of Zimbabwe. Perceived usefulness, self-efficacy, relative advantage, social influence, and credibility had a substantial positive effect on intentions to adopt mobile banking, whereas the perceived risk was identified as a substantial negative impact. Ease of use, complexity, facilitating conditions, trailability, awareness, and demographic variables found insignificant impact on intentions to adopt m-banking.

Marafon et al. (2018) assessed the influence of perceived risk and self-confidence on the intention to adopt internet banking in Brazil. Self-confidence and risk acceptance had a substantial impact on the intentions of internet banking adoption and moderating the nexus between perceived risk and intentions. Further, the authors empirically found

that the people who were with great self-confidence had lower risk and vice versa. Therefore, self-confidence had a vital role in avoiding risk and intentions to adopt digital banking.

Mohammadi (2015) conducted a research study exploring the key barriers and determinants of m-banking adoption in Iran. The SEM results found that the intention of m-banking adoption was influenced by usefulness and attitude. The attitude was influenced by ease of use and usefulness. Usefulness and ease of use were influenced by resistance, low perception risk, compatibility, and awareness. But self-efficacy had no impact on the attitude toward m-banking adoption.

Mohd Thas Thaker et al. (2019) examined the factors influencing m-banking adoption in Malaysia. The PLS-SEM results revealed that perceived risk and usefulness had an impact on the adoption of m-banking adoption. But ease of use, relative advantage, and subjective norms had no effect on m-banking adoption.

Naruetharadhol et al. (2021) investigated the factors affecting the intentions of use of m-banking in Thai with an integrated model of Self-service technology (SST) and TAM. The results found that dimensions of SST (function, enjoyment, security, assurance, design, convenience, and customization) and TAM (usefulness and ease of use) had a substantial effect on the intention of m-banking usage.

Nasri & Charfeddine (2012) examined the impact of the dimensions of TAM and TPB on internet banking acceptance in Tunisia. The findings of the SEM revealed that attitude was determined by perceived ease of use, perceived usefulness, and security and privacy, whereas perceived behavioral control was determined by self-efficacy, government support, and technology support. Overall, the behavioral intentions of

internet banking acceptance were affected by attitude, subjective norm, and perceived behavioral control.

Owusu Kwateng et al. (2018) examined the constructs of the UTAUT2 to detect the predicting variables of acceptance and use of mobile banking in Ghana. The empirical results found that habit, trust, and price value were major factors of m-banking acceptance and use. The intention was positively affected by performance expectancy and negatively affected by price value. All other factors had an insignificant impact on intentions to adopt mobile banking.

Park et al. (2019) examined the influence of multi-benefit factors on m-payment services among U.S. customers. They found that convenience, economic, and enjoyment benefits were the major predictors of m-payment service adoption.

CHAPTER – 3

OBJECTIVES AND THEORETICAL FRAMEWORK

Outline of the Chapter

This chapter discusses the research gap, statement of the problem, objectives of the study, significance of the study, theoretical framework, popular theoretical models of Information systems, research model, and research hypothesis.

3.1 Research Gap

The term research gap denotes to missing and/or inadequate information in the available literature to address the research problem. From the extent literature survey two research gaps had been observed.

Research Gap 1

Most of the existing research is done on the measurement of financial inclusion through either supply-side or/and demand-side aspects. Supply-side elements include the number of bank branches, ATMs, and Bank Mitra for the population. On the demand side elements include accessibility and usage of financial products like deposit and investment accounts, credit and loan products, and insurance products.

Research Gap 2

Further, existing studies on determinants of digital financial services had been largely identified in the context of the urban context, but scant research has been undertaken in rural areas.

Thus, this study is being conducted to address the research gap.

3.2 Statement of the Problem

Despite the tremendous surge in the usage of the internet and smartphones, to some extent computers, in rural areas. But among rural residents, digital financial services usage is still relatively new. Hence, there is a need to explore and understand the reasons behind the low and slow rate of DFS adoption.

3.3 Objectives of the Study

The objectives of this study are proposed based on a literature survey, the research gap, and the problem of the statement.

Main Objectives

1. To investigate and understand the facilitating factors of digital financial services adoption and continuous use among rural people.
2. To investigate and understand the pausing factors of digital financial services adoption and continuous use among rural people.

Sub-Objectives

1. To investigate the acceleration of financial inclusion through digital financial services.
2. To investigate whether digital financial services adoption assists rural people to access wider and different financial services.
3. To investigate whether digital financial services adoption and usage help rural people to meet specific financial needs.

3.4 Significance of the Study

Financial services are the key players in financial stability and economic development. But the availability and usage of financial services are significantly different across global territories, especially in rural areas. Hence, governments and central banks are developing policies to provide financial services for all and developing innovative delivery channels to boost the active and frequent use of appropriate financial services.

GoI had achieved the opening of bank accounts for all households, but most of the bank accounts are inactive. Traditional banking channels alone do not facilitate the active use of accounts. To achieve desirable financial inclusion governments and financial institutions should develop alternative channels and products. Financial Technology is one of the alternative means to enhance and engage customers for their active use of accounts and financial services.

1. This study assists in the understanding of the important variables that rural people considered in the adoption and usage of DFS.
2. This study assists in understanding the main obstacles to the adoption and usage of DFS.
3. This study assists in developing and designing innovative financial products for rural markets.

3.5 Theoretical Framework

Through an ample literature survey on digital banking adoption, it has been observed different technology acceptance models and theories - The technology acceptance model (Davis, 1989) and its extension TAM2 (Venkatesh & Davis, 2000), the theory of planned behavior (Ajzen, 1991), decomposed theory of planned behavior (Taylor

& Todd, 1995), unified theory of acceptance and use of technology (Venkatesh et al., 2003) and its extension UTAUT2 (Venkatesh et al., 2012), and diffusion of innovation theory (Rogers, 1983). These were the models popularly used in the context of information systems, mobile technology, and digital banking. TAM and TPB were developed from the theory of reasoned action, whereas the UTAUT model was designed from eight popular models of IS adoption including TRA, TAM, TPB, and DOI.

3.6 Popular Technology Adoption Theories

To accomplish the research objectives of this study a research model was designed by integrating many constructs from different well-established theoretical models. These theories were developed to explore and understand the behavior of customers toward the adoption and use of innovative products and information systems. Some of the important theories are discussed below.

3.6.1 Theory of Reasoned Action

TRA was developed by Fishbein & Ajzen (1975) to capture the behavior and intentions of an individual to perform a particular action. According to this theory, the human intention was determined by subjective norms and attitudes. Whereas attitude was expressed as “the positive and negative perceptions or beliefs relating to the performance of an activity”. Subjective norms was expressed as “the social network like family, relatives, friends, and other important people influencing an individual’s behavior towards the performance of an activity”.

3.6.2 Diffusion of Innovation

DOI was developed by Rogers (1962). This theory emphasizes how a new product or technology would succeed, over some time, in a social setting. In this model, the people had been divided into innovators, early adopters, early majority, late majority, and laggards based on their move to adopt an innovation.

The adoption behavior of an individual's influenced by relative advantage, compatibility, complexity, trainability, and observability. Relative advantage is defined as "the degree to which an innovation is seen as better than the idea, program, or product it replaces". Compatibility is defined as "how consistent the innovation is with the values, experiences, and needs of the potential adopters". Complexity is defined as "how difficult the innovation is to understand and/or use". Traibility is defined as "the extent to which the innovation can be tested or experimented with before a commitment to adopt is made". Observability is noted as "the extent to which the innovation provides tangible results". These five variables influence the adoption of an innovation differently for different groups.

3.6.3 Theory of Planned Behavior

TPB was developed by Ajzen (1991) as an extension of TRA to capture the intentions of human behavior. Perceived behavioral control is proposed as an additional construct of the original TRA model. Perceived behavior control is stated as "an individual's perception about either ease or complexity of performing behavior of interest".

3.6.4 Decomposed Theory of Planned Behavior

DTPB was developed by Taylor & Todd (1995). It is an alteration of TPB by decomposing the belief constructs. Attitude is decomposed by an individual's perception of performance and the complexity of the information system. Subjective norms are decomposed by the important other peers into different categories like superiors, colleagues, and subordinates. Perceived behavioral controls decomposed by self-efficacy and facilitating conditions.

3.6.5 Technology Acceptance Model

TAM was developed by Davis (1989) as an extension of TRA to understand an individual's actual usage behavior of information systems. This model emphasized that two variables, ease of use and usefulness, are the key determinants of technology adoption behavior through attitude. Perceived usefulness refers to "the degree to which an individual believes that using a particular system would enhance his or her job performance". Perceived ease of use is defined as "the degree to which an individual believes that using a particular system free from physical and mental efforts". Use is defined as "an individual actual direct usage of the given system in the context of his or her job".

3.6.6 Unified Theory of Acceptance Use of Technology

UTAUT was developed by Venkatesh et al. (2003) by integrating eight important competing theoretical models of information systems, namely – The theory of reasoned action, the Technology acceptance model, the Motivational model, the Theory of planned behavior, combined TAM and TPB, model of PC utilization, diffusion of innovation, and social cognitive theory. The UTAUT model was

developed with seven exogenous variables – performance expectancy, effort expectancy, social influence, facilitating conditions, self-efficacy, anxiety, and attitude toward using technology.

3.6.7 Innovation Resistance Theory

IRT was proposed by Ram & Sheth (1989). The authors identified reasons for consumers' resistance to innovation into two groups. First, functional barriers arise from the usage, value, and risk of innovation. Second, psychological barriers arise from customers' traditions and customers' perceived image of innovation. The success or failure of innovative technology is depending on the customers' resistance behavior. The authors emphasized that customers generally refuse to adopt an innovation that needs to change existing practices, needs to learn the usage of new technology, and may be new technology not compatible with customers' prior beliefs.

3.7 Research Model

This study's research model consists of five exogenous constructs: relative advantage, ease of use, self-efficacy, subjective norms, and perceived risk, and two endogenous constructs: DFS adoption and digital financial inclusion (continuous use of DFS). The proposed research model has five independent variables, all of which are well-researched and found significant in the technology adoption literature.

3.7.1 Relative Advantage

Relative advantage denotes “*the benefits received by a user from the usage of digital financial services compared with other alternatives*”. It can be wide access to different financial services, time-saving, availability of services, convenience to initiate

financial transactions, etc. This variable is taken from DOI (Rogers, 1962). The perceived usefulness of TAM and performance expectancy of UTAUT represent the same notion of relative advantage (Venkatesh et al., 2003; Debasish, 2015). This variable has been found a significant antecedent in different technology-related literature. For instance, the uber mobile application acceptance by Min et al. (2021), the voluntary adoption of information systems in the organization by Zhou (2008), the e-commerce adoption by Eastin (2002), and internet banking adoption by Rambocas & Arjoon (2012), Md Nor et al. (2010), Tan & Teo (2000), and mobile banking adoption by Jahan & Shahria (2021), Al-Jabri & Sohail (2012). The existing literature emphasized that more users' perceived benefits can enhance the usage of technology. Therefore, in this study, we are examining the impact of relative advantage on adoption and intention to continuously use DFS.

