

A Machine Learning Model to Evaluate Digital Financial Services Adoption and Sustainable Women Empowerment

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Purpose: Financial services enabled by digital technology can help address the challenges faced by women by overcoming the barriers of proximity and cost. Despite notable advancements in digital financial inclusion in India, women still face obstacles in accessing and utilizing digital financial services.

Design/methodology/approach: A machine learning-based self-efficacy-value adoption model (SVAM) is applied to study the influence of self-efficacy and perceived value on the intention to adopt digital financial services (DFS). Likewise, a machine learning-based threshold decision theory was applied to examine the relationship between digital financial services access and the dimension of sustainable women empowerment in rural India.

Findings: The results suggest that enhancing user experience and highlighting the benefits of DFS can increase adoption rates among women, thus promoting their economic and social empowerment.

Originality/value: In this study, the authors examine an integrated framework based on supervised machine learning to access digital financial services for rural women. They are among the first to apply a self-efficacy-based value adoption model through machine learning to explore this topic. The adoption of digital financial services significantly enhances women's economic, social, and psychological empowerment in rural areas. This evidence-based study will inform policy discussions on developing a gender-sensitive strategy to promote the adoption of digital financial services among women.

Keywords: digital financial services, digital financial inclusion, machine learning, women empowerment, gender, self-efficacy-based value adoption model

INTRODUCTION

The development of information and communication technology (ICT) and the growth of the financial sector are two important drivers for economic growth. With a single click of a button, we can now connect, transact, get information, express our opinions, and use services online. This revolution in ICT has had a tremendous impact on many aspects of human life and considerably enhanced global connectivity. Therefore, digitalization acts as a catalyst for inclusive long-term economic growth and is also recognized as a tool to achieve the UN Sustainable Development Goals (SDGs) (Hasan et al., 2021). In this context, digitalization can help with economic development in many ways. Firstly, digitalization of services is seen as a critical development tool to narrow the socioeconomic gap in the economic system between the 'haves' and 'have-nots'. Next, digitalization will make it easier for new markets and businesses to prosper, as well as for new job opportunities to arise. Consequently, it offers an overall positive spillover effect by generating additional revenue sources for a nation (Haftu, 2019). Likewise, it also improves the productivity of firms by enabling them to broaden their market reach and improve the range of products they offer, which boosts the national economy (Pradhan et al., 2014). Digital technologies hold a great promise in the delivery of developmental services, including healthcare, education, and financial services, especially in rural remote communities (Dutta et al., 2019; Gutiérrez-Romero & Ahamed, 2021; B. Pradhan et al., 2021). It could ensure secure, low-cost services timely and enable more specialized services that meet the needs of vulnerable people on a large scale. This will help in economic growth, poverty reduction, and quality of life (Kanungo & Gupta, 2021).

On the other hand, finance is also a powerful tool for promoting economic growth and development. It is often recognized as an essential component to improve social and economic inclusion (Adedokun & Ağa, 2021; R. P. Pradhan & Sahoo, 2021). According to studies, a digital financial sector can act as a gateway to sustainable economic growth by efficiently allocating resources for productive activities, making financial services such as savings, credit and insurance available to large segments of the population, and assisting people in individuals managing their investment risk (Ibrahim & Alagidede, 2018; Ruiz, 2018). Furthermore, those who have access to a formal financial system are more likely to grow their overall savings, which will enhance their investable resources. Consequently, a rise in the invested surplus enables financial institutions to modify their loan portfolios by providing access to financial services to the people previously ruled out of the formal financial system. There are shreds of evidence that households with access to financial services are more resilient to financial shocks than those without it (Pal et al., 2021; Pal & Gupta, 2022). Therefore, the importance of financial inclusion (FI hereafter) in fostering sustainable economic growth cannot be understated. However, Demircuc-Kunt et al. (2022) in their study observed that there were 1.4 billion adults worldwide reportedly forbidden access to bank accounts. The majority of the unbanked population (54%) lives in seven densely populated developing nations. Although India has more than 78% of its citizens hold bank accounts, it lagged behind other developed countries in adopting the formal banking system. For example, only 16% of the population with bank accounts used their mobile phones or the Internet to check their account balances, and 13% of individuals have been using a debit/credit card. While 35% of people with bank accounts made or received digital payments (Demircuc-Kunt et al., 2022).

