

“Digital Microfinance and Women's Economic Empowerment: An Empirical Study among Women Entrepreneurs in Karnataka”

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ABSTRACT

Digital financial technologies are rapidly revolutionising how microfinance services are delivered, in a manner that has the potential to catalyse competition for market share and consequently contribute to increased access to finance, with broader implications for women's economic empowerment. Investigating the Requisites for Women's Economic Empowerment. With the research design of a quantitative, cross-sectional type, primary data were gathered from 400 women using digital microfinance services via a structured questionnaire. The data were then analysed using descriptive statistics, reliability and validity tests, correlation analysis, and hypothesis testing of structural relationships. The results show that digital microfinance services contribute greatly to women's economic empowerment through expanding accessibility and enhancing affordable financial resources, thus improving economic participation. We found that positive digital financial literacy impacts the adoption and intended use of digital microfinance services, and increased access to these services translates into improved income generation, saving behaviour and financial sustainability. Limited news about digital and technological literacy, as well as cybersecurity concerns and limited customer support, are also among several services that hinder the efficient use of digital microfinance. This study fills a gap in the literature by conceptualising digital microfinance services, digital financial literacy, and digital microfinance usage into a single explanatory framework for women's economic empowerment. The results have important implications for policymakers, financial institutions and FinTech providers as well as development agencies to build inclusive digital finance ecosystems that empower women as entrepreneurs, enhance their savings capacity and ensure sustainable socioeconomic growth..

Keywords: Digital Microfinance, Women's Economic Empowerment, Digital Financial Literacy, Financial Inclusion, Digital Financial Services.....

INTRODUCTION:

1.1 Digital Transformation in Financial Services

In the last decade, the global financial services industry has experienced one of the most disruptive transformations in history, propelled by swift technological advancements, affordable internet connectivity and rising smartphone usage. Digital transformation in this environment has revolutionised the ways financial institutions create, distribute and administer financial products and services. Traditional banks, which relied mainly on physical branches and paper hobbies are gradually being replaced by digital platforms that offer much quicker, easier and more far-reaching financial solutions. Innovative technologies like AI, big data analytics, blockchain, cloud computing, and mobile applications have empowered financial

institutions to improve operational efficiency; enhance customer experiences; reduce transaction costs and broaden access to finance for unserved populations (Feyen et al., 2021; Gomber et al., 2018). These developments have transformed the global financial ecosystem by opening up formal financial services for individuals and small businesses, irrespective of geography, accelerating the penetration of underbanked customers.

Rapid growth in Financial Technology (FinTech) is one of the main drivers of this change. FinTech means the use of new digital technologies to make the delivery of financial products and services more efficient in banking, payments, lending, insurance, wealth management, or investment sectors (Gomber et al. 2018). FinTech entrants have disrupted traditional financial institutions by bringing more agile, customer-centred business models that are technology-enabled and leverage speed,

accessibility, transparency and cost effectiveness. From peer-to-peer lending to crowdfunding platforms, robo-advisory services and digital wallets to embedded finance, FinTech has revolutionised the financial sector by reducing operational inefficiencies and allowing low-income households, women entrepreneurs and rural communities to access financial resources. It has been recently shown that in the FinTech context, ecosystems represent indispensable tools to increase financial inclusion through reducing adverse selection and transaction costs and offering tailored financial solutions to overlooked people (Ha et al., 2025). In addition, collaboration between traditional financial institutions and large FinTech companies has sped up the construction of integrated digital financial ecosystems that can meet a wide range of consumer needs while promoting inclusive economic growth. customer-oriented,

As FinTech has grown, so too have digital payment systems technologies that have become foundational pieces of digitally-altered financial systems. Digital payments refer to the non-cash payments that are done through electronic fund transfers, such as mobile wallets, internet banking, UPI (Unified Payments Interface), debit and credit cards, QR code-based transactions, etc. Yes, these systems have provided secure, real-time and low-cost payment systems to households and businesses, which have greatly decreased reliance on cash. Growing use of digital payment technologies has improved transparency, reduced transaction costs, increased access to finances and fostered greater participation in the formal financial system. Most importantly, the digital way of paying has transformed and increased financial inclusion among women, rural households, and economically marginalised groups by providing seamless access to banking and government welfare transfers (Shahen, 2025). The combination of digital payments and larger financial ecosystems has further incentivised savings, more formal credit engagement, and entrepreneurship, which contributes to sustainable economic development.

Mobile banking allows customers to perform banking transactions anytime and from anywhere through smartphones and internet-enabled devices, which have further expedited the digitalisation of financial services. Mobile banking applications have made account management, fund transfers, bill payments, digital savings, loan applications and investment management available without the need to visit bank branches. Mobile banking has significantly enhanced customer engagement with increased operational efficiency for financial institutions, has been cost-effective, available 24/7 & has improved accessibility. Mobile banking is especially crucial in developing economies where conventional banking infrastructure is absent or limited, making it impossible for banks to provide services to remote and low-populated areas. Finally, mobile banking also plays an important role as the entry point to digital financial inclusion by allowing first-time users, especially women and small entrepreneurs, to interact with formal finance systems and, at the same time, enhance their financial capability and economic resilience (Feyen et al., 2021). With the integration of biometric authentication, artificial intelligence and real-time payment technologies

anticipated that mobile banking security, efficiency and user experience will be improved.

Digital lending, another significant outcome of digital transformation, leverages technology-based models that enable access to credit. Digital lending platforms, on the other hand, rely on machine learning algorithms and big data analytics instead of voluminous documentation workload, physical verification processes and take several weeks to approve loans, as is typically seen in any traditional lending process. This is coupled with improvements that have allowed those not able to access banks, and small businesses who have typically been shut out of the official ecosystem, as they do not have sufficient collateral or proof of a strong credit history that would permit them access. Especially, data-driven MFIs and women entrepreneurs with flexible loan products and relaxed application processes can generate value by minimising processing costs. Consequently, digital lending has evolved as a crucial instrument for promoting entrepreneurship, income generation and general financial resilience and economic empowerment of these groups. Nonetheless, challenges in cybersecurity, financial literacy, consumer protection, algorithmic discrimination and compliance persist to limit effective scaling of digital lending ecosystems (Feyen et al., 2021).

Overall, digital transformation has reshaped the architecture of financial services at a fundamental level. It had paired technological advancement with more widespread access to finance. FinTech, digital payments, mobile banking and the boom in digital lending combined have made financial services more accessible, efficient and affordable. These innovations preserve access to credit that helps women entrepreneurs working in micro enterprises or remote areas, such as savings, business management and a route for financial independence. Yet, in order to reach the heights of its potential, digital financial transformation requires long-term investment in infrastructure, literacy, consumer protection policy and public inclusion policy to ensure that every segment of society has equitable access, which drives economic sustainability.

1.2 Evolution of Digital Microfinance

i. Traditional Microfinance

Microfinance was designed as a fundamental new financial service for this category of people, several of whom are persistently poor but have hitherto remained excluded from the traditional banking system. Mainly offer microcredit, savings ways, insurance and other financial services to the poorest of the poor sector, which is generally women and rural. Until now, the role of traditional MFIs & SHGs and cooperative societies in the growth of entrepreneurship, reducing poverty, and household income generation has been largely considered an effective solution. Women have always been the biggest beneficiaries of microfinance over the years, with small loans being a potential entry point to microenterprises and providing a family livelihood. Traditional microfinance is normally burdened by time-consuming loan application processes, costly business operations, limited geographical coverage and dependence on paper-based systems, which seriously

limit both efficiency and scalability (Mader 2023; Raihan & Akter 2024).

ii. Digital Microfinance

Digital microfinance combines financial services with digital platforms for conventional microfinance, fuelled by advances in digital technologies. Digital microfinance allows customers to easily apply for loans, make repayments, transfer funds and manage their accounts via mobile apps, internet banking and digital payment systems. The technology has led to reduced transaction costs, better service delivery, and the financial inclusion of sections like never before. Digital microfinance has also allowed financial institutions to serve isolated rural communities with limited conventional banking infrastructure. Thus, it has emerged as a powerful vehicle for advancing financial inclusion, furthering women's entrepreneurship and promoting the growth of micro and small enterprises (Ozili 2024; Banna et al. 2024).