3.7.2 Ease of Use

Ease of use denotes to *“the extent users need to put effort to use digital financial services”*. This construct had been found a significant impact on technology adoption literature. The complexity (acronym of ease) of DOI and the effort expectancy of UTAUT are represents a similar notion of ease of use. The success or failure of the technology adoption is highly dependent on the efforts exercised by the users. This construct stipulates that the wide acceptance of technology depends on the less or no effort employed by users. Much of the TAM-based literature identified ease of use as a substantial predicting variable of perceived usefulness (Chawla & Joshi 2017; Deb & Agrawal 2017; Priya et al. 2018). Therefore, in this study, we are examining the impact of ease of use on relative advantage, adoption, and continuous use of DFS.

3.7.3 Subjective Norms

Subjective norms denote *“the peers’ influence on behavior. Generally, we consult immediately available people, who are experienced and experts, to decide on the use of the innovative product”*. Social pressures come from people like family members, friends, colleagues, and teachers. In this study, social influence refers to *“important other people recommend to use of m- banking”*. Numerous researchers also empirically proved subjective norms had a substantial impact on m-banking adoption (Deb & Agrawal 2017; Elhajjar & Ouaida 2019). Kesharwani & Singh Bisht (2012) identified that subjective norms positively affect perceived risk.

3.7.4 Self-Efficacy

Self-efficacy denotes in this study is *“the users’ competency and ability to use digital financial services by using a mobile device”*. DFS is the product of technology that required skills and confidence to conduct financial and non-financial transactions through digital gadgets. Many researchers identified empirically the importance of self-efficacy for the usage of innovative digital products (Anouze & Alamro 2019; Changchit et al. 2020; Correa et al. 2020). Users’ ability makes it easy of using an innovative product that provides an opportunity to gain the utmost usefulness and benefits. Further, users’ ability of digital products usage enables them to avoid potential threats and risks that arise from technology (Al-Jabri 2015; Compeau & Higgins, 1995; Guriting & Oly Ndubisi 2006; Gu et al. 2009).

3.7.5 Perceived Risk

The success of the usage of DFS is influenced by the safety and security ensured by the financial institutions concerning the financial and personal information of the customers. Customers are more concerned about privacy and financial risk while using mobile banking (Bashir & Madhavaiah 2015; Phonthanakitithaworn et al. 2016). Risk in mobile banking is a negative attitude about the security of money, financial information, and privacy due to uncertainty embedded with technology. It may cause due to hacking of mobile phones, loss of mobile phones, due to poor service quality, and loss of authentication details. In the literature on mobile banking, the risk is classified in numerous ways like financial risk, privacy risk, social risk, performance risk, etc (Kaur & Arora 2020; Maditinos et al. 2013). One of the main obstacles to mobile banking adoption is the risk perceptions of the customers (Chaouali & Souiden 2019; Chen 2008; Giovanis et al. 2019)

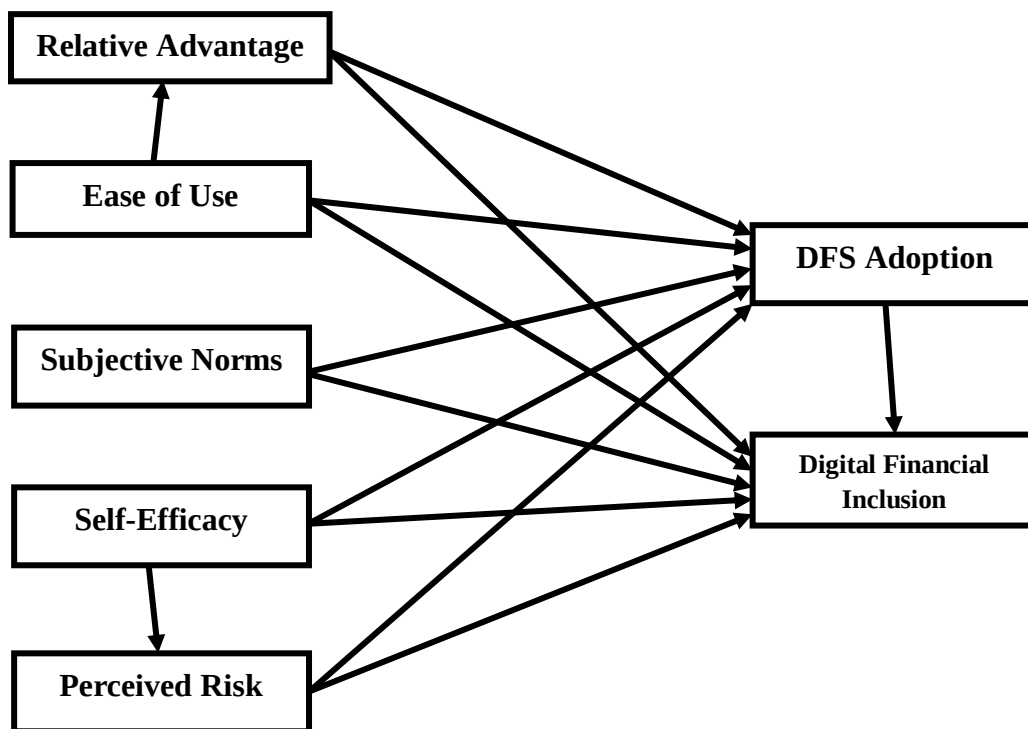
3.7.6 DFS Adoption

The term adoption is used in different ways in the context of information systems and financial technology literature. In this study, the adoption of DFS denotes to “*the acceptance of DFS by rural people to perform financial transactions and meet their financial needs*”. DFS help to active use of financial accounts. As the Findex report (2017), around 50 percent of bank accounts remain unused, this problem can be overcome with the help of digital channels and enhances the active usage of financial services for the meeting of needs and obligations. The Adoption of DFS construct was used in this study as both an endogenous as well as an exogenous variable.

3.7.7 Digital Financial Inclusion

DFI denotes to “*the continuous use and access to a wide variety of financial services via a digital channel: online banking, mobile banking, and digital payments to digital means*”. Digitalization of financial services helps both customers and financial institutions to meet financial requirements. DFS are cost-effective and efficient in performing financial transactions real-time and whenever the customers intended to perform. Digital channels facilitate identification and exposure to a variety of financial services. Therefore, DFS would contribute to the acceleration of financial inclusion.

Figure 3.1 – Research Model



3.8 Operational Definitions

Table 3.1: Operational Definitions

Relative Advantage	The extent to which using digital financial services provides more advantages than other alternatives.
Ease of Use	The extent to which using of digital financial services are perceived as easy to use.
Subjective Norms	The extent to which individuals' decisions are influenced by peers and social and mass media.
Self-Efficacy	The user's ability and confidence in the use of digital financial services.
Perceived Risk	The extent of uncertainty associated with the use of digital financial services.
DFS Adoption	The acceptance of digital financial services to perform financial transactions.
Digital Financial Inclusion	The continuous access and use of suitable financial services through digital means by the rural people.

3.9 Research Hypothesis

H1: Relative Advantage has a significant impact on DFS Adoption.

H2: Relative Advantage has a significant impact on DFS Continuous Use.

H3: Ease of Use has a significant impact on DFS Adoption.

H4: Ease of Use has a significant impact on DFS Continuous Use.

H5: Ease of Use has a significant impact on Relative Advantage.

H6: Subjective Norms have a significant impact on DFS Adoption.

H7: Subjective Norms have a significant impact on DFS Continuous Use.

H8: Self-Efficacy has a significant impact on DFS Adoption.

H9: Self-Efficacy has a significant impact on DFS Continuous Use.

H10: Self-Efficacy has a significant impact on Perceived Risk.

H11: Perceived Risk has a significant impact on DFS Adoption.

H12: Perceived Risk has a significant impact on DFS Continuous Use.

H13: DFS Adoption has a significant impact on DFS Continuous Use.

CHAPTER – 4

RESEARCH METHODOLOGY

Outline of the Chapter

Research methodology refers to the specific steps used by a researcher to study a research topic; it is a systematic and scientific technique taken by a researcher to achieve a research objective and solve the research problem. The research methodology provides detailed information about the approach adopted for the empirical research investigation. Like the target population, data gathering methods, statistical methods, and software used for the testing of the hypothesis.

The main objective of the study is to inspect the variables that are influencing the adoption and use of DFS in rural people. This chapter presents a detailed procedure adapted for questionnaire design, target population, recruitment of sample, the requirement of sample size, sampling method for data gathering, statistical methods used for data analysis, and software employed for data analysis.

4.1 Research Design

Research design explains the nature of the study and the type of data used for the research study. This study is a cross-sectional exploratory and descriptive research. A cross-section study means data has been obtained at only one point in time for the assessment of the research hypothesis. Exploratory research design can be used where a research problem is not defined precisely to better understand the research problem or to explore the factors causing the research problem. Exploratory research also is employed when researching phenomena at the initial stage. The objective of the study is to inquire about the determining factors of DFS among rural people, which examines

the direction and type relationship among variables including measurement and manifest variables. Therefore, this study is a kind of exploratory research design because digital financial services are new for rural people and from the literature survey it is also found rural areas were ignored. Therefore, for this study, the exploratory research design is suitable for the understanding of DFS in the rural context. Further, this study describes the different demographical characteristics of the sampling respondents and their experiences with technology usage.

4.2 Questionnaire Design

A self-administered questionnaire was developed for the data recruitment. The questionnaire has been segregated into four sections. The first section was designed for knowing the demographical information of the respondents, the second section was designed for knowing the subscriptions of different financial products. The third section was designed for knowing the technology user experience. The last section was designed to measure the determining factors of the adoption of digital financial services.

The last section of the questionnaire was designed with 32 statements to capture seven variables of the research model. All 32 statements were evaluated on a seven-point Likert scale on the agreement and disagreement level of the respondents with the range of 1 to 7. Where, 1 was assigned for '*strongly disagree*', 2 was assigned for '*moderately disagree*', 3 was assigned for '*disagreeing*', 4 was assigned for '*neither agree nor disagree*', 5 was assigned for '*agree*', 6 was assigned for '*moderately agree*', and 7 was assigned for '*strongly agree*'.

All the measurement statements were taken from the existing literature and altered according to this study. Five statements of relative advantage adapted from Lin (2011) and Sobti (2019), five statements of ease of use adapted from Kim et al. (2010), Lin (2011), and Deb & Agrawal (2017) four statements of subjective norms adapted from Sobti (2019), four statements of self-efficacy adapted from Susanto et al. (2016), and four statements of perceived risk-adapted from Yu (2012), five statements of DFS adoption adapted from Zhou et al. (2010), and five statements of digital financial inclusion (intention to continuous use) adapted from Owusu Kwateng et al. (2018).