Tay et al. (2022) believe that developing an alternative digital distribution ecosystem allows digital financial services (DFS hereafter) to address the previously mentioned problems. Digital financial services are defined as the access and delivery of financial services, such as savings, payments, credit, and remittances, through digital channels, including cards and mobile devices. These services offer enormous opportunities for advancing digital financial inclusion (DFI hereafter), which can help achieve the SDGs and build long-term social and economic prosperity for individuals (Kanungo & Gupta, 2021). Moreover, the widespread acceptance and use of digital financial services are predicted to boost global GDP by \$3.7 trillion by 2025 across all emerging markets. This increase in GDP could generate up to 95 million new jobs, enhancing overall productivity and the efficiency of government spending (Manyika et al., 2016). Table 1 highlights the scholarly contributions to studying the impact of digital financial services on the SDGs.

TABLE 1
LIST OF SCHOLARLY CONTRIBUTIONS OF DIGITAL FINANCIAL SERVICES
TOWARDS SDGS

Sustainable Development Goals	Impact (Direct/Indirect) of digital financial services towards Sustainable Development Goals (SDGs)
No Poverty	Access to low-cost financial services aids in poverty reduction by creating more opportunities for employment through the online market; smooth access to funds leads to build resilience against shocks and enhances the living standard of people (Pradhan & Sahoo, 2021)
Zero hunger	Secure and reliable social benefit transfers or remittances by digital financial services improve the efficiency of the agriculture value chain, assist in addressing food security-related challenges and are resilient against climate change shocks (Mpofu, 2023).
Good health and wellbeing	Digital financial services may help in improving the speed and reach of delivering low-cost health services, faster health wage payments and effectively monitoring the health programs resulting in increases the affordability of health services and well-being for the underprivileged (Dutta et al., 2019; Kanungo & Gupta, 2021).
Quality education	Digital financial services may aid lower-income families in better managing their educational expenses, while national education systems and institutions can improve their financial management. As a result, digital financial services may support the allocation of funds for instructors and technology to offer quality education (Hasan et al., 2021).
Gender equality	Digital financial services facilitate women to better manage their finances and accumulate assets to achieve economic development and gender equality (Tay et al., 2022).
Clean water and sanitation	Digital financial services decrease operational costs while fostering the long-term development and maintenance of infrastructure in rural regions, making it possible for water and sanitation providers to offer their services to low-income people (Ikehi et al., 2023).
Affordable and clean energy	Digital financial services could provide low-cost prepaid services to marginalized groups to help them become more financially viable and empower them to access affordable and clean energy (Tang & Zhou, 2023).
Decent work and economic growth	Accessibility of finance by digital financial services supports low-cost business strategies, entrepreneurship and micro, small and medium enterprises (MSMEs) for economic growth (R. P. Pradhan & Sahoo, 2021).
Industry, innovation and infrastructure	Small businesses may employ digital financial services to grow, innovate, penetrate new markets, and attract low-income people to participate in the transition economy (Pradhan et al., 2015).
Reduced inequalities	Digital financial services may act as an equalizing factor by enabling low-income households to access affordable digital finance and raising financial resilience (Gallego-Losada et al., 2023).
Sustainable cities and communities	Digitizing payments may aid in making underprivileged populations' access to public services like public transportation more efficient and economical by eliminating the reliance on cash transactions, especially in cities (Tay et al., 2022).

Climate action	Digital finance may be utilized to promote climate action through the facilitation of transparent and standardized transactions as well as the facilitation of more effective monitoring and accrediting procedures used for innovative climate funding (Schulz & Feist, 2021)
Peace, justice and strong institutions	By boosting accountability and traceability, digital payments significantly reduce corruption and fraud in the economy and increase transparency and security in financial transactions. Therefore, as a result of economic development, peace, justice, and civil institutions can be strengthened (Pradhan & Sahoo, 2021).