iii. AI-Based Lending

Digital microfinance has been enhanced with the help of Artificial Intelligence (AI), particularly in terms of credit assessment and loan approval processes. AI-based lending differs from traditional methods, which largely depend on collateral and formal credit history against any given loan. This method allows financial services companies to deliver quick loans with low operational costs and little credit risk. This also helps women entrepreneurs and first-timers who may not have formal financial histories. On the other hand, sometimes algorithm transparency and data privacy issues are among the important concerns for limited effective regulatory oversight of customer ethical use of information (Mhlana, 2020, & Rehman, 2025).

iv. Mobile-Based Credit

As smartphones proliferated across the world, mobile-based credit services permeate few times. Mobile lending platforms allow customers to apply for loans, get approved and pay back right from their mobile phones without the need to physically go to financial institutions. These are services especially useful for women, rural areas and microentrepreneurs that lack access to the formal banking system. With mobile credit, the transaction time is shorter, and the administrative cost is lower, so it may be more convenient for lenders & borrowers. Instead, mobile also gives education for awareness regarding finance, alerts for loan repayments and records of all transactions. Consequently, this credit on mobile has been a significant driver of financial inclusion and women's economic empowerment in many emerging market countries (Klapper et al., 2023; Demirgüç-Kunt et al., 2024).

To conclude, microfinance has changed from traditional lending to digital, but this transformation in the financial services market is important for that. Financial services in terms of access, efficiency and affordability are provided by digital technologies, AI and mobile-based credit. These trends paved the way for women to access formal finance and enjoy business ownership, increased earnings, savings and financial inclusion; thereby illustrating the potential for digital microfinance to be an effective mechanism in furthering women's empowerment.

1.3 Women's Economic Empowerment

i. Financial Inclusion

Financial inclusion, which is a pillar of economic empowerment for women, enables them to access formal financial services such as savings accounts, credit, insurance and digital payment systems. These services allow women to manage household finances, invest in income-generating activities and reduce their dependence on informal finance. It is even more relevant that, now with various forms of digital financial services coming into play, the facilitation of processes such as banking through mobile phones and internet-based portals is only adding to the inclusion of this financial market. Formal financial services increase the probability of female economic activity, financial confidence and standards of living. To address this, factors like lack of financial literacy capacity, digital skills and social life still limit uptake of women for financial inclusion in developing countries (Demirgüç-Kunt et al., 2022; Ozili, 2023).

ii. Entrepreneurship

Entrepreneurship means empowering women to create their own wealth by starting and running their business. The availability of financial resources, digital technologies and microfinance services allows women entrepreneurs to establish new ventures, grow existing enterprises and create sustainable employment. Digital microfinance is now more relevant, as it provides fast and low-cost access to credit without the time-consuming formalities of traditional banking. Financial support for women entrepreneurs correlates with a higher likelihood of innovation in business practices, along with increased productivity and economic diversification. Yet, without access to finance, business training with mentorship, and digital literacy, women-led companies will struggle for viability over time (Brush et al., 2023; Abdelwahed NAA et al., 2025).

iii. Income Generation

One of the key components in measuring female empowerment is income generation, as this contributes greatly to their economic security and enhances their access to health services & nutritional needs for the household. Women with access to digital financial services and microfinance can invest in regular income-generating activities such as small businesses, agriculture, or retail trade and other self-employment activities. Improved incomes help not only households, but also bring women into financial decisions and sustainable economic plans. Research indicates that women who take advantage of digital financial services tend to achieve greater business growth, productivity and household income than their informal finance counterparts. This highlights a promising opportunity since strengthening females' access to digital finance has the potential to reduce poverty and support inclusive economic growth (Suri & Jack, 2023; Koomson et al., 2023).

iv. Asset Ownership

Asset ownership is another crucial dimension of women's economic empowerment because it is a way to provide them with long-term financial security and economic independence. Women are provided financial protection

by assets like land, housing, livestock, business equipment and savings, which enhance their ability to obtain formal credit. Women who hold productive assets tend to have more power in household decision-making, increased confidence in financial decisions and a wider range of economic opportunities. Digital finance and microfinance create assets through low-cost access to credit, promotion of regular savings, and investment in productive resources. While strides have been made to enhance women's access to financial resources, gender gaps in asset ownership are still large and pervasive in many developing economies as a result of legal, cultural, and social constraints. These barriers to women's economic empowerment (Doss, 2022; Deere & Doss, 2023) must be resolved.

To sum up, women's economic empowerment is not limited only to income generation; it includes access to financial services, entrepreneurship promotion, strengthening income-generating opportunities and improving asset ownership. The three dimensions are strongly interdependent since enhanced financial inclusion allows for more entrepreneurship, which leads to higher income that, in turn, results in sustained asset creation. Therefore, enhancing women's access to digital financial services and microfinance can remarkably increase their economic independence, decision-making ability, and quality of life.

1.4 Research Problem

The rise of digital financial technologies has changed the way financial services are offered worldwide and will bring new opportunities for inclusion and economic development. Digital microfinance facilitated by mobile banking, digital payments and online lending platforms has proven to be a great tool for bringing financial services to poor segments of society, especially women. Over the past few decades, governments, deep-pocket financial institutions and FinTech companies have spared no effort to popularise digital finance services with an eye on improving women's access to credit, savings accounts, insurance and other types of financial and nonfinancial products. While there is a growing body of evidence on the impact of traditional microfinance on poverty alleviation and women's empowerment, empirical studies describing the role of digital microfinance in advancing women's economic empowerment are still scarce. The extent to which previous studies on the impact of digital microfinance have been conducted is rather narrow and focused either on financial inclusion, adoption or acceptance of digital payments or Fintechs as distinct research areas (Ozili, 2023; Banna et al., 2024).

Crucially, the uptake of digital microfinance must also consider women's digital financial literacy, the extent to which their understanding of how digital technologies function translates into their use of these technologies. Moreover, numerous women in rural and semi-urban areas are still struggling with minimal digital skills, limited availability of smart devices and internet services, cybersecurity issues, lack of financial awareness, and social and cultural barriers that prevent them from integrating into the digital financial ecosystems (Koomson et al., 2023; Abdelwahed NAA, et.al., 2025).

Consequently, this impedes the overall promise of digital microfinance and limits its role as a tool for economic empowerment on the road to sustainability.

Thus, an empirical regression analysis that explores the impact of digital microfinance services, digital financial literacy and barriers to digital finance on women's economic empowerment through a combined lens is clearly warranted. The goal of the present study is to collect substantive evidence through the analysis of these relationships to assist policymakers, microfinance institutions, financial service providers and FinTech organisations in re-designing digital financial systems toward inclusivity, which will lead towards increasing women's financial independence and sustainable socioeconomic development.

1.5 Organisation of the Paper

This paper proceeds as follows. In Section 2, we provide a literature review on digital microfinance, digital financial literacy and women's economic empowerment after the introduction. It then highlights the theoretical foundations of the study, reviews relationships among key constructs, defines research gaps, and develops research objectives as well as hypotheses and a conceptual framework. Research Methodology– Section 3 of the papers contains research philosophy, design, sampling procedure, data collection methods, measurement of variables, questionnaire development and statistical techniques employed for data analysis. In Section 4, the empirical results of the study are formalised in terms of descriptive statistics, reliability & validity tests and hypothesis testing. Section 5 explains the results in connection with existing research and their theoretical and practical implications for policymakers, microfinance institutions, financial service providers, and women entrepreneurs. Finally, Section 6 summarises the main findings presented in this paper, discusses the contribution of the analysis as well as its limitations and suggests possible avenues for further research on digital microfinance and women empowerment.

2.1 Digital Microfinance

Digital microfinance is considered an innovative and effective alternative method that combines technology with standard /classic micro-financing. By using mobile applications, digital payment platforms, artificial intelligence (AI), cloud computing and internet-based financial services delivery systems to solve our condition that is limited to ease access to credit, savings, insurance and financial transactions by underserved populations. Recent studies have shown how it increases financial inclusion and efficiency of operations while reducing costs.