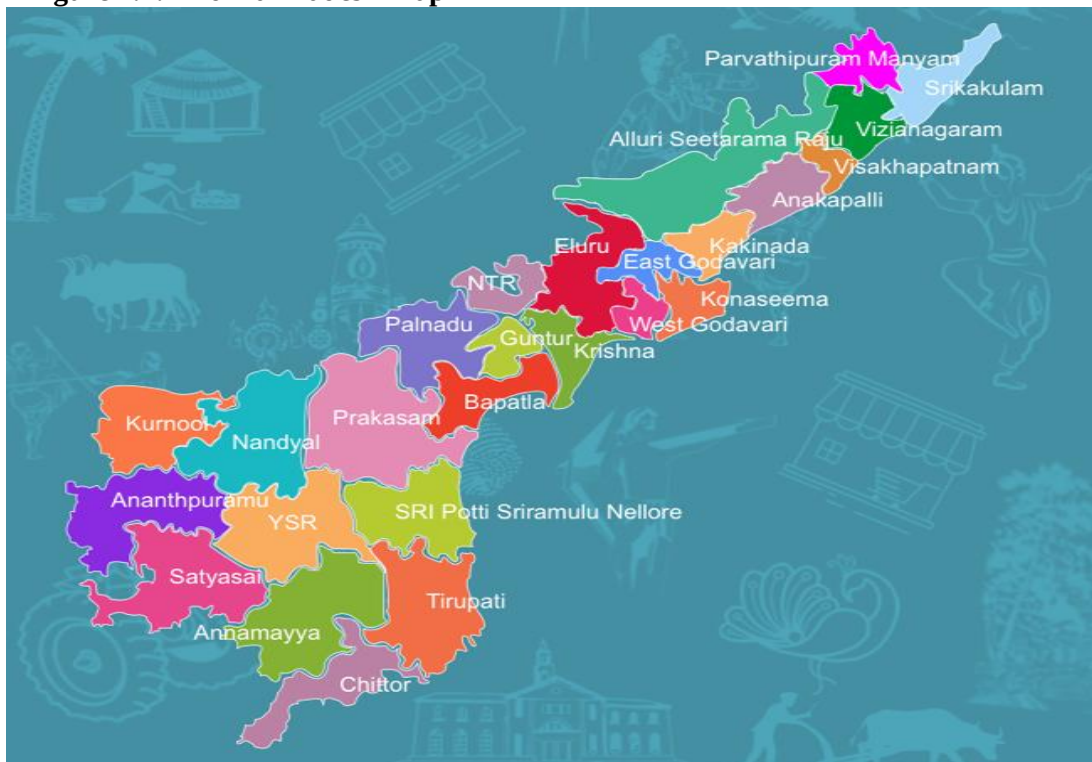
4.3 Target Population of the Study

Banerjee & Chaudhury (2010) defined “a population as an entire group about which some information is required to be ascertained”. This study investigates the state of Andhra Pradesh. The target population of this study is rural residents of Andhra Pradesh who have attained the age of 18 years and using digital financial services. Present users can better explain the attributes that are leading and pausing for adoption and continuous use of digital financial services.

4.4 Important Metrics of Andhra Pradesh

Andhra Pradesh state has a population of 49.69 million (after bifurcation in 2014) as per the 2011 census spread across 26 districts and around 70 percent of the population lives in the rural area (www.ap.gov.in). The working population of the state was around 46.5 percent, and the non-working population is 53.5 percent. 37.3 percent of the total working population was engaged in agriculture.

Figure 4.1: Andhra Pradesh Map



Source: Andhra Pradesh official website (www.ap.gov.in)

A total of 10,269 bank branches were functioning in Andhra Pradesh. A total of 12,196 ATMs were functioning in Andhra Pradesh, among them 2,409 ATMs serving in rural and 3,889 ATMs serving in semi-rural (RBI, June 2022). The entire population of Andhra Pradesh cannot be served by the current financial infrastructure.

Especially, rural populations were unable to avail of financial services from banks due to the distance of the bank branches. Therefore, digital financial services are the best alternatives for serving the rural population, which enables them to bring into the formal banking and financial system. Mobile subscription has been on an increasing trend in Andhra Pradesh, according to TRAI 2020 annual reports, around 8.71 million people subscribed to mobile wireless networks. That show an opportunity for the

spreading of financial services through mobile phones. Andhra Pradesh state is apt for the study to understand the determinants of DFS to achieve financial inclusion.

4.5 Sampling Method

Both convenience and snowball sampling methods (non-probability) sampling techniques were used in this study to recruit potential samples for the achievement of the research objectives.

Convenience sampling refers to the collection of data from immediately available representative respondents of the population of the study. Convenience sampling would help a researcher when he could not have access to the entire population of the study and/or when a researcher had difficulty identifying the representative sample of the study.

Snowball sampling refers to the researcher initially recruiting participants, and these initial participants help to recruit future respondents for the study. This technique helps the researcher when he is facing challenges or difficulties to obtain data from the target potential population of the study. The researcher may face difficulty due to unknown to the respondents and hesitate to give important personal information to strangers.

This study involved the collection of personal and financial information of the respondents. Some respondents may be unwilling to provide their personal and financial information.

Therefore, in this study, convenience and snowball sampling methods were employed to gather the data needed to assess the research hypothesis. The blend of convenience

and snowball sampling methods helps to achieve reliable results for the research investigation.

4.6 Sample Size

This study employs the PLS-SEM method to assess the hypothetical relationships among the constructs. The required sample size for structural equation modeling (SEM) statistical analysis was extensively discussed by Hair et al. (2014). He suggested minimum required sample size for running SEM statistical analysis was 15 sample respondents for each measurement variable. Hence, the minimum required sample size for the reliable results of the analysis was 480 (15 samples $\times$ 32 measurement variables). Hence, the sample size of 665 respondents was able to evaluate the reliable result.

4.7 Statistical Methods and Software

Structural model equation statistical analysis pertains to establishing and explaining the nexus between measurement variables and their intended latent variables and establishes and assesses the relationship between latent variables simultaneously. The PLS-SEM was employed to examine the research model's hypothetical relationships through SmartPLS software. PLS-SEM is a second-generation statistical method for analyzing multivariate data, which helps with the simultaneous examination of data for multiple variables of the study. PLS-SEM is a sophisticated statistical analysis to examine complex research models and focus on the prediction of variance in the dependent variable.

Hair et al. (2017) suggested that PLS-SEM can use if the objective of the study was;

1. Either exploratory or confirmatory the nature of the research.
2. Analysis of prediction.
3. Assessment of research model based on total variance.
4. Assessment of the nexus between independent and dependent latent variables.

SmartPLS-SEM (version 3.3.9) software was used for the data analysis. SmartPLS was the robust software that can evaluate both the inner model and outer model simultaneously. The inner model examines the reliability and validity of data for latent variables. The outer model examines the relationships between the latent variable presented in the research model.

In addition to SmartPLS, JAMOVİ (version 2.2.5) was used for the assessment of descriptive statistics and common method bias.

CHAPTER – 5

DATA ANALYSIS AND RESULTS

Outline of the Chapter

This chapter describes the procedure and statistical methods used to analyze the data collected from current users to explore and understand the determining factors of DFS in the context of rural. For the data collection, a questionnaire was designed in four sections. The first section explains the socio-economic profiles of the respondents. The second section explains the financial products subscribed by the respondents. The third section describes the respondents' technology and DFS usage experience (in years). The frequency statistical methods used for the data analysis of the first three sections. The fourth section of the questionnaire was designed to capture the motivating and hindering factors of the adoption and continuous usage of DFS. PLS-SEM statistical method was used for the data analysis of the fourth section in a two-step procedure.

5.1 Demographics of Respondents

The demographical profiles of the participants were listed in Table 5.1. The participants of the study portrayed that males were 87.97 percent and females were 12.03 percent. The frequency statistics of gender representation that most of the DFS users were male in rural areas.

The frequency statistics of age represent that most of the digital financial services users were aged between 18 to 45 years representing almost 90 percent; aged between 18 - 25 represented 26.02 percent, aged between 26 – 35 represented 34.59 percent, aged between 36 – 45 represented 29.77 percent, and aged above 46 represented 9.63. The

young people in rural areas using digital financial services were passionate about digital technologies.

The educational levels of the participants were either undergraduate or postgraduate. 35.94 percent of the participants were undergraduates and 34.29 percent were postgraduates. These participants who have school education represent a mere 4.21 percent, intermediate education represents 11.73 percent, and other educational qualifications represent 13.83 percent. From the education levels of the respondents, it can draw that education level plays a significant role in technology usage.

The occupation of the participants was classified into 6 based on their main source of income though people in rural areas engaged in multiple jobs. Respondents of the study belong to the business category represent 16.69 percent, the job category represents 20.60 percent, the farming category represents 18.80 percent, the daily wages category represents 31.43 percent, and students and those looking for a job together represent only 12.49 percent. In rural areas, most people were engaged in multiple jobs.

The monthly income levels of the participants were also classified into 6 groups. The respondents below 5000 represent 4.51 percent, income between 5,001 – to 10,000 represent 11.43 percent, income between 10,001 – 15,000 represent 18.20 percent, income between 15,001 – 20,000 represent 20.60 percent, income between 20,001 – 25,000 represent 23.61, and income above 25,000 represent 21.65 percent. From the income levels of the participants, it can be understood that people who have high incomes would use digital financial products frequently.

Table 5.1: Demographic profiles of respondents

Demographics	Frequency	Percentage
Gender		
Male	585	87.97
Female	80	12.03
Age		
18 – 25	173	26.02
26 – 35	230	34.59
36 – 45	198	29.77
46 – 55	46	6.92
Above 56	18	2.71
Education		
School	28	4.21
Inter	78	11.73
UG	239	35.94
PG	228	34.29
Others	92	13.83
Occupation		
Business	111	16.69
Daily wage	209	31.43
Farming	125	18.80
Job	137	20.60
Student	40	6.02
Unemployed	43	6.47
Monthly Income		
Below 5,000	30	4.51
5,001 - 10,000	76	11.43
10,001 -15,000	121	18.20
15,001 - 20,000	137	20.60
20,001 - 25,000	157	23.61
Above 25,000	144	21.65
Marital Status		
Married	462	69.47
Separated	8	1.20
Unmarried	178	26.77
Widow	17	2.56

Note: Total Respondents are 665

Most of the participants were married which was 69.47 percent of the total respondents and unmarried people were 26.77 percent. The people we separated were just 1.20 percent and widows were 2.56 percent.

5.2 Financial Products Subscribed

Table 5.2 listed different financial products subscribed by the participants. All the participants of the study had bank savings accounts, which may be due to the PMJDY program, a mission scheme for financial inclusion launched by the GoI in 2014. 379 respondents had term deposits, which represent 56.99 percent of the total respondents. 80.60 percent of the respondents had loan accounts at financial institutions, which portrays that the respondents had anyone or more loan accounts at banks. 72.63 percent of the total respondents subscribed to life insurance premium. 44.66 percent of the respondents subscribed to pension.