A growing body of research recognizes the significance of financial inclusion in achieving sustainable and equitable economic growth. Poor economic participation by women is viewed as a major problem in several countries. Particularly in emerging nations like India, women and girls constitute nearly half of the population, yet their contribution to India's GDP is only 17%, which is significantly lower than the global average of 37% (United Nations, 2023). A similar disparity exists in access to and use of financial services in India despite numerous initiatives by the Government of India. Women encounter several challenges, including limited mobility, inconveniences, and restricted business hours in the formal financial system, as well as concerns regarding physical currency that heighten issues of safety and confidentiality. Overall, women have restricted access to health, education, and financial institutions. They are also less able to enter the workforce, spending much of their time on unpaid home duties, which increases their vulnerability to poverty. Consequently, women's economic fragility and poverty have a direct impact on their levels of illiteracy, lack of professional skills, and ability to secure stable, long-term livelihoods (Pal & Gupta, 2022). According to Sorgner et al. (2017), the gender disparity in digital technology usage further undermines women's empowerment (WE). The existence of a gender-based digital divide and its consequences offer fewer advantages to women than to their male counterparts. Additionally, these barriers inhibit women from participating in the digital revolution, and limited access to information leads to a lack of digital literacy that prevents women's involvement in economic activities and the job market.

On the other hand, digital technologies have the potential to eliminate the barriers that women face and have been vital in accelerating their growth through the promotion of social and economic well-being. Access to digital technologies can benefit women by providing them with resources for employment and economic opportunities that can help close the gender wage gap, easing access to health and education information, and empowering women to combat violence while advancing women's empowerment and leadership (Hasan et al., 2021; Pal & Gupta, 2022). The existing extensive literature indicates that empowered women have positive ripple effects on human development indicators and a reduction in poverty and inequality. It also enables women to voice their equal human rights and dignity within families, society, and the economy (Dutta et al., 2020).

Governments are working to promote the use of digital financial services and ensure financial inclusion for everyone. However, the vast majority of women still lack access to advanced digital financial services. Therefore, it is crucial to explore and investigate the factors that influence women's and girls' decisions to adopt and use digital financial services for their financial needs. To accomplish this, we conducted a literature review on the contribution of digital financial services to women's empowerment. Simultaneously, we also examine the literature on various technological acceptance models that analyze the intention to adopt digital financial services.

REVIEW OF THE LITERATURE

Over the past decade, financial services for vulnerable populations have undergone substantial changes. Technological advancements have given rise to new business models and enabled digital financial services to play a crucial role in bridging gender inequalities in financial inclusion. Studies indicate that adopting digital financial services empowers women to make their own decisions regarding saving money, spending it, taking financial risks, or protecting themselves from future uncertainties. Therefore, it signifies a notable

increase in the economic well-being of women (Pal & Gupta, 2022; Tay et al., 2022). Similarly, digital financial services can support rural women in becoming more productive and increasing their chances of earning money by introducing them to opportunities for employment beyond rural areas (Balapour et al., 2019). Financial institutions have a significant opportunity to boost their revenue by employing digital technologies to eliminate the gender gap in financial access. Furthermore, it facilitates additional employment and greater financial privacy for women compared to those who receive cash transfers, promoting intra-household decision-making and favorable business outcomes (Roy & Patro, 2022). Suri & Jack (2016) examined the impact of mobile money on women's economic empowerment. The M-PESA mobile payment system in Kenya was found to help lift families headed by women out of poverty. A similar piece of evidence is presented by Herbert (2017). In his study, he argues that digital financial services can provide better and lower-cost access to the public delivery system and tailored financial services for women, leading to enhanced digital financial inclusion. This will assist women in overcoming their temporal and spatial constraints and open the door to greater economic resilience and self-empowerment. Therefore, it is evident from the literature that technology has a significant impact on enhancing an individual's productivity and competitiveness.

To quantify the consumer's intention to adopt new technology at the individual level, two key elements are typically considered. These are product-based (technology-based) and person-related (human-related) (Chatterjee et al., 2020). Product-based factors influence how valuable people perceive technology; several models, including the Technology Acceptance Model (TAM) (Davis, 1989), Motivation Model (MM) (Davis et al., 1992), Theory of Planned Behaviour (TPB) (Ajzen, 1991), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), have been constructed to explore these variables. According to the Theory of Reasoned Action (TRA hereafter), a person's performance in a particular action is determined by Behavioural Intention, which is influenced by the person's attitude and subjective norms (SN) regarding the action. Later, Ajzen (1991) added a new concept of perceived behavioural control (PBC) to the TRA to adapt it to the theory of planned behavior (TPB). PBC is defined as the degree to which a person believes that they can control how their behaviour is