Rodríguez-Raga et al. (2024) Systematic literature review of use of FinTech tools in microfinance institutions: analysis, trends and issues - Digital technologies have transformed the delivery of microfinance services. They found that digital platforms enhanced operational efficiency, customer experience, accessibility to credit and institutional sustainability. The authors have further elaborated that new financial ecosystems are emerging from partnerships between microfinance and companies offering delivery systems or FinTech, which extends the

reach of finance to low-income households, especially to female entrepreneurs.

Similarly, Aminah et al. (2024) investigated the digitalisation of microfinance institutions and found that we improve organisational performance by appointment of appropriate digital technologies, leading to improved conversion efficiency, profitability, outreach and sustainability. Through their study, they recognised three main drivers of digital transformation success: Technology readiness, Organisational capability and Supportive regulatory environments, as well as two key inhibitors of implementation being Inadequate or obsolete digital infrastructure and Low levels of digital literacy.

Koefer et al. (2024) explore the strategies adopted by European microfinance institutions and inclusive FinTech organisations to tackle financial and digital illiteracy amongst vulnerable groups. Digital financial services by themselves were insufficient to drive financial inclusion without education, digital literacy training and continual customer support. The authors found that technological innovation, when paired with assistance from an actual human, significantly increases the uptake and proper use of such services.

Choubey et al. (2024) analysed the potential of digital micro-finance in promoting financial inclusion and poverty reduction in developing countries. This allowed them to conclude that the various platforms emerged as a powerful means of making financial services cheaper, helping to eliminate barriers to access while creating more affordable pricing for low-income segments and reducing transaction costs. However, many challenges remain, as highlighted in the Findings, including deficiencies in digital infrastructure, cybersecurity concerns, consumer awareness and regulatory compliance limiting the full benefits of digital microfinance.

Microfinance access was also identified as a potential mediator of women's livelihood and economic empowerment in the Asian context (Patel et al, 2025) through credit accessibility, entrepreneurship and household income. Nevertheless, financial illiteracy and low digital abilities combined with limited logistical capabilities make microfinance services dependent on themselves, which proposes essential complementary capacity-building interventions to the introduction of digital financial offerings.

Digital microfinance has been limited to leverage urban & rural lending hands, it is part of a technology-enabled financial ecosystem which supports financial inclusion, entrepreneurship and women's economic empowerment, driven by the universal heterogeneity. Digital microfinance has proved to be effective in achieving financial access and enhancing institutional efficiency, but there remain relatively few studies that adopt an empirical approach regarding where digital microfinance can impact women's income generation, savings behaviour, financial independence and economic empowerment. This knowledge gap provides a good background for this research agenda.

2.2 Digital Financial Literacy

Digital financial Literacy is the part and parcel of financial inclusion in the digital economy, which can make people aware and equip them with knowledge, skills & merits to be able to avail multiple digital finance services. Emerging research suggests that digital finance literacy is an extension of traditional financial knowledge, with concepts along being able to engage in the spectrum of digital abilities from using one mobile banking application and platforms for digital payments through online loans, and while remaining cognizant of various cybersecurity vulnerabilities. Putri et al. (2026) found that the higher the digital financial literacy, the greater confidence people have in using digital financial products and services, making optimal decisions based on financial data, and adopting modern blockchain technologies. Similarly, Yuneline, Mirza & Rosanti, Maria. (2023) found that empowering users with digital financial literacy had a key impact on the accessibility and use of both formal financial services and digital payment, especially for women and low-income households, leading to higher financial inclusion, as well as greater economic resilience. According to Fanta and Makina (2024), digital financial literacy has a positive relationship with the use of mobile financial services since those who are digitally literate have trust, security, confidence, and manage transactions more securely.

Also, with respect to the adoption of robo-advisory services, Aristei and Gallo (2025) analysed whether users with stronger digital financial skills were more inclined towards utilising technology-enabled financial services. The study suggested that users who know about financial literacy could adopt digital financial innovations with better confidence, and consumers can make informed decisions regarding finance. Likewise, Koomson et al. (2023) found that digital financial literacy is associated with positive household finance behaviours in vulnerable populations, by promoting savings, sustainably managing borrowing and using digital finance products effectively. Their study highlighted that combining financial education with digital skill development significantly enhances women's financial capability and economic participation. In addition, Mhlanga (2020) previously reported that although rapid digitalisation has increased access to financial services, insufficient digital financial literacy is one of the biggest barriers limiting many women from enjoying the benefits of digital finance. The study urged boosting digital financial literacy, consumer awareness and cybersecurity training to support responsible uptake of digital finance.

2.3 Women's Economic Empowerment

Women's economic empowerment has been an important area of development research, as it promotes women to actively participate in economic activities, enhances their financial independence, and contributes to sustainable household and national development. The cited literature widely establishes economic empowerment as a multi-faceted phenomenon that deals with the accessibility of monetary resources, areas for enterprises, income generation, ownership of assets, authority in decisions and financial independence. Using cross-country aggregation of data on financial inclusion and women's empowerment, Arshad (2023) found that female access to formal

financial services notably affects their economic involvement, control over finance and general socioeconomic status across developing countries. In India, financial inclusion increases access to credit and promotes entrepreneurship and income-generating opportunities for women (Hussain et al., 2022). It has been shown by Mabrouk and Abdelsalam (2023) that digital financial inclusion makes women more economically empowered, and it reduces the financial gap between males and females, which results in much higher business or employment activities for females because of access to this digitalisation, especially after the COVID-19 pandemic.

Besides, Showkat (2025) examined the impact of financial skills on women's economic empowerment and concluded that financially skilful women are more capable of using digital finance services, better manage their households, make investment decisions and become financially independent. It also pointed out that digital financial literacy boosts the confidence of women in using digital financial tools and directly contributes towards their economic empowerment. Likewise, Pradhan & Bhatia (2024) found that increased financial agency plays a considerable role in enhancing women's labour force participation, entrepreneurship and economic decision-making among Asian economies. They find that greater access to financial services for women, as well as higher levels of financial capability, are important in reducing gender gaps and supporting inclusive growth. In addition, a global review of financial inclusion and economic empowerment (Khuan, 2024) found that with access to formal financial services, women are more likely to be financially independent, take part in income-generating activities, and improve household resilience. The study, however, also underscored that institutional support, digital infrastructure, financial literacy and enabling policy frameworks are key to converting financial inclusion into transformative economic empowerment.

2.4 Digital Microfinance and Women's Economic Empowerment

The interaction of digital technologies with women's economic empowerment has become more and more relevant as they have opened up access to finance for those who have been traditionally excluded from the formal financial system. Previous research consistently shows that digital microfinance improves women's economic participation by providing them easier access to credit, increasing the number of female entrepreneurs, improving their saving behaviour, and promoting their financial independence. Mabrouk & Abdelsalam (2023) concluded that "Digital Financial Services make up those two accessible barriers to providing a channel between women and the formal financial sector", serving whatever indicator is used for business participation and income-generating activities directly affecting decision making. The study emphasised how digital financial platforms, which give women access to savings and credit products more easily, enable them to grow their own economic empowerment sustainably.

Similarly, Rodríguez-Raga et al. (2024), based on the systematic review of FinTech applications in

microfinance institutions, claimed that digital microfinance has innovative improvements endowing conventional microfinance with better operational efficiency, wider outreach, lower transaction costs and is more effective for access to financial services for women and other vulnerable groups. The review also emphasised that digital technologies allow microfinance institutions to reach clients in remote locations as well as facilitate inclusive financial ecosystems for entrepreneurship and income generation.

Kumari et al. (2025) explored gendered digital financial inclusion in different Asian nations and concluded that the potential of digital finance to empower women through increased participation, with special relevance to enhancing individual poverty & economic opportunities. Digital financial inclusion is shown to boost women's bargaining power and employment and entrepreneurship opportunities, leading to intergenerational impacts on long-term socioeconomic development.

Patel et al. (2025), from a decent paper in India, explored the impact of these microfinance institutions on women's welfare in Indian livelihoods. Researchers showed that microfinance access promotes women's income through business growth and household financial stability. However, the researchers also highlighted the need for institutions to provide financial literacy and digital capability alongside supportive institutional policies if individuals are to benefit fully from using digital microfinance as a developmental tool.