Table 5.2: Using of Financial Services

Financial Product	Status of using	Frequency	Percentage
Saving Account	Using	665	100.00
	Not	0	0.00
Term Deposits	Using	379	56.99
	Not	286	43.01
Loan Account	Using	536	80.60
	Not	129	19.40
Life Insurance	Using	483	72.63
	Not	182	27.37
Pension	Using	297	44.66
	Not	368	55.34

5.3 Technology Usage Experience

The previous usage experience of computers, smartphones, and the internet were presented in table 5.3. All the respondents had usage experience with smartphones and the internet. But 32.78 percent of the respondents did not have any previous experience with the usage of computers. The technology experience of the respondents was classified into 5 groups. The first group was designed to know whether the respondents had technology usage or not. The second group was designed to know the respondents had experience below a year; in this group 9.32 percent had computer experience, 10.08 percent had smartphone experience, and a mere 4.96 percent had internet usage experience. The third group was designed to know how many of the respondents were had experience between 1 – 3 years of usage experience, and the fourth group designed to know how many of the respondents had technology experience between 4 – 5 years of experience. Most of the respondents had computer usage experience between 1 – 5 years for all categories of technology. Maximum respondents had smart phone usage above 5 years, that was 41.20 percent of the total respondents.

Table 5.3: Technology Experience

Levels of Experience	Computer		Smart Phone		Internet	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Nil	218	32.78	0	0.00	0	0.00
Below 1	62	9.32	67	10.08	33	4.96
1 – 3	121	18.20	158	23.76	188	28.27
4 – 5	131	19.70	166	24.96	253	38.05
Above 5	133	20.00	274	41.20	191	28.72
Total	665	100.00	665	100.00	665	100
Ownership of Devices	184	27.67	665	100		

5.4 Digital Banking Usage Experience

Three digital financial services namely – internet banking, mobile banking, UPI payments had been considered to know the years of experience (Table 5.4). All the respondents had experience of mobile banking and UPI payments usage experience above a year, except for internet banking 65.71 percent of the respondents had not any experience of internet banking. Internet banking usage was very low among rural people as compared with mobile banking and UPI payments. 39.25 percent of the respondents had mobile banking and 18.35 percent had UPI payments experience below a year. Most of the respondents of the study had mobile banking and UPI payment experience between 1 – 3 and 4 – 5 years almost above 50 percent. It may be due to the government decisions like demonetization and lockdown.

Table 5.4: Digital Banking Usage Experience

Levels of Experience	Internet Banking		Mobile Banking		UPI-Payments	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Nil	437	65.71	0	0.00	0	0.00
Below 1	69	10.38	261	39.25	122	18.35
1 – 3	20	3.01	207	31.13	283	42.56
4 – 5	93	13.98	106	15.94	115	17.29
Above 5	46	6.92	91	13.68	145	21.80
Total	665	100.00	665	100.00	665	100.00

5.5 Descriptive Statistics

Table 5.5 listed descriptive statistics representing central tendency values. The mean value of all 32 statements ranged from 4.89 to 6.13, which describes all respondents agreeing about the given statements. From skewness and kurtosis statistical measures,

normal distribution of the data can be drawn. The values closer to the “zero” (0) describes the data is normally distributed. Data gathered for this study was normally distributed, because all the values of skewness and kurtosis were between ± 2 as suggested by Hair et al. (2014).

Table 5.5: Descriptive Statistics

Indicators	Mean	Median	STDEV	Skewness	Kurtosis	Shapiro-Wilk
EU1	4.93	5	1.510	-0.462	-0.661	0.920
EU2	5.09	5	1.422	-0.717	-0.205	0.899
EU3	4.95	5	1.477	-0.556	-0.488	0.915
EU4	4.89	5	1.524	-0.529	-0.665	0.910
EU5	4.95	6	1.790	-0.460	-1.160	0.874
PR1	5.08	5	1.568	-0.607	-0.285	0.904
PR2	4.97	5	1.535	-0.556	-0.525	0.914
PR3	5.03	6	1.603	-0.779	-0.377	0.878
PR4	4.94	5	1.665	-0.469	-0.758	0.907
SE1	5.40	5	0.948	-0.483	0.958	0.887
SE2	5.45	5	0.909	-0.884	2.110	0.839
SE3	5.43	5	0.901	-0.682	2.756	0.819
SE4	5.35	6	0.878	-1.154	1.823	0.807
TR1	5.26	6	1.206	-0.800	1.080	0.852
TR2	5.25	5	1.063	-0.530	1.652	0.879
TR3	5.23	6	1.060	-0.886	1.353	0.838
TR4	5.03	5	1.044	-0.674	1.552	0.852
RA1	5.69	6	1.198	-1.212	1.476	0.831
RA2	5.91	6	1.145	-1.412	2.058	0.799
RA3	6.13	6	1.120	-1.630	2.561	0.746
RA4	5.80	6	1.030	-0.912	1.267	0.856
RA5	5.89	6	1.134	-1.313	2.272	0.822
AD1	5.75	6	1.321	-1.201	1.001	0.826
AD2	5.69	6	1.341	-1.083	0.656	0.841
AD3	5.71	6	1.341	-1.179	0.833	0.826
AD4	5.63	6	1.286	-0.876	0.352	0.867
AD5	5.63	6	1.251	-0.878	0.226	0.868
DFI1	5.28	5	1.227	-0.593	0.014	0.910
DFI2	5.48	6	1.293	-0.904	0.622	0.882
DFI3	5.68	6	1.179	-0.994	0.971	0.865
DFI4	5.75	6	1.160	-1.082	0.875	0.842
DFI5	5.09	5	1.497	-0.722	-0.191	0.900

5.6 Multi-Collinearity

Multi-collinearity issue occurs due to the high correlation between predictor variables. Multi-collinearity was not expected between the construct of the model. If the higher correlation between constructs had a substantial impact on the quality of the results, which may not be reliable. Multi-collinearity leads to two types of issues in statistical analysis. First, multi-collinearity increases the standardized error that affects the estimated weights significantly different from zero. Second, multi-collinearity causes incorrect estimation weights and reversing of their signs. Hence, it was essential to assess the level of multi-collinearity that exists between constructs to ensure the reliability of the results.

Variance inflation factor (VIF) was applied in this study to investigate whether multi-collinearity existed. If the VIF values between constructs were below 5 that confirms there was no potential issue of multi-collinearity. The VIF values were, listed in Table 5.6, below 5 confirm there was non-existence of multi-collinearity between constructs in this study.

Table 5.6: VIF Values

Constructs	DFS Adoption	Digital Financial Inclusion	Ease of Use	Perceived Risk	Relative Advantage	Self-Efficacy	Subjective Norms
DFS Adoption		1.705					
Digital Financial Inclusion							
Ease of Use	1.835	2.119			1.000		
Perceived Risk	1.573	1.606					
Relative Advantage	1.216	1.256					
Self-Efficacy	1.148	1.222		1.000			
Subjective Norms	1.132	1.264					

5.7 Common Method Bias

Common method bias denotes “*the extent of spurious covariance associated between variables of the study*”. CMB might appear due to the measurement method used in survey research, which impacts tampering with the quality of results. The data of the study was obtained through a self-designed questionnaire in which all 32 statements were measured on a seven-point Likert scale. Hence, there should be a potential threat of CMB on reliability, validity, and predicting relationships among variables.

Both, procedural and statistical, approaches were adapted to avoid CMB in this study. Enough care had taken while framing the questionnaire statements to avoid ambiguity and interpret the same meaning. As a statistical remedy, Harmons’ single-factor method was adapted to assess the strength of CMB’s impact on results (Podsakoff et al. 2003). Exploratory factor analysis (EFA) was performed without any rotation using Principal axis factoring. The EFA results described there was no issue of CMB in this study (see Table 5.7 and 5.8), and that the single factor has a cumulative variance of 33.1 percent which was below the suggested value of 50 percent (Pavlou et al. 2007).

Table 5.7: Harman's Single Factor Analysis

Factor	SS Loadings	% of Variance	Cumulative %
1	10.6	33.1	33.1

Table 5.8: Single Factor Loadings

Items	Factor	Uniqueness
	1	
RA1	0.533	0.715
RA2	0.468	0.781
RA3	0.381	0.855
RA4	0.392	0.846
RA5	0.39	0.848
EU1	0.728	0.47
EU2	0.681	0.536
EU3	0.664	0.559
EU4	0.697	0.515
EU5	0.691	0.523
SN1	0.444	0.803
SN2	0.495	0.755
SN3	0.414	0.828
SN4	0.452	0.796
SE1	0.395	0.844
SE2	0.329	0.892
SE3	0.35	0.877
SE4	0.347	0.879
PR1	0.405	0.836
PR2	0.453	0.795
PR3	0.443	0.804
PR4	0.417	0.826
AD1	0.778	0.395
AD2	0.773	0.402
AD3	0.803	0.356
AD4	0.628	0.605
AD5	0.698	0.513
DFI1	0.774	0.401
DFI2	0.743	0.449
DFI3	0.706	0.501
DFI4	0.652	0.574
DFI5	0.599	0.642
<i>Note.</i> 'Principal axis factoring' extraction method was used in combination with a 'none' rotation		

5.8 Reliability and Validity

In behavioral research or social science research, a researcher attempts to establish a relationship between variables or to understand human behavior with certain measurement scales. But the big question is how well the measurement scales predict behavior. Hence, assessing the consistency and accuracy of the data gathered for the research is vital in the research. Reliability and validity were essential conditions to perform structural equation modeling. In this study, to establish the reliability and validity of the data obtained from the respondents were assessed with different statistical methods.

5.8.1 Reliability

In statistical analysis, the consistency of the measurement scale to deliver desired results was denoted to as reliability. In other words, the ability of the measurement scales to produce stable results in different contexts and situations. To assess the consistency of the scales adapted for this study evaluated with Cronbach's alpha, rho_A, and composite reliability as suggested by many researchers (Hair et al. 2019).

The results of Cronbach's alpha ranged from 0.852 to 0.958 for the constructs of the study, which were above the threshold values of 0.70 (Bagozzi & Yi 1988). Hence, the reliability of the data was satisfied. In addition to Cronbach's alpha, in recent times Hair et al. (2019) suggested assessing the reliability with composite reliability which was computed based on the standardized factor loadings, and researchers also recommend checking reliability via Rho_A which was computed based on unstandardized factor loadings. To satisfy the composite reliability the values should be above 0.7, the results composite reliability ranged from 0.90 to 0.967. Data

collected for the study satisfied composite reliability. Rho_A was suggested especially where a research model was assessed through PLS-SEM. The computed values of the Rho_A ranged from 0.854 to 0.959, which were also above the required value of 0.70. Therefore, the reliability of the data to measure the intended construct was satisfactory to go for further analysis (see Table 5.9).

Table 5.9: Constructs Reliability and Validity

Constructs	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
DFS Adoption	0.940	0.949	0.954	0.808
Digital Financial Inclusion	0.915	0.923	0.936	0.747
Ease of Use	0.958	0.959	0.967	0.855
Perceived Risk	0.951	0.953	0.964	0.871
Relative Advantage	0.908	0.931	0.931	0.731
Self-Efficacy	0.929	0.940	0.949	0.824
Subjective Norms	0.852	0.854	0.900	0.694

5.8.2 Validity

In statistical analysis, the accuracy of the measurement scales to yield desired results is denoted to as validity. In other words, the ability of the measurement scales to produce accurate results that a researcher intended or expected. The validity of the data for measuring latent constructs of the research model was assessed in two different methods. Namely 1. Convergent validity, and 2. Discriminant validity.