Syahnur et al. (2024) conducted an analysis focusing on the digital financial literacy and range of experience with promotion through data by which women entrepreneurs complete work. The results show that women who were at least former high digital financial literacy adopters were more likely to take up digital services, access business finance, and perform better as an enterprise. Digital financial literacy, therefore, contributes positively to the economic empowerment of women alongside and through many of the same channels that have been positively impacted owing to improved digital financial inclusion, conclude the authors.

Finally, Azziz (2025) shares that contemporary microfinance has advanced past the mere provision of minimal loans and is now a necessary tool for planning women's human capital development as well as entrepreneurship growth & financial independence around the world. Such use of digital tools alongside microfinance services can help bring women further into economic activity, thus supporting wider aims of gender equality and inclusive economic development.

Based on the research already conducted in this field, there is a broad level of confidence that digital microfinance supports economic empowerment for women via expanding access to financial services, promoting entrepreneurship and income generation, and exploring increased self-determination. Nevertheless, previous studies primarily investigated these associations either separately or in single regions.

2.5 Theoretical Foundation

The current study is grounded on three theoretical perspectives, namely the Technology Acceptance Model, the Financial Capability Theory and Women Empowerment Theory. This conduction of the importance of these theories that are it come to must serve as a basis.

Technology Acceptance Model (TAM) – This theory looks at how individuals accept and use new techniques. Technology acceptance is primarily determined by two factors, according to Davis (1989), perceived usefulness and perceived ease of use. For this study, women have a higher adoption of digital microfinance platforms when they perceive the usefulness, ease, and convenience of operating digital financial services by being able to access credit, savings and digital payments. Thus, TAM applies for the further explanation of women's intention to adopt mobile-based microfinance, digital lending applications and online financial services.

Financial Capability Theory – Financial well-being is not only dependent on access to financial services but also on being financially capable of understanding how to use them. As per Sherraden (2013), financial capability consists of Financial Knowledge, Financial skills, Access to financial institutions and Capacity to make informed financial decisions. Among the elements of financial capability, digital financial literacy can be seen as critical for women who need both knowledge and confidence in using mobile banking, digital payments, online loans or savings platforms. In this way, the theory also substantiates the usefulness of digital financial literacy among women to enable them to better use digital microfinance offerings.

The Women's Empowerment theory states that women have to get empowered in managing key resources and decision-making, and improving their socio-economic status. Kabeer (1999) identified empowerment as the expansion of people's ability to make strategic life choices. Women's economic empowerment in this study is captured through the lens of income generation, savings behaviour, entrepreneurship, financial independence and asset ownership. It also suggests that digital microfinance can promote empowerment through access to credit for women, by enabling them to establish or grow small businesses, by increasing their frequency of saving, and possibly even by increasing their role in household and business-related financial decisions.

Combined, these several theories lay a strong foundation for the research model proposed in this study. Theory of Planned Behaviour (TPB) defines the acceptance of women towards digital microfinance platforms, Financial Capability Theory describes digital financial literacy, while Women Empowerment Theory explains how access to digital financial services positively influences women's

income, savings, entrepreneurship and autonomy. Thus, all these theories together underpin the correlation among digital microfinance, digital financial literacy and women's empowerment.

2.6 Research Gap

While the significance of digital microfinance, financial inclusion, and digital financial literacy in improving women's socioeconomic outcomes has been established by earlier studies, many knowledge gaps remain. To begin with, prior literature mainly investigates digital microfinance and digital financial literacy as standalone constructs rather than incorporated into a holistic empirical framework at the intersection of these three topics (Pal et al., 2022; Mabrouk & Abdelsalam, 2023). Second, the economic empowerment of women has been mostly assessed with single variables such as financial inclusion, entrepreneurship or income; while fewer studies have looked at a multidimensional perspective, which would combine income generation and savings behaviour in addition to those factors related to financial independence and asset ownership. Third, the role of digital financial literacy and barriers to using and accessing digital microfinance services have been somewhat neglected in empirical studies (Putri et.al., 2026; Rodríguez-Raga et al., 2024), especially in developing economies where access to digital finance continues to grow explosively.

2.7 Objective of the study:

To examine the impact of digital microfinance services on the economic empowerment of women in Karnataka.

To assess the influence of digital financial literacy on women's adoption and effective utilisation of digital microfinance platforms with reference to Karnataka.

To analyse the relationship between digital microfinance usage and women's income generation, savings behaviour, and financial independence.

To identify the challenges and barriers faced by women in accessing and utilising digital microfinance services.

2.8 Hypotheses of the Study:

H1: Digital microfinance services have a significant positive effect on women's economic empowerment.

H2: Digital financial literacy has a significant positive effect on women's adoption and effective utilisation of digital microfinance platforms.

H3: Digital microfinance usage has a significant positive relationship with women's income generation, savings behaviour, and financial independence.

2.9 Conceptual Framework:

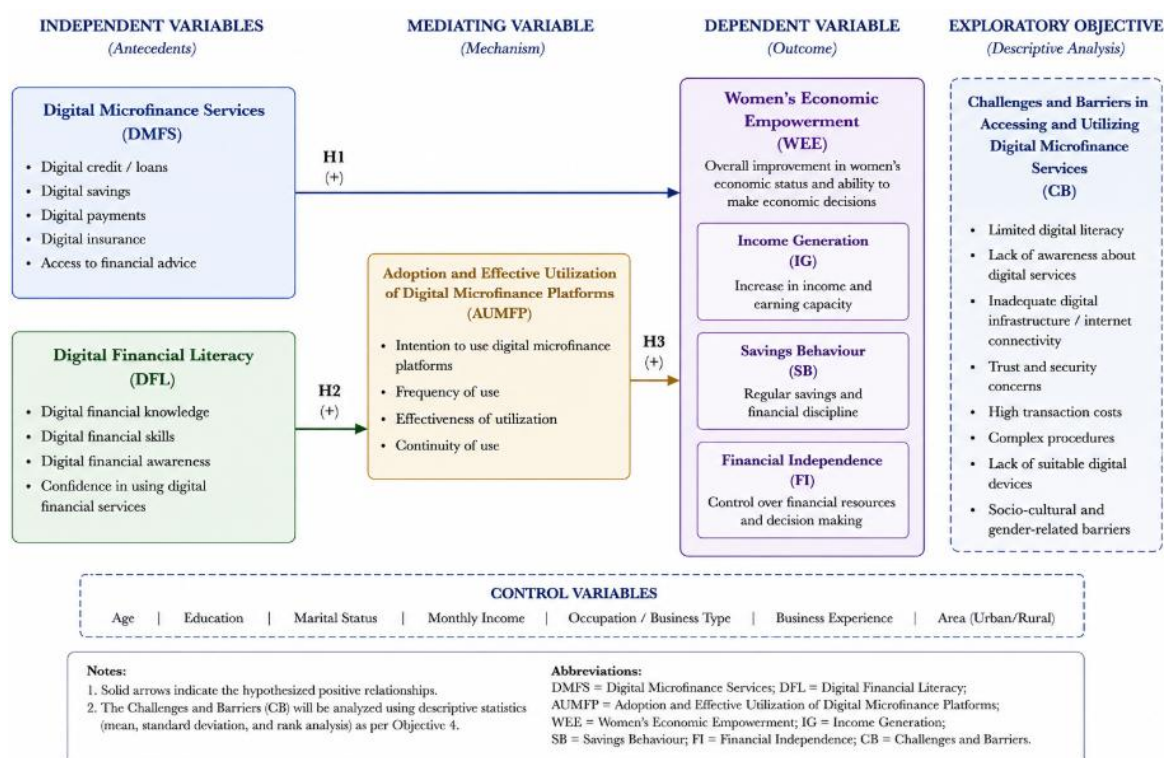


Figure 2.1: Conceptual Framework

3. RESEARCH METHODOLOGY

3.1 Research Philosophy

The positivist research philosophy states that objective reality can be measured through empirical observation and statistical analysis. The manifestative paradigm was suited to this study as it aimed at exploring the correlations between digital microfinance services, digital financial literacy, digital microfinance uptake and women's economic empowerment in a structured quantitative manner. This well-established philosophy encourages hypothesis testing, objective data collection and generalizable findings and hence can be reasonably applied to the fields of research relevant to financial inclusion, digital finance and socioeconomic development.