5.8.2.1 Convergent Validity

Convergent validity refers to how well the measurement scales converge to predict the intended latent construct. Convergent validity can be assessed through different statistical methods. Composite reliability, average variance extracted (AVE), and

factor loading were employed to assess convergent validity measurement scales as suggested by Bagozzi & Yi (1988) and Hair et al. (2014).

Table 5.10: Item Loadings

Constructs	Items	DFS Adoption	Digital Financial Inclusion	Ease of Use	Perceived Risk	Relative Advantage	Self-Efficacy	Subjective Norms
DFS Adoption	AD1	0.937						
	AD2	0.938						
	AD3	0.943						
	AD4	0.815						
	AD5	0.853						
Digital Financial Inclusion	DFI1		0.902					
	DFI2		0.900					
	DFI3		0.875					
	DFI4		0.834					
	DFI5		0.805					
Ease Of Use	EU1			0.927				
	EU2			0.925				
	EU3			0.922				
	EU4			0.950				
	EU5			0.899				
Perceived Risk	PR1				0.918			
	PR2				0.949			
	PR3				0.934			
	PR4				0.932			
Relative Advantage	RA1					0.887		
	RA2					0.894		
	RA3					0.820		
	RA4					0.811		
	RA5					0.860		
Self-Efficacy	SE1						0.918	
	SE2						0.914	
	SE3						0.912	
	SE4						0.886	
Subjective Norms	SN1							0.840
	SN2							0.867
	SN3							0.756
	SN4							0.865

Composite reliability established the convergent validity of the data, which was above the recommended threshold value of 0.7 for all constructs of the study. The AVE should be above the value of 0.5 for all constructs of the study, and in addition to that, The AVE values ought to be lower than the values of the corresponding constructs' composite reliability. Hence, the computed values of AVE satisfied convergent validity. It was also assessed through the item loading above 0.7 converged with corresponding intended constructs only. Hence, all three methods confirmed the convergent validity (see Table 5.9 and Table 5.10).

5.8.2.2 Discriminant Validity

The distinctiveness of each construct in the research model is referred to as discriminant validity. Discriminant validity can be assessed through three different statistical methods. Namely 1. Fornell-Lorker's criterion, 2. Heterotrait-Monotrait Ratio (HTMT), and 3. Cross loadings of measurement scales.

Fornell-Lorker's criterion of discriminant validity was assessed based on the standardized factor loadings. To confirm the discriminant validity of the Fornell-Lorker's criterion, the $\sqrt{AVE}$ of constructs must be above the correlation coefficients of the inter-correlation matrix. Table 5.11 pertains to Fornell-Locker's discriminant validity, The table present that all $\sqrt{AVE}$ of the construct in diagonally in bold Italic and correlation coefficients of all constructs presented off diagonally. All $\sqrt{AVE}$ were above the correlation coefficients. Hence, the data of the study enabled establish discriminant validity of Fornel-Locker's criterion.

Table 5.11: Fornell-Larcker Criterion

Constructs	DFS Adoption	Digital Financial Inclusion	Ease of Use	Perceived Risk	Relative Advantage	Self-Efficacy	Subjective Norms
DFS Adoption	0.899						
Digital Financial Inclusion	0.726	0.864					
Ease of Use	0.485	0.428	0.925				
Perceived Risk	0.193	0.148	0.597	0.933			
Relative Advantage	0.331	0.424	0.349	0.136	0.855		
Self-Efficacy	0.346	0.222	0.248	0.193	-0.033	0.908	
Subjective Norms	0.430	0.576	0.198	0.097	0.224	0.242	0.833

Heterotrate-Monotrait Ratio (HTMT) was also a statistical method of assessing discriminant validity. HTMT was assessed using the unstandardized factor loadings. As per HTMT, the discriminant validity confirms when the HTMT values were below 0.9 as suggested by Hair et al. (2017). The values of HMT were presented in Table 5.12 below 0.9. Hence, HTMT criteria of discriminant validity were also confirmed.

Table 5.12: Heterotrait-Monotrait Ratio (HTMT)

Constructs	DFS Adoption	Digital Financial Inclusion	Ease of Use	Perceived Risk	Relative Advantage	Self-Efficacy	Subjective Norms
DFS Adoption	-						
Digital Financial Inclusion	0.772	-					
Ease of Use	0.509	0.454	-				
Perceived Risk	0.204	0.156	0.626	-			
Relative Advantage	0.351	0.450	0.365	0.144	-		
Self-Efficacy	0.361	0.235	0.261	0.202	0.076	-	
Subjective Norms	0.476	0.648	0.218	0.105	0.248	0.271	-

Table 5.13: Cross Loadings

Constructs	Items	DFS Adoption	Digital Financial Inclusion	Ease of Use	Perceived Risk	Relative Advantage	Self-Efficacy	Subjective Norms
DFS Adoption	AD1	0.937	0.692	0.452	0.158	0.317	0.346	0.410
	AD2	0.938	0.713	0.423	0.153	0.298	0.342	0.432
	AD3	0.943	0.722	0.474	0.178	0.300	0.362	0.438
	AD4	0.815	0.537	0.375	0.132	0.301	0.206	0.312
	AD5	0.853	0.573	0.450	0.247	0.278	0.273	0.323
Digital Financial Inclusion	DFI1	0.692	0.902	0.419	0.188	0.389	0.215	0.567
	DFI2	0.693	0.900	0.385	0.134	0.346	0.230	0.535
	DFI3	0.637	0.875	0.372	0.132	0.396	0.182	0.476
	DFI4	0.576	0.834	0.335	0.070	0.393	0.162	0.493
	DFI5	0.515	0.805	0.328	0.105	0.300	0.160	0.401
Ease of use	EU1	0.486	0.426	0.927	0.546	0.353	0.258	0.215
	EU2	0.440	0.393	0.925	0.552	0.340	0.185	0.146
	EU3	0.423	0.362	0.922	0.525	0.304	0.210	0.183
	EU4	0.452	0.392	0.950	0.574	0.304	0.206	0.170
	EU5	0.435	0.401	0.899	0.564	0.309	0.284	0.198
Perceived Risk	PR1	0.182	0.140	0.505	0.918	0.096	0.180	0.074
	PR2	0.189	0.135	0.594	0.949	0.146	0.197	0.112
	PR3	0.184	0.151	0.573	0.934	0.128	0.177	0.117
	PR4	0.162	0.127	0.557	0.932	0.139	0.164	0.055
Relative Advantage	RA1	0.357	0.474	0.358	0.141	0.887	0.016	0.250
	RA2	0.301	0.380	0.322	0.129	0.894	-0.025	0.199
	RA3	0.232	0.301	0.225	0.120	0.820	-0.034	0.183
	RA4	0.262	0.296	0.293	0.079	0.811	-0.054	0.144
	RA5	0.229	0.310	0.260	0.103	0.860	-0.067	0.160
Self-Efficacy	SE1	0.357	0.244	0.242	0.194	0.003	0.918	0.217
	SE2	0.301	0.184	0.192	0.137	-0.087	0.914	0.244
	SE3	0.309	0.197	0.228	0.200	-0.072	0.912	0.202
	SE4	0.277	0.168	0.235	0.162	0.034	0.886	0.219
Subjective Norms	SN1	0.350	0.458	0.153	0.065	0.242	0.154	0.840
	SN2	0.404	0.498	0.174	0.124	0.211	0.251	0.867
	SN3	0.346	0.478	0.143	0.061	0.120	0.189	0.756
	SN4	0.328	0.483	0.187	0.069	0.173	0.205	0.865

Another method of assessing discriminant validity was the examination of cross-loading of the measurement variables. Table 5.13 presented cross-loadings of measurement variables and all of them loaded highly on intended constructs only. The data of the study was confirmed through three methods of the discriminant validity test and supporting further analysis of the structural model.

5.9 Hypothesis Testing

After confirmation of the reliability and validity of variables, research model (hypothesized) relationships were examined with standardized path coefficient (β) and critical value (T-Value) at the significant level of 5 % (P-Values). In the process of decision to either accept or reject the research hypothesis, the T-Value should be ≥ 1.96 at a P-Value of 0.05.

PLS-SEM structural model results portrayed that except for H9 and H12, all other research hypotheses (H1, H2, H3, H4, H5, H6, H7, H8, H10, H11, and H13) were accepted.

Table 5.14: Hypothesis Results

Hypothesis	Relationship	Original Sample (β)	Standard Deviation (STDEV)	T Value ($ \beta/STDEV $)	P Values	Decision
H1	Relative Advantage -> DFS Adoption	0.153	0.042	3.616	0.000	Accept
H2	Relative Advantage -> Digital Financial Inclusion	0.151	0.033	4.532	0.000	Accept
H3	Ease of Use -> DFS Adoption	0.408	0.052	7.798	0.000	Accept
H4	Ease of Use -> Digital Financial Inclusion	0.110	0.041	2.651	0.008	Accept
H5	Ease of Use -> Relative Advantage	0.349	0.041	8.438	0.000	Accept
H6	Subjective Norms -> DFS Adoption	0.279	0.039	7.065	0.000	Accept
H7	Subjective Norms -> Digital Financial Inclusion	0.316	0.033	9.683	0.000	Accept
H8	Self-Efficacy -> DFS Adoption	0.209	0.040	5.263	0.000	Accept
H9	Self-Efficacy -> Digital Financial Inclusion	-0.043	0.026	1.658	0.097	Reject
H10	Self-Efficacy -> Perceived Risk	0.193	0.033	5.805	0.000	Accept
H11	Perceived Risk -> DFS Adoption	-0.140	0.041	3.390	0.001	Accept
H12	Perceived Risk -> Digital Financial Inclusion	-0.059	0.033	1.795	0.073	Reject
H13	DFS Adoption -> Digital Financial Inclusion	0.513	0.034	14.925	0.000	Accept

From the PLS-SEM results (listed in Table 5.14), the adoption of DFS was significantly influenced by relative advantage, ease of use, subjective norms, self-efficacy, and perceived risk. But perceived risk (H9) has a significant negative impact on the adoption of DFS. Relative advantage was significantly influenced by ease of use (H5). Perceived risk was significantly influenced by self-efficacy (H10). Digital

financial inclusion was significantly influenced by relative advantage (H2), ease of use (H4), subjective norms (H7), and DFS adoption (H13). Both self-efficacy and perceived risk were insignificant influences on DFI.

5.9.1 Predictive Power and Relevance

The predictive power of the research model of the study was measured with R^2 , it was popularly called as the coefficient of determination. R^2 value describes the variation in the endogenous variables explained by the exogenous variables in the research model. In other words, the coefficient of determination was the estimation accuracy of the research model. R^2 values fall between 0 to 1, where R^2 values 0.25, 0.50, and 0.75 represents a weak, moderate, and substantial predictive power respectively. This benchmark level of predictive power was used as the rule of thumb in social science research.

R^2 for DFS adoption was 0.414, which represents that all exogenous variables – relative advantage, ease of use, subjective norms, self-efficacy, and perceived risk together explained 41.4 percent of the variation in the DFS adoption. Hence, it concludes that exogenous variables of DFS adoption had model predictive power.

R^2 for DFI was 0.648, which represents that all exogenous variables – relative advantage, ease of use, subjective norms, self-efficacy, perceived risk, and DFS adoption all together explained 64.8 percent of the variation in the DFI. Hence, it concludes that exogenous variables of DFI had substantial predictive power.

Ease of use had a weak predictive power on relative advantage ($R^2 = 0.122$), and self-efficacy also had weak predictive power on perceived risk ($R^2 = 0.037$).

Table 5.15 contains the coefficient of determination (R^2) and predictive relevance (Q^2). Predictive relevance was the measure of the quality of the predictive power. Q^2 values were computed by using the blindfolding procedure in SmartPLS software. Q^2 values of the research model described good predictive relevance. Q^2 for digital financial services adoption was 0.329 and Q^2 for digital financial inclusion was 0.476. The difference between R^2 and Q^2 explains the quality of the predictive power, the lesser difference the higher the quality of the predictive power.

Table 5.15: Predictive and Relevance Analysis

Endogenous Constructs	R^2	Standard Deviation (STDEV)	T-Value ($ R^2/STDEV $)	P-Values	Q^2	$R^2 - Q^2$
DFS Adoption	0.414	0.036	11.402	0.000	0.329	0.085
Digital Financial Inclusion	0.648	0.025	25.721	0.000	0.476	0.172
Perceived Risk	0.037	0.013	2.871	0.004	0.032	0.005
Relative Advantage	0.122	0.029	4.203	0.000	0.085	0.037

5.9.2 Effect Size

Effect size (F^2) refers to the change in R^2 value of all exogenous variables when an exogenous variable was excluded from the research model. In simple words, to assess the impact of the excluded exogenous variable on endogenous variables, whether the impact was either low or medium or substantial. The thumb rule for the evaluation of the effect size – 0.02 was small, 0.15 was medium, and 0.35 was substantial. The effect size listed in Table 5.16 describes that the omission of relative advantage and perceived risk had a small effect on DFS adoption. In a similar manner, omission of ease of use, self-efficacy, and perceived risk had a small impact on DFI. As a concluding remark, the omission of perceived had a small and ignorable impact on the research model.

Table 5.16: Effect Size (F²)

Hypothesis	Relationship	Effect Size (F ²)	Standard Deviation (STDEV)	T-Value (F ² /STDEV)	P-Values
H1	Relative Advantage -> DFS Adoption	0.033	0.019	1.688	0.091
H2	Relative Advantage -> Digital Financial Inclusion	0.052	0.024	2.186	0.029
H3	Ease of Use -> DFS Adoption	0.155	0.046	3.394	0.001
H4	Ease of Use -> Digital Financial Inclusion	0.016	0.012	1.290	0.197
H5	Ease of Use -> Relative Advantage	0.138	0.038	3.617	0.000
H6	Subjective Norms -> DFS Adoption	0.117	0.036	3.244	0.001
H7	Subjective Norms -> Digital Financial Inclusion	0.224	0.050	4.468	0.000
H8	Self-Efficacy -> DFS Adoption	0.065	0.026	2.497	0.013
H9	Self-Efficacy -> Digital Financial Inclusion	0.004	0.006	0.756	0.450
H10	Self-Efficacy -> Perceived Risk	0.039	0.014	2.736	0.006
H11	Perceived Risk -> DFS Adoption	0.021	0.013	1.592	0.111
H12	Perceived Risk -> Digital Financial Inclusion	0.006	0.007	0.842	0.400
H13	DFS Adoption -> Digital Financial Inclusion	0.439	0.074	5.898	0.000

CHAPTER – 6

DISCUSSION AND IMPLICATIONS

Outline of the Chapter

This chapter was designed for discussion on empirical results drawn from statistical analysis and its implications. The impact of each construct of the research model and its alliance with previous studies were discussed. The implications of the study were categorized into theoretical, managerial, and regulatory.

6.1 Discussion

This research study was undertaken to investigate the rural people's perceptions, motivations, and hindering factors of DFS and to investigate the impact of the adoption of DFS on DFI. This section discussed four parts of the survey instrument.

From the demographical section (Section -1), most of the respondents were male. It may be due to the ownership of the smartphones and computers in the family, most male members of the family had a smartphone and very few female members had a smartphone. Further, most of the existing users of digital financial services were qualified as either under-graduate or post-graduate. They might have acquired and shared specific kinds of technological knowledge and abilities. That might be a reason for the adoption and usage of DFS. School and intermediate education levels represent a very low rate of respondents. They lacked knowledge and skill in technology-related awareness, which is why the people who had school and intermediate education represented very low. Most of the existing users were aged between 18 to 45, and these age group people having an interest in the use of innovative technological products.

From the Financial information section (section 2), it was observed that all the respondents had a bank account, 80 percent of the respondents had credit facility at banks, 70 percent of the respondents had subscribed to life insurance, and around half of them had term deposit accounts (56 percent) and pension accounts (44 percent). This financial information portrays that rural people did not have appropriate financial knowledge. Majorly rural people are exposed to saving accounts and loan accounts rather than other financial services.

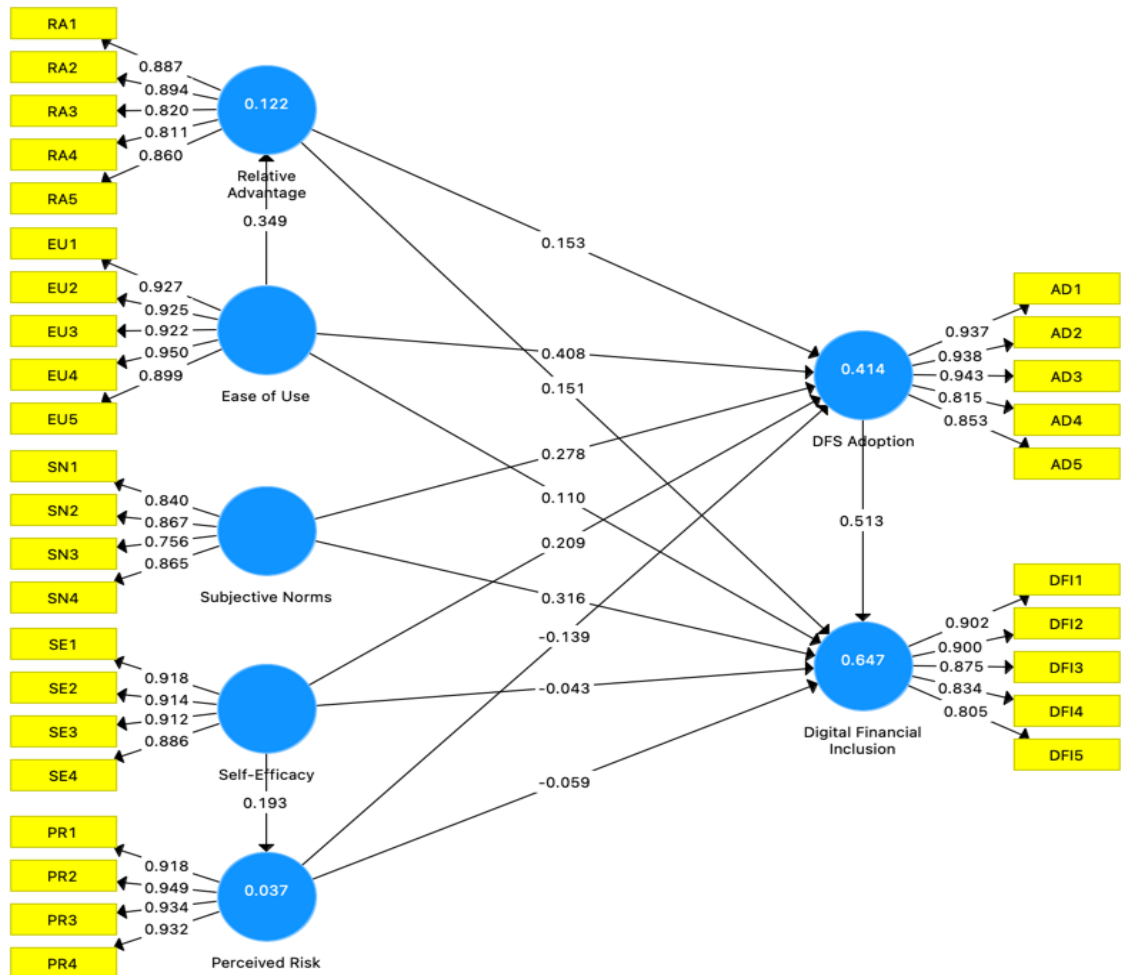
From the technology experience section (section 3), all the respondents had usage experience of smartphone and mobile phone internet. Very few people had computer experience which is also a reason for the low and slow rate of adoption of DFS.

To realize the research objectives, a research model was developed and assessed through the primary data recruited from rural people by employing PLS-SEM via SmartPLS software. These empirical results (see Figure 6.1) identified some of the key determining factors of DFS adoption and DFI. Ease of use and subjective norms were the major that influencing the adoption and continuous use of DFS among rural people.

DFS adoption was positively influenced by subjective norms, relative advantage, ease of use, and self-efficacy. Whereas DFS adoption was negatively influenced by perceived risk. The variance in the adoption of DFS was 41.4 percent, which was a combined effect of all its independent variables.

DFI (continuous use) was significantly determined by ease of use, subjective norms, and relative advantage. Further, DFI was insignificantly determined by perceived risk and self-efficacy.

Figure 6.1: PLS-SEM Results of Research Model



6.1.1 Relative Advantage

The relative advantage was denoted as the extent of benefit derived from the use of DFS compare with other alternatives. It was discovered to have a considerable positive impact on the DFS adoption (H1: $\beta = 0.153$, $T = 3.616$, $P < 0.05$), but a trivial impact

on DFI (H2: $\beta = 0.151$, $T = 4.532$, $P < 0.05$). These findings show that rural residents were deeply concerned about the type of advantage they would derive from using digital banking services.

As a concluding remark, relative advantages derived from DFS played a substantial impact on the adoption and continuous use, the more the benefits yield from DFS the more the acceptance and diffusion of DFS among rural people. This outcome was consistent with earlier research (Adjei et al. 2020; Al-Jabri & Sohail 2012; Akturan & Tezcan 2012; Cruz et al. 2010; Lin 2011; Raju & Lokanandha Reddy 2022; Shareef et al. 2018).

6.1.2 Ease of Use

The ease of use was noted as the extent of physical and mental efforts required to use DFS. From the PLS-SEM results, it was identified that ease of use was a vital factor of the DFS adoption (H3: $\beta = 0.408$, $T = 7.798$, $P < 0.05$) and DFI (H4: $\beta = 0.11$, $T = 2.651$, $P < 0.05$). Furthermore, it was noted the ease of use had a substantial influence on the relative advantage (H5: $\beta = 0.349$, $T = 8.438$, $P < 0.05$).