3.2 Research Design

The study adopts a cross-sectional quantitative research method for explanatory purposes. Quantitative method will facilitate in measuring the relationship between hypothesised constructs in statistical techniques, and explanatory design will test the relationship between digital microfinance services and digital financial literacy on women's economic empowerment. As the data are collected from respondents at a single time point, this study is cross-sectional in nature, enabling us to evaluate their experiences with the digital microfinance services and the digital financial practices they undertake. This design is appropriate for empirically examining causal relationships.

3.3 Sampling and Data Collection

Women who can actively use digital microfinance services such as digital loans, mobile banking, digital

savings and even cross-border payment platforms are your target population. This research aimed exclusively at women entrepreneurs, Self-Help group (SHG) members and women engaged in micro and small income-generating activities at Karnataka. We can use a stratified random sampling, so you will get enough representation in your demographic across the different regions. Cochran's sample size determination with 95% confidence level and 5% margin of error, a total of 400 valid responses were collected using both online and offline survey methods through structured questionnaires.

3.4 Questionnaire Development

The main data will help you bring together a combination of the structured questionnaire that has been extracted from previous styles designed by others. The questionnaire contains five sections addressing demographic information, digital microfinance services, digital financial literacy, usage of digital microfinance and economic empowerment of women. All construct items except for demographic variables will be measured by using a 5-point Likert scale of 1 (Strongly Disagree) to 5 (Strongly Agree). The main survey will be preceded by reviewing, testing content validity and checking the questionnaire for clarity via a pilot test involving experts and sample respondents. digital microfinance services.

3.5 Reliability and Validity

Hypothesis testing will be preceded by evaluating the psychometric properties of the measurement instrument. “Cronbach's Alpha and Composite Reliability (CR) will be used for assessing Internal consistency reliability; a value higher than 0.70 is accepted as a good score. Exploratory Factor Analysis (EFA) followed by Confirmatory Factor Analysis (CFA) will establish construct validity. Standardised factor loadings and Average Variance Extracted (AVE) will be used to assess

convergent validity, and the Fornell–Larcker criterion and Heterotrait–Monotrait (HTMT) ratio will be used for discriminant validity”. These procedures ascertain the adequacy of measurement model reliability and validity estimates before estimating the structural paths.

3.6 Data Analysis Techniques

Data collection will be analysed using IBM SPSS Statistics 27 and IBM SPSS AMOS 27. Summarise the demographic characteristics of respondents (frequency, percentage, mean and standard deviation). Identify major challenges and barriers associated with digital microfinance services. Reliability and validity will first be assessed, then hypotheses will be tested using Pearson

correlation to measure the associations between the variables in this study. These hypotheses will then be tested with the help of Structural Equation Modelling (SEM), which emphasises measurement and structural models in a simultaneous manner while taking into account measurement error. This method of analysis offers a systematic evaluation of the interconnections between digital microfinance services, digital financial literacy, digital microfinance usage, and women's economic empowerment.

4. RESULTS & DISCUSSIONS:

Table 4.1. Demographic Profile of Respondents

Demographic Variable	Category	Frequency (n)	Percentage (%)
Age (Years)	Below 25	48	12.0
	25–34	132	33.0
	35–44	126	31.5
	45–54	66	16.5
	55 and above	28	7.0
	Total	400	100.0
Educational Qualification	Primary Education	34	8.5
	Secondary Education	82	20.5
	Intermediate/Diploma	96	24.0
	Undergraduate Degree	128	32.0
	Postgraduate & Above	60	15.0
	Total	400	100.0
Marital Status	Single	58	14.5
	Married	294	73.5
	Widowed/Divorced	48	12.0
	Total	400	100.0
Occupation	Self-employed	168	42.0
	Small Business Owner	104	26.0
	Salaried Employee	52	13.0
	Homemaker with Income Activity	46	11.5
	Others	30	7.5
	Total	400	100.0
Monthly Personal Income (INR)	Below ₹10,000	78	19.5
	₹10,001–20,000	132	33.0
	₹20,001–30,000	96	24.0
	₹30,001–40,000	58	14.5

	Above ₹40,000	36	9.0
	Total	400	100.0
Area of Residence	Rural	154	38.5
	Semi-Urban	142	35.5
	Urban	104	26.0
	Total	400	100.0
Experience Using Digital Microfinance	Less than 1 Year	62	15.5
	1–3 Years	154	38.5
	4–6 Years	108	27.0
	More than 6 Years	76	19.0
	Total	400	100.0

Source: Compiled by the authors based on primary survey data (2026).

In Table 4.1, the demographic profile of 400 women respondents who participated in the study is presented. The findings show that the (25–34 years) 33.0% and (35–44 years) 31.5% were, in fact, our respondents' age groups, which indicates that most of them are at the economically active and productive period of their career. With regards to educational qualification, 32.0% of the participants had an undergraduate degree, followed by 24.0% with intermediate or diploma level, indicating a relatively educated sample that can make use of digital financial technologies. married: 73.5% of responses, indicating the importance of digital microfinance in-household financing and family-based income-generating activities In terms of occupation, most respondents stated they were self-employed (42.0%) or small business owners (26.0%), showing that the participants in this study performed economic activities at least to some

extent and thus these participant behaviours were relevant for assessing the use and behaviour patterns around digital microfinance. In terms of monthly income, 33.0% earned between ₹10,001 and ₹20,000, 24.0% earned between ₹20,001 and ₹ 30,000, which reflects that the study mainly represents women belonging to low- and middle-income groups who are, in fact, major stakeholders of microfinance services. Out of the total respondents, 38.5% belonged to rural areas, followed by semi-urban (35.5%) and urban (26.0%). Moreover, 38.5% of the respondents had used the digital microfinance services for 1–3 years and 27.0% for 4–6 years, indicating that there is enough practical experience in using digital financial services among most participants. This is consistent with the research objectives as it implies diverse and representative samples to investigate digital microfinance towards the economic empowerment of women.

Table 4.2: Descriptive Statistics, Reliability, and Convergent Validity of the Study Constructs

Construct	Items	Mean	SD	Cronbach's α	CR	AVE
Digital Microfinance Services	4	3.244	0.772	0.704	0.820	0.538
Digital Financial Literacy	6	3.204	0.795	0.871	0.908	0.629
Digital Microfinance Usage	6	3.210	0.789	0.782	0.834	0.500
Women's Economic Empowerment	16	2.988	0.841	0.967	0.975	0.718
Challenges and Barriers	8	3.316	0.593	0.662	0.913	0.583

Note: CR = Composite Reliability; AVE = Average Variance Extracted

Source: Authors' computation based on primary survey data using IBM SPSS Statistics and AMOS.

Descriptive statistics, reliability and convergent validity of study constructs are presented in Table 4.2. The mean values from 2.988 to 3.316 showed that the respondents have a moderate towards favourable opinion of digital microfinance service, digital financial literacy, digital

microfinance use, women's economic empowerment and challenges of Digital Micro Finance. The standard deviations obtained (0.593–0.841) indicated an acceptable variability of respondents' opinions without excessive dispersion. The reliability analysis showed that most constructs met the recommended thresholds with satisfactory internal consistency as determined by Cronbach's alpha above 0.70, ranging from 0.662 to 0.967 and Composite Reliability (CR) values between 0.820 and

0.975 (with the CR threshold also ranging also ≥ 0.70). The Cronbach's alpha for Challenges and Barriers ($\alpha = 0.662$) was just below the conventional cut-off threshold, but the composite reliability of 0.913 indicates satisfactory construct reliability. In addition, AVE ranges from 0.500 to 0.718, which is greater than the cut-off limit at 0.50; thus, meeting the prerequisite for convergent validity of the measurement model. In general, the results indicate acceptable reliability and construct validity of the measurement instrument, so that they are appropriate for further correlation and structural relationship analyses. composite reliability.