Therefore, ease of use was one of the crucial factors of DFS. It emphasizes the easiness of operating the system of DFS was an essential element for the rural people, the easiness and fewer efforts needed to operate and knowing how to use DFS can help them gain widespread acceptability and encourage users to utilize them frequently. These results were well crafted with the previous finding (Adjei et al. 2020; Celik 2021; Chawla & Joshi 2017; Deb & Agrawal 2017; Raju & Lokanandha Reddy 2022).

6.1.3 Subjective Norms

Subjective norms were denoted as the extent to which a person's decisions were influenced by their social networks, like – family members, friends, colleagues, social media, and mass media suggestions. Venkatesh et al. (2003) In the evolution of their UTAUT model, subjective norms was renamed as social influence. In this study, subjective norms were found as one of the vital factors in the DFS adoption (H6: $\beta = 0.279$, $T = 7.065$, $P < 0.05$) and DFI (H7: $\beta = 0.316$, $T = 9.683$, $P < 0.05$) among rural people.

The impact of subjective norms describes that generally people's decisions and actions were influenced by their social group. Especially, in the case of the acceptance and usage of innovative digital products, rural people use to consult immediately available experts and knowledgeable people. Rural people were more social and always give priority to relationships which makes them easily influence their decisions and actions. Further, in rural areas availability of technical support and infrastructure was also one of the reasons for the dependence on the opinions of the existing users of innovative products.

Results of the subject norms was well crafted with previous studies (AbuShanab & Pearson 2007; Al-Ajam & Md Nor 2015; Deb & Agrawal 2017; Deb & Lomo-David 2014; Giovanis et al. 2012; Raju & Lokanandha Reddy 2022).

6.1.4 Self-Efficacy

Self-efficacy was denoted as the user's capability and confidence to use DFS. All DFS were self-services that need specific skills to understand and operate efficiently and effectively. The user's competency and ability would depend on previous experience,

prior knowledge, and training. In this study, self-efficacy had a substantial positive impact on DFS adoption (H8: $\beta = 0.209$, $T = 5.263$, $P < 0.05$) and perceived risk (H10: $\beta = 0.193$, $T = 5.805$, $P < 0.05$). It describes that users' ability and confidence were important factors for the adoption and avoiding the potential risk arising from the use of digital products. But self-efficacy had an insignificant impact on DFI (H9: $\beta = -0.043$, $T = 1.658$, $P > 0.097$). Most of the respondents had either under-graduation or post-graduation and had previous experience with mobile phone usage and digital products. It concludes that self-efficacy played a substantial role during the initial stage of adoption, after that people became skilled. The impact of self-efficacy aligned with existing literature (Ahmed & Sur 2021; Amin et al. 2012; Chawla & Joshi 2017; Foroughi et al. 2019; Lin 2011; Raju & Lokanandha Reddy 2022; Susanto et al. 2016; Wang et al. 2003).

6.1.5 Perceived Risk

Perceived risk was denoted as the extent of uncertainty embedded with the usage of DFS. Digital products were embedded with multiple vulnerabilities, like – cyber threats, viruses, cyber-attacks, hacking, etc. Generally, people have certain fears to use technology and innovative products. Adoption of technology might cause social risk, personal risk, performance risk, and financial risk.

Perceived risk had a substantial adverse impact on the adoption of DFS (H11: $\beta = -0.14$, $T = 3.39$, $P < 0.05$). It emphasizes that rural people were much concerned and give priority to the protection of their personal and financial information from cyber-attacks. Sometimes rural people without knowledge might share financial and personal information with strangers, which drives them to cyber vulnerabilities. On the

contrary, financial risk had an insignificant impact on DFI. Which describes that perceived risk can be overcome via proper awareness and experience. Therefore, a conflicting effect on the adoption and sustained use of DFS was caused by perceived risk. The results were aligned with previous findings (Akturan & Tezcan, 2012; Al-Jabri 2015; (Elhajjar & Ouaida, 2019); (A. N. Giovanis et al., 2012); (S. Gupta et al., 2017).

6.1.6 DFS Adoption

DFS adoption was expressed as the acceptance of DFS to initiate and perform financial transactions. In this study, the adoption of DFS was employed as both an independent variable and a dependent variable. The adoption of DFS was substantially influenced by relative advantage, ease of use, subjective norms, self-efficacy, and perceived risk. The variance in DFS adoption was 41.4 percent, which was explained by subjective norms, ease of use, relative advantage, self-efficacy, and perceived risk.

At the same time, DFI was substantially determined by DFS adoption (H13: $\beta = -0.513$, $T = 14.925$, $P < 0.05$). It describes that the acceptance of DFS had a significant impact on accessing and using a wide variety of financial services with digital means. Therefore, it concludes that initial acceptance of DFS enables rural people to access different financial services, like – savings, loan, insurance, pension, etc.

6.1.7 Digital Financial Inclusion

DFI was expressed as the continuous access and use of suitable financial services through digital means by rural people. The research model's PLS-SEM results showed that 64.8% of the variance in DFI was explained. Subjective norms, ease of use,

relative advantage, and DFS adoption were significantly impacting DFI. But self-efficacy and perceived risk had insignificant influence.

Table 6.1: Findings of the study supporting and not supporting previous studies

Constructs	Supporting	Not supporting
Relative Advantage	Adjei, et al. (2020); Akturan & Tezcan (2012); Al-Ajam & Md Nor (2015); Al-Jabri & Sohail (2012); Cruz et al. (2010); Lin (2011); Raju & Lokanandha Reddy (2022); Shareef et al. (2018).	Bashir & Madhavaiah (2015); Chemingui & Lallouna (2013).
Ease of Use	AbuShanab & Pearson (2007); Ahmed & Sur (2021); Al-Ajam & Md Nor (2015); Chawla & Joshi (2017); Deb & Lomo-David (2014); Deb & Agrawal (2017); Giovanis et al. (2012).	Akturan & Tezcan (2012); Al-Jabri (2015); Al-Jabri & Sohail (2012); Amin, et al. (2012); Baabdullah, et al (2019); Bashir & Madhavaiah (2015); Chen et al. (2016).
Subjective Norms	AbuShanab & Pearson (2007); Al-Ajam & Md Nor (2015); Deb & Lomo-David (2014); Deb & Agrawal (2017); Elhajjar & Ouaida (2020); Glavee-Geo et al. (2020), Raju & Lokanandha Reddy (2022).	Alalwan, et al. (2017); Apau & Lallie (2022); Baabdullah, et al (2019); Charag et al. (2020); Chen et al. (2016).
Self-Efficacy	Ahmed & Sur (2021); Amin, et al. (2012); Foroughi & Hyum (2019), Raju & Lokanandha Reddy (2022).	Celik (2008); Shareef et al. (2018).
Perceived Risk	Akturan & Tezcan (2012); Al-Jabri (2015); Al-Jabri & Sohail (2012); Elhajjar & Ouaida (2020); Giovanis et al. (2012); Gupta et al. (2017).	Ahmed & Sur (2021); Chauhan et al (2018); Chemingui & Lallouna (2013); Damghanian et al. (2016); Daud et al. (2011).

6.2 Implications

This study's empirical findings have important contributions to research, industry, and governance for the diffusion of DFS at a desirable level to achieve financial inclusion, an objective of the sustainable development goals of United Nations members was that no one left without access to finance for the development of personal, social, and economic. The contributions of the study were summarized into three broad categories.

6.2.1 Theoretical Implications

This research makes important additions to the field of information systems and financial inclusion. A self-designed research model was used for assessing the role of DFS adoption in financial inclusion. The exogenous constructs proposed in the proposed research model had found essential factors for the adoption and use of DFS. The proposed research model was able to assess the important variables of the adoption and continuous use of DFS among rural customers.

The exogenous constructs of the study were drawn from different well-established information systems theories. All the constructs of the model proved significant in the rural context. Ease of use and subjective norms are the two most influencing variables in the adoption and use of DFS.

Most of the existing studies of digital financial services adoption are investigated in the urban context, but this study addresses the gap in the technology adoption literature. This study helps researchers for the development of more research models to investigate the determining factors of digital financial service adoption and use.

6.2.2 Managerial Implications

The statistical findings of the study have several contributions to the management of financial institutions and information technology firms. The construct ease of use has emerged as a major determinant of DFS adoption among rural customers and was followed by subjective norms and relative advantage.

Hence, the management of financial institutions and software companies must focus on the design and development of user-friendly digital products. Like, as

understanding the content placed in the digital form, mental and physical efforts needed for the usage of digital products.

Generally, rural people in India were not proficient in the English language because it is not their native language. In India, there are multiple regional languages prevailing. The management should focus on the language to design in a regional language that enhances the wide acceptance and use of digital products. In addition to language, management may focus on signs and symbols for easy navigation of websites and mobile applications to enhance the adoption rate.

Rural people are comparatively not much experienced with innovative products and technology. They used to contact relatives, friends, and other available experienced or existing users of the innovative and technology-based products to know about characteristics, benefits, issues, challenges, and usage of the innovative products. Therefore, the management should employ people to create awareness and empower them to the usage of digital products. That improves the confidence and ability of the rural people.

Another important finding of the study was the relative advantage of DFS. Management emphasizes the benefits and advantages of innovative products that can create value for customers. The more the benefits the more the adoption and usage of digital products. DFS helps to perform financial transactions around the clock and across the world, which removes visiting financial institutions and banks, customers can avoid the marginal cost associated with usage and avail of financial services, and customers can monitor financial transactions and activities for efficient management of finance.

Perceived risk was observed as a negative impact on the adoption of DFS. It is suggesting that management should implement appropriate and sophisticated security mechanisms to establish trust among the rural people in DFS. Because technology is always blended with different kinds of cyber vulnerabilities, that could be addressed by providing appropriate grievance mechanisms.

6.2.3 Regulatory Implications

The results of the study also assisting for regulatory bodies like governments and central banks in designing financial inclusion policies and drafting, implementing, and monitoring information technology legal framework. The perceived risk construct has been found significant negative effect on the adoption of DFS, which shows that rural people be afraid to use DFS. The risk embedded with the digital channel causes the loss of money and financial and personal information in the digital world. Generally, rural people have little amounts of earnings, that was making people protect their hard earnings from cyber threats. Hence, government and central banks must implement stringent legal protection and vigilante the digital financial services users to ensure faith and trust in the digital channels and banks and financial institutions. Government and financial institutions should empower the customers and potential customers to motivate and encourage the use of financial services via the digital channel.

CHAPTER – 7

CONCLUSION

Outline of the Chapter

This chapter was designed for discussing the conclusion drawn from the empirical results, the Limitations of the study, and the scope for future research.

7.1 Conclusion

The notion of financial inclusion was developed due to unequal availability and usage of financial services, which have been causing several vulnerabilities in society. Like poverty, unemployment, inability to lead a quality life, lack of access to quality products, health issues, regional imbalance, financial instability, etc. Therefore, finance is an essential element for personal, social, and economic development.