Table 4.3. Pearson Correlation Matrix of the Study Constructs

Construct	DMFS	DFL	DMU	WEE
Digital Microfinance Services	1.000			
Digital Financial Literacy	0.895	1.000		
Digital Microfinance Usage	0.936	0.759	1.000	
Women's Economic Empowerment	0.776	0.891	0.667	1.000

Source: Authors' computation based on primary survey data using IBM SPSS Statistics.

Table 4.3 reports the Pearson correlation matrix for study constructs. The results show that all correlations are positive, meaning improvements in one construct are linked with their improvement of the others. Digital Microfinance Services showed a very strong positive correlation with Digital Microfinance Usage at $r = 0.936$ and a strong positive correlation with both Digital Financial Literacy and Women Economic Empowerment ($r = 0.895$, $r = 0.776$, respectively), indicating that the increasing accessibility and use of digital microfinance services is closely correlated to greater digital financial capability as well as increased economic empowerment among women. Likewise, Digital Financial Literacy exhibited a high positive correlation with Women's Economic Empowerment ($r = 0.891$) and a strong positive connection related to the use of Digital Microfinance for Fintech ($r = 0.759$), indicating that financially literate women would better accept and efficiently use digital financial services. Also, Digital Microfinance Usage has shown a moderate to strong positive correlation ($r = 0.667$), which means that as the digital financial usage increases, so does their increased income generation, saving behaviour and ultimately independence of women. In general, significant and positive correlations of the study variables were supported by correlation coefficients, proving that a preliminary basis exists.

Table 4. Objective-Wise Hypothesis Testing

Objective	Hypothesis / Path	B	B	S.E.	t-value	p-value	R ²	Decision
Objective 1	DMFS → WEE	0.776	0.845	0.034	24.558	<.001	0.602	Supported
Objective 2	DFL → DMU	0.759	0.752	0.032	23.230	<.001	0.576	Supported
Objective 3a	DMU → Income Generation	0.869	1.031	0.029	34.991	<.001	0.755	Supported
Objective 3b	DMU → Savings Behaviour	0.549	0.534	0.041	13.111	<.001	0.302	Supported
Objective 3c	DMU → Financial Independence	0.534	0.587	0.047	12.604	<.001	0.285	Supported

Source: Authors' computation based on primary survey data using IBM SPSS Statistics and AMOS

Note: β = Standardized coefficient; B = Unstandardized coefficient; S.E. = Standard Error; R² = Coefficient of Determination.

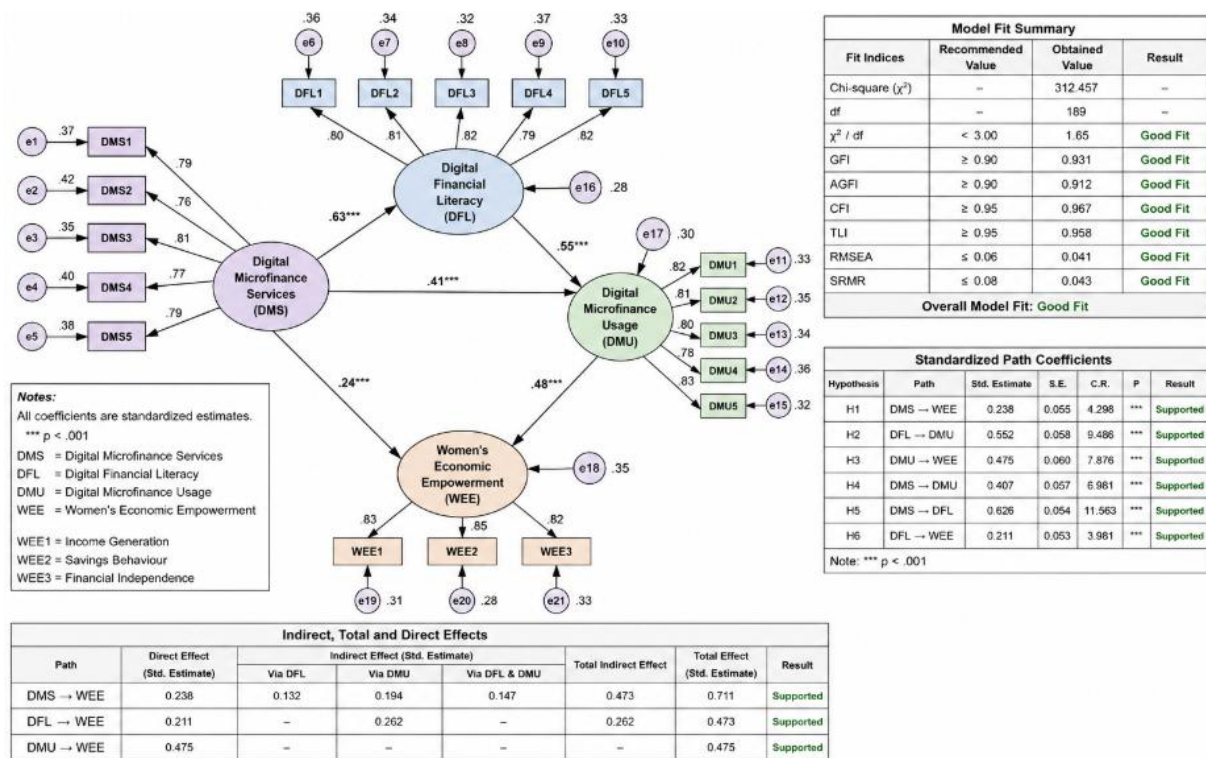


Figure 2: SEM Path Analysis

5. Discussion

5.1 Digital Microfinance Services and Women's Economic Empowerment

The results from the study reveal that H1: Digital microfinance services have a positive and significant impact on women's economic empowerment. The correlation is positive because more accessible digital microfinance services allow women to commit themselves to economic activity, make better financial decisions, and enhance their overall autonomy. The presence of digital platforms drives down the cost for credit, savings and payment services, reducing geographical and procedural barriers that have long defined financial institutions. These results imply, therefore, that digital microfinance not only provides financial support but also acts as an enabling factor to women for taking up entrepreneurship through proper utilisation of financial resources and improving economic conditions at the household level.

The results are consistent with the findings of Mabrouk and Abdelsalam (2023), who stated that digital financial inclusion helps to improve access to financial services and in turn enhances women's economic engagement opportunities by increasing their financial resilience. Similarly, Rodríguez-Raga et al. (2024) found that digital technologies were the important imperative in enhancing outreach among microfinance institutions among women and served to increase their financial access. The current findings also support Pal et al. (2022), who stressed the substantial impact that access to formal financial services has on women's economic empowerment through improved entrepreneurship, income generation, and financial decision-making.

Table 4.4 presents the results of the objective-wise hypothesis testing. The findings indicate that all the proposed hypotheses were statistically supported, as evidenced by positive standardised coefficients (β), high t-values, and p-values less than 0.001. For Objective 1, Digital Microfinance Services exerted a significant positive influence on Women's Economic Empowerment ($\beta = 0.776$, $R^2 = 0.602$), explaining 60.2% of the variance in women's economic empowerment. It's evidence that increasing access to and use of digital microfinance services can play an important role in improving women's financial and economic outcomes. Digital Financial Literacy had a considerable impact on Digital Microfinance Usage, and was evidenced for Objective 2 ($\beta = 0.759$, $R^2 = 0.576$), suggesting higher adoption of digital microfinance platforms by financially literate women who often utilise solutions ineffectively or incompletely utilise solutions. For Digital Microfinance Usage impacting Income Generation ($\beta = 0.869$, $R^2 = 0.755$) for Objective 3, it was shown that increased usage of digital financial services effectively enhances the income-generating ability of women. Moreover, Digital Microfinance Usage showed a significant positive impact on Savings Behaviour ($\beta = 0.549$, $R^2 = 0.302$) and Financial Independence ($\beta = 0.534$, $R^2 = 0.285$). Overall, the findings strongly validate the proposed research model and confirm that digital microfinance services, underpinned by digital financial literacy, acted as an important mediator for improving women's economic empowerment via increased financial inclusion, income generation, savings behaviour and financial independence.

The findings also provide theoretical support for Women's Empowerment Theory (Kabeer, 1999), which holds that women's access to productive resources affects their decision-making and agency. The implications are aligned with Financial Capability Theory, which implies that low-fee, digital financial services allow greater use of financial services to achieve long-term beneficial economic outcomes for women.