Governments, banks, and financial institutions have been focusing on and drafting policies to bring all sections of the people into the formal net of the financial system. Formal financial services help people protect against risks arising from the subscription to informal finance, which drives people to face financial vulnerabilities. But formal financial services providers like banks and financial institutions were established in urban areas and very few were operating in rural and semi-rural areas. Hence, many rural people were away from the subreption of financial services.

Rapid advancement in information technology and its wide applications had changed the landscape of the business and its operations, especially in the services sector, causing for development of e-commerce and m-commerce business models. Information technology-enabled business firms and customers to interact with each

other virtually to change sources and information. Banks and financial institutions are able to design and development of multiple products and delivery channels to engage customers and meet their demands through information technology.

Online banking, mobile banking, and mobile payments enable banks and financial institutions to reach and serve rural people where the establishment of branch offices is not viable. Though digital delivery channels were the potential to serve effectively and efficiently for all customers. but the adoption of DFS was in its infancy among rural customers. Therefore, this study was undertaken to investigate the determinant variables of DFS and their role in accessing and using of different financial services.

The proposed research model of the study explained 64.8 percent of the variance in financial inclusion and 41.4 percent of the variance in DFS adoption. The exogenous variables of the study – relative advantage, ease of use, subjective norms, self-efficacy, and perceived risk were established as essential factors of DFS adoption. The DFS adoption was established as a critical element of financial inclusion.

DFS play a vital role in achieving financial inclusion at a desirable level, enabling rural people to avail and use different financial services to meet their financial needs and objectives of the rural people. For instance, requests for credit, saving in term deposits, subscription to insurance products for protecting from risk, etc.

Ease of use, subjective norms, and relative advantage are the essential facilitating factors of DFS adoption and continuous use. Whereas perceived risk was portrayed as a substantial negative predictor of DFS adoption, which may cause the pausing and drop in the usage of DFS. Banks and financial institutions should empower customers

about risks embedded with digital delivery channels and how to protect from them. Self-efficacy is also one of the factors that influence to DFS adoption.

From frequency analysis of the respondents' demographic profile, it concludes that most of the DFS users are either post-graduation or under-graduation education. Due to higher education, the present users can understand and operate DFS. It is also observed from the demographic profiles most of the current users are young people aged between 18 to 45. Yet, in rural areas, there is a gender gap in the acceptance and usage of DFS, which may be due to ownership of the smartphones. In rural areas, most of the male members in a home have smartphones rather than women.

7.2 Limitations of the Study

Like any other research study, this study also suffers from different limitations.

- The research model was designed with a total of seven variables. Five exogenous variables –ease of use, relative advantage, subjective norms, self-efficacy, and perceived risk were the very limited number of determinants. There were many other antecedents of the adoption and usage of digital financial services.
- Samples of the study were recruited using convenience and snowball sampling methods, which were non-probabilistic sampling techniques. All the respondents were belonging to the state of Andhra Pradesh. Hence, the results suffer from generalizability.
- The study's target population was the current users of digital financial services, which may not represent the whole rural population. The findings of the study might be different for potential and non-users.

- The findings of the study were relying on the cross-section data.

7.3 Scope for Future Research

- The researcher may investigate the research model in other states and other countries.
- The researchers may use probabilistic sampling methods to generalizability of the results.
- The researchers may include an additional number of variables in the research model used in the study.
- The researchers may include both current users and non-users to better understand the rural people's views of DFS adoption.
- The researcher can investigate the research model with help of longitudinal data.
- The researcher can investigate the comparative studies between urban and rural users to explore the key variables of the DFS that are common between them.

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Annexure 1: Survey Instrument

Gosala Raju,
Research Scholar.



Under Supervision of:
Dr. Irala Lokanandha Reddy,
School of Management Studies,
University of Hyderabad,
Hyderabad, Telangana, India.

Section 1 Demographic Profile

1. Name (optional): _____

Please tick '✓' mark for the following questions

2. Gender: i. Male [] ii. Female []
3. Age (in Years): i. 18 – 25 [] ii. 26 – 35 [] iii. 36 – 45 [] iv. 46 – 55 []
v. above 55 []
4. Education: i. School [] ii. Intermediate [] iii. Undergraduate []
iv. Postgraduate [] v. Others []
5. Occupation: i. Daily wage. [] ii. Farming [] iii. Business []
iv. Looking for job [] v. Job [] vi. Student []
6. Average Monthly Income: i. Below 5,000 [] ii. 5,001 – 10,000 []
iii. 10,001 – 15,000 [] iv. 15,001 – 20,000 []
v. 20,001 – 25,000 [] vi. Above 25,000 []
7. Marital status: i. Unmarried [] ii. Married []
iii. Separated [] vi. Widow []

Section 2

Financial information

1. I have savings bank account: Yes [] No []
2. I have term deposit account: Yes [] No []
3. I have loan account: Yes [] No []
4. I have pension account: Yes [] No []
5. I have life insurance policy: Yes [] No []

Section 3

Technology and Digital banking experience

1. Ownership of Computer: Yes [] No []
2. Ownership of Smartphone: Yes [] No []

3. Computer usage experience (in Years):

- i. Nil [] ii. Below 1 [] iii. 1 – 3 [] iv. 4 – 5 [] v. Above 5 []

4. Smartphone usage experience (in Years):

- i. Nil [] ii. Below 1 [] iii. 1 – 3 [] iv. 4 – 5 [] v. Above 5 []

5. Internet Usage Experience (in Years):

- i. Nil [] ii. Below 1 [] iii. 1 – 3 [] iv. 4 – 5 [] v. Above 5 []

6. Internet Banking (website) Experience (in Years):

- i. Nil [] ii. Below 1 [] iii. 1 – 3 [] iv. 4 – 5 [] v. Above 5 []

7. Mobile Banking (App) Experience (in Years):

- i. Nil [] ii. Below 1 [] iii. 1 – 3 [] iv. 4 – 5 [] v. Above 5 []

6. BHIM-UPI Experience (in years):

- i. Nil [] ii. Below 1 [] iii. 1 – 3 [] iv. 4 – 5 [] v. Above 5 []

Section 4

Following statements are designed for the assessment of research hypothesis and measured on seven-point scale.

(Where, 1 = strongly disagree, 2 = moderately disagree, 3 = disagree, 4 = neither disagree nor agree, 5 = agree, 6 = moderately agree, and 7 = strongly agree)

S. No.	Statements	1	2	3	4	5	6	7
1	Digital financial services are convenient to manage finance.	1	2	3	4	5	6	7
2	Digital financial services allows me to manage finance efficiently.	1	2	3	4	5	6	7
3	Digital financial services allows me to manage my finance effectively.	1	2	3	4	5	6	7
4	Digital financial services gives greater control over finance.	1	2	3	4	5	6	7
5	Digital financial services improves financial wellbeing.	1	2	3	4	5	6	7
6	Digital financial services are easy to use.	1	2	3	4	5	6	7
7	Digital financial services are easy to understand.	1	2	3	4	5	6	7
8	Digital financial services are easy to operate.	1	2	3	4	5	6	7
9	Digital financial services are user-friendly.	1	2	3	4	5	6	7
10	Digital financial services facilitates for easy accomplishment of financial transactions.	1	2	3	4	5	6	7
11	My friends and family members suggested me to use digital financial services.	1	2	3	4	5	6	7
12	My bank staff suggested me to use digital financial services.	1	2	3	4	5	6	7
13	Media advertisements influenced my decision to use digital financial services.	1	2	3	4	5	6	7
14	It is trend of using digital financial services, hence I am using.	1	2	3	4	5	6	7
15	I would not feel safe providing personal information over internet for digital financial services.	1	2	3	4	5	6	7
16	I am worried to use digital financial services because other people may be able to access my account.	1	2	3	4	5	6	7
17	I am worried to use digital financial services because network failure causes for loss of money.	1	2	3	4	5	6	7

18	I am afraid of using digital financial services because digital services have potential risk from hackers and malwares.	1	2	3	4	5	6	7
19	I can use digital financial services without anyone's help.	1	2	3	4	5	6	7
20	I can use digital financial services by following manual.	1	2	3	4	5	6	7
21	I can use digital financial services if someone assist at once.	1	2	3	4	5	6	7
22	I have confidence to use digital financial services.	1	2	3	4	5	6	7
23	I adopted digital financial services for balance enquiries and bank statements.	1	2	3	4	5	6	7
24	I adopted digital financial services for remittances.	1	2	3	4	5	6	7
25	I adopted digital financial services for paying bills.	1	2	3	4	5	6	7
26	I adopted digital financial services for e-commerce (online purchases).	1	2	3	4	5	6	7
27	I adopted digital financial services for request and repayment of loan.	1	2	3	4	5	6	7
28	Digital channels allows me to access and use of suitable financial products.	1	2	3	4	5	6	7
29	Digital channels enabled me to access and use of financial services at anytime and anywhere.	1	2	3	4	5	6	7
30	Digital channels enabled me to explore different financial services.	1	2	3	4	5	6	7
31	Digital Channels allows me to manage finance effectively.	1	2	3	4	5	6	7
32	Digital channels enables me to track my financial activities.	1	2	3	4	5	6	7

Annexure 2: Papers Presented in Conferences and Papers Published

Papers Presented at Conferences

1. A paper titled “Digital Financial Inclusion in India” was presented at the National E-Conference on ‘Advanced in Business, Management & Technology’ (NCABMT-2021) held on 25th & 26th June 2021 organized by Department of Management Sciences, Mahatma Gandhi University, Bihar.
2. A paper titled “Key Determinants of Digital Financial Inclusion in India” was presented at the International Conference on ‘Sustainable Indian Economic Development in the COVID-19 Influenced World Economic Scenario” held on 18th & 19th November 2021 organized by Department of Economics, Arumugam Pillai Seethai Ammal College, Tamil Nadu.
3. A paper titled “Smartphone: A latest means for Financial Inclusion” was presented at the 2nd International conference on ‘Emerging Trends and Challenges in Modern Business Management (ICETCMBM-2022)’ held on 17th & 18th May 2022 organized by Research and Development Cell, Kamadhenu Arts and Science College, Tamil Nadu.
4. A paper titled “Hindering factors of mobile banking adoption” was presented at AICTE sponsored National E-Conference on ‘Digital Innovations and Business Transformations – The era of new normal [DIBTNN – 2022]’ held on 1st & 2nd June 2022 organized by College of Management, SRM Institute of Science and Technology, Chennai, Tamil Nadu.

Papers Published

1. Gosala Raju & Irala Lokanandha Reddy (2022). Mobile bank use by Rural students. Journal of Algebraic Statistics. Vol. 13, Issue 1.
2. Gosala Raju & Irala Lokanandha Reddy (2022). Use of UPI payments in the Informal Sector: An Indian Context. AIMS Journal of Management, Vol. 8, Issue 1.
3. Gosala Raju & Irala Lokanandha Reddy (2022). Mobile Banking and Financial Inclusion: The proximate determinants of adoption in Rural India. Journal of Management & Entrepreneurship, Vol. 16, Issue 3.

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