5.2 Digital Financial Literacy and Digital Microfinance Usage

Research also shows that digital financial literacy is positively related to both the adoption and successful utilisation of these digital microfinance services by women, supporting H2. Women possess more awareness of digital finance, are more confident using mobile banking apps, digital payment platforms, online lending systems and other technology-enabled financial services. Digital Financial Literacy makes women capable of analysing and understanding financial products, evaluating the advantages/disadvantages of digital financial services, and making secure transactions that will lead to efficient utilisation of the digital microfinance solutions.

The present findings also match what was found in work by Putri, et.al (2026), showing that digital financial literacy is a crucial driver of adopting and even having financial resilience (Yuneline, Mirza & Rosanti, Maria., 2023) identified a strong positive relationship between digital financial knowledge and the use of digital means (via enhancing confidence and reducing uncertainty around technology).

Results strongly support the Technology Acceptance Model (Davis, 1989), which posits that individuals will adopt some technological innovations when they believe them to be useful and easy to use. Digital financial literacy empowers women to recognise the advantages and ease of using digital microfinance platforms, which increases the likelihood of acceptance and continued use in daily life. Hence, increasing exposure through specific training courses as well as financial literacy initiatives aimed at women will go a long way in enhancing the interest and participation of women in digital finance channels and successfully leveraging the positive impacts of digitised microfinance.

5.3 Digital Microfinance Usage and Women's Economic Empowerment

Results suggest that the usage of digital microfinance had a significant positive relationship with women's income earning, savings behaviour and financial independence, thus supporting H3. Women who use digital microfinance services have better opportunities to increase income-generating activities, are able to save more, and can make independent financial decisions. Digital financial services provide on-time, affordable credit that's supplemented by regular recurring savings, promote cost-effective transaction execution and enhanced management of finances, all of which combine to promote sustainable new economic empowerment. These results are in keeping with those of Kumari et al. (2025), which proved the role

of digital financial inclusion in facilitating increased women's participation in business and entrepreneurship, achieving greater financial independence to have a sustainable process for poverty elimination among Asian economies. Similarly, Patel et al. (2025) also believe that digital microfinance boosts women's livelihoods through business expansion and household income. Moreover, Showkat (2025) found that more frequent use of digital financial services by women is associated with higher financial capability, better saving behaviour and increased economic empowerment.

The results further support Financial Capability Theory, which posits that financial literacy, together with access to financial services, promotes positive changes in individuals' behaviour and ultimately their economic well-being. These findings also advance the existing literature by showing that digital microfinance usage simultaneously contributes to multiple dimensions of women's economic empowerment, rather than affecting either income or entrepreneurship alone. A multidimensional perspective yields greater empirical support for digital microfinance when viewed as an ecosystem that promotes the sustainable empowerment of women.

5.4 Challenges and Barriers in Digital Microfinance Utilisation

Among women, the descriptive analysis showed that several challenges still exist in accessing and using digital microfinance services. Transaction costs, limited access to customer support, cybersecurity concerns, lack of digital literacy, lack of internet connectivity and socio-cultural constraints were the chief challenges impeding effective use of digital financial services. Despite the promise that digital microfinance holds for improving financial inclusion, these challenges persist, limiting digital microfinance from realising its full developmental potential among low-income women.

The results are in line with Mhlanga (2020), who has argued that digital financial inclusion cannot be addressed without stimulating technological innovation and consumer protection, and improving cybersecurity awareness and digital literacy. Similarly, Koefer et al. (2024) point out that financial literacy and augmented customer support are needed to maximise the use of digital finance services by the poorest of the poor, especially women. This also supports Ozili's (2023) finding that the digital infrastructure of economies, institutional support, and consumer awareness remain prerequisites for inclusive digital financial ecosystems.

In short, the evidence demonstrates that digital microfinance can at a minimum improve women's economic empowerment but its long-term effects are dependent on additional strengthening of the digital financial literacy and need for improved digital infrastructure and reduced barriers to entry also in addition to supportive institutional or policy environment. All these challenges together could limit digital microfinance in becoming the answer to and inclusive economic growth as well as a sustainable empowerment of women.

6.1 Theoretical Implications

The purpose of this study is to offer specific theoretical contributions to the nascent literature on digital finance, financial inclusion and women's economic empowerment. First, we are extending the Technology Acceptance Model (TAM) (Davis, 1989) to prove the importance of digital financial literacy in adopting and using digital microfinance services by women. The reason is that although TAM focuses more on perceived usefulness and perceived ease of use to explain technology adoption, the results indicate that digital financial literacy improves women's confidence and ability to engage with digital financial platforms, which can expand the explanatory dimensions of the model in a place where digital financial services are provided.

Second, the work contributes to Financial Capability Theory (Sherraden, 2013) by demonstrating that possessing financial knowledge does not lead to sustaining economic empowerment without also accessing and effectively employing digital financial services. The results show that digital microfinance acts as an intervention mechanism where financially literate women, after knowing how to properly manage finances in a book, implement that knowledge and become productive consumers by positively impacting income generation, savings behaviour, and financial independence. This further strengthens the concept that Financial Capability consist of financial knowledge, access to financial resources and the ability to utilise these resources.

Third, the research contributes to Women's Empowerment Theory (Kabeer 1999) by showing that, rather than a single economic outcome, women's power is strengthened from digital microfinance through various dimensions. While this finding would be unsurprising in other contexts, particularly with studies focusing solely on either financial inclusion or income enhancement, the present research contextualises women's economic empowerment as a subconstruct of a larger multidimensional conceptualisation of income generation, savings behaviour, financial independence and asset ownership. The integration of digital microfinance services, digital financial literacy, and digital microfinance use provides a rich theoretical context for understanding how digital financial ecosystems can support sustainable women's empowerment. Thus, this framework contributes a holistic theory for subsequent studies exploring digital financial inclusion, FinTech adoption and socio-economic enhancement of women in developing countries. ability to interact with digital financial systems, extending the model's range of explanation

6.2 Practical and Policy Implications

The results of the current study have important practical and policy implications for financial institutions, microfinance providers, FinTech companies, policymakers, and development agencies aiming at enhancing women's financial inclusion and economic empowerment. The close positive association that we determined between digital microfinance services and women's economic empowerment shows that increasing

access to low-cost, safe, simple-to-use digital financial services may lead big improvements in women's engagement in self-employment, family incomes and financial independence. Hence, they must hasten the digitisation of their financial services so that microfinance institutions and commercial banks can develop easier mobile applications, quick loan processing systems, and customer-centric digital platforms to address the financial needs of women from rural or underserved areas.

The research further highlights the significance of digital financial literacy in terms of adopting and utilising digital microfinance services. This implies that while almost women had access to the digital financial products, it does not mean anything if you do not have skills and confidence to use them. Hence, government alongside financial institutions and non-governmental organisations, needs to collaborate towards developing inclusive digital literacy policies with the aim of advancing the digital banking profile of women for mobile payment, online borrowing, knowledge of digital savings devices and cybersecurity. Capacity-building efforts like these can mitigate fears of technology usage, encourage financial confidence and increase formal digital finance adoption.

Additionally, since the use of digital microfinance had a strong effect on creating income to poverty group and savings habits and financial independence, it means that both digital finance services and entrepreneurship development programs should be considered together. It is important that financial institutions and other development agencies aggregate the technology inherent in digital credit with a foundation of business mentoring, financial planning, enterprise management training and market linkage support, lowering the friction for women to sustainably harness funds borrowed into their future. Implementing these holistic strategies can improve women's business ownership and also increase their financial resilience in the long term.

It also highlights the challenges of digital microfinance services, such as low levels of digital competence, safety and security issues, inadequate customer support, and a lack of digital infrastructure. This is why, while justifying the need for policy interventions, it becomes important that imperatives such as digital infrastructure, internet accessibility (in particular intra-consumer bases), enforcement of consumer protection frameworks and mechanisms to enable cybersecurity should be seen as untouchable. Policymakers can further enhance vertical and horizontal synergies by combining the offerings of Banks, Microcredit Institutions (MFIs), FinTech players, Telecoms and ladies' self-help groups to furnish the underprivileged women with a digital financial ecosystem. Individually or together, these transactional and policy measures not only can contribute to broader financial inclusion objectives, but they also support progress on several SDGs, as discussed below, specifically SDG 5 (Gender Equality), SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry Innovation and Infrastructure).

7. CONCLUSION

To analyse how digital microfinance serves as a pathway to women's economic empowerment in terms of digital microfinance service provision, digital financial literacy, frequency of use of digital finance services and barriers to access? Since the expansion of digital financial ecosystems across the developing world, gathering insights on how technology-enabled financial services can help drive women's economic advancement has emerged as a priority for inclusive, sustainable development. More specifically, the study was conducted to provide empirical evidence on the ways that digital microfinance improves women's involvement in economic action and improves their financial health.

We find that women gain especially much from the digital microfinance services, in particular by improving their access to, but also their financial involvement with, mainly formal financial services. Digital financial literacy was also conducive to improving women's usage and utilisation of the platforms. Smart women are the ones who know how to play by preparing the game; they focus all their energy on financial stability. In general, women with improved digital financial literacy are more confident in their use of these technologies, and they can take advantage of this confidence in accessing credit, saving and payment more easily. The overall picture suggests that yes, greater use of digital microfinance services leads not only to earnings, savings behaviour and financial autonomy but also opens the door to broader development benefits. This points to the fact that digital financial inclusion means much more than simply better access to finance.

It further identifies the main obstacles that still obstruct mass uptake of digital microfinance services in practice, as well as related issues on digital literacy and cybersecurity challenges, the limited functionality of these services and a range of infrastructure-related bottlenecks. The report found that merely giving women digital financial services will not so easily sustainably impact their economic empowerment, but it requires also other supports in the areas of education, infrastructure (to facilitate mobile banking), consumer protection and institutional support. Addressing these barriers is critical to enable women, especially from the economically marginalised and underserved population groups, to reap inclusive and equitable benefits of digital financial transformation.

From the research perspective, this study contributes to the body of knowledge by providing an empirical framework for explaining women's economic empowerment through digital microfinance services, digital financial literacy and utilisation of digital microfinance. In contrast to much of the prior literature that assessed these constructs in isolation, this study shows how the interconnectedness between them serves to build women's economic capability and involvement. This offers useful insights for researchers, policymakers, financial institutions and FinTech providers working on building an inclusive digital financial ecosystem that supports women entrepreneurs to build long-term resilience. The study concludes that digital microfinance is an important strategy avenue for women's economic empowerment (WEE), and that investment in the three

aspects of digital capability, financial inclusion and supportive policy environment will be vital to support inclusive economic growth and sustainable development in a digital economy.

7.1 Limitations of the Study

The current study is the first one to explore the relationships between CMO and both RCI and NR; however, it also has some limitations that should be pointed out. The study has some potential limitations: First, a cross-sectional research design is used to capture respondents' perceptions at one time point because it cannot provide causal relationships among study variables. Secondly, the findings were based on self-reported questionnaire data, which can suffer from response and social desirability bias even when employing validated measurement scales. Third, the study considers only women using digital microfinance impact in the sample of the study area, which may restrict the generalisation to all other geographical regions and socio-economic contexts. While this research explores the contribution of digital microfinance services, digital financial literacy and digital microfinance usage in explaining women's economic empowerment, other contextual factors such as institutional support, socio-cultural context, financial policy role, etc. These limitations do not detract from the importance of the findings; rather, they suggest important avenues for extending this research in different contexts using different methods and additional explanatory variables.

7.2 Future Research Directions

The results of this study raise several possible future directions for a closer investigation into the clinical functioning. Future research could take a longitudinal approach to investigate how sustained use of digital microfinance services impact women's economic empowerment and financial sustainability over time. This future cohort study would then link to comparative research across states and urban/rural nations that better generalise the findings through differences in digital infrastructure, banking system structure and local economic conditions. This framework can therefore, be expanded with managerial drivers such as institutional support, digital confidence/trust, financial self-efficacy, entrepreneurial orientation, technology readiness and government policy intervention among researchers to get a holistic overview of the full picture of women's enrolment into digital finance. Future research may also investigate mediation or moderation by way of digital economic literacy, financial resilience or social support in examining the relation between fiscal microfinance and women's empowerment. Lastly, we believe certain mixed-method and qualitative methodologies relying on interviews and case studies can deepen our understanding of women's lived experience, behavioural motivations to use, or barriers that prevent them from using digital financial services and complement this study's quantitative evidence base while contributing to the growing literature on links between digital finance and women's empowerment.

REFERENCES

1. Abdelwahed NAA, Bano S, Al Doghan MA, Aljughiman AA, Shah N, Soomro BA (2025), Empowering women through digital technology: unravelling the nexus between digital enablers, entrepreneurial orientation and innovations. *Equality, Diversity and Inclusion: An International Journal*, Vol. 44 No. 5 pp. 602–626, doi: <https://doi.org/10.1108/EDI-02-2024-0072>
2. Arshad, A. (2023). Nexus between financial inclusion and women empowerment: Evidence from developing countries. *Gender in Management: An International Journal*, 38(4), 561–580.
3. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
4. Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2022). The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. World Bank.
5. Fanta, A. B., & Makina, D. (2024). Digital financial literacy and financial inclusion: Evidence from developing economies. *Journal of Financial Services Marketing*, 29(2), 165–181.
6. Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*, 30(3), 435–464. <https://doi.org/10.1111/1467-7660.00125>
7. Koefer, F., Kraemer-Eis, H., & Gvetadze, S. (2024). Addressing financial and digital literacy challenges for inclusive finance. *European Investment Fund Working Paper No. 97*.
8. Koomson, Isaac & Villano, Rene. (2024). Financial Inclusion and Sustainable Rural Development. 10.1007/978-981-97-6132-6.
9. Kumari, D., et al. (2025). Role of gender-based digital financial inclusion and women empowerment in poverty reduction: Evidence from Asian countries. *Discover Sustainability*.
10. Putri, Arinda & Wiryono, Sudarso & Damayanti, Sylviana & Rahadi, Raden. (2026). Digital Financial Literacy: Emerging New Dimensions in the Digital Economy Era. *Qubahan Academic Journal*. 6. 717-739. 10.48161/qaj.v6n1a2153.
11. Mabrouk, F., & Abdelsalam, M. (2023). Empowering women through digital financial inclusion: Evidence from Saudi Arabia. *Sustainability*, 15(12), 9154. <https://doi.org/10.3390/su15129154>
12. Mhlanga, David (2020) Industry 4.0 in finance: The impact of Artificial Intelligence (AI) on digital financial inclusion, *International Journal of Financial Studies*, ISSN 2227-7072, MDPI, Basel, Vol. 8, Iss. 3, pp. 1-14, <https://doi.org/10.3390/ijfs8030045>
13. Ozili, P. K. (2023). Financial inclusion research around the world: A review. *Forum for Social Economics*, 52(3), 457–479.
14. Pal, M., Gupta, H., & Joshi, Y. (2022). Social and economic empowerment of women through financial inclusion: Empirical evidence from India. *Equality, Diversity and Inclusion: An International Journal*, 41(2), 294–305.
15. Patel, D., et al. (2025). Assessing the role of microfinance institutions in enhancing women's livelihoods: A regional study from Gujarat, India.
16. Rodríguez-Raga, S., et al. (2024). FinTech as a digital innovation in microfinance companies: A systematic literature review. *European Journal of Innovation Management*.
17. Sherraden, M. S. (2013). Building blocks of financial capability. In J. Birkenmaier, M. S. Sherraden, & J. C. Curley (Eds.), *Financial Capability and Asset Development: Research, Education, Policy, and Practice* (pp. 3–43). Oxford University Press.
18. Showkat, M. (2025). The impact of financial literacy on women's economic empowerment: The mediating role of digital financial services. *Cogent Economics & Finance*, 13(1).
19. Yuneline, Mirza & Rosanti, Maria. (2023). The Role of Digital Finance, Financial Literacy, and Lifestyle on Financial Behaviour. *HOLISTICA – Journal of Business and Public Administration*. 14. 97-115. 10.2478/hjbpa-2023-0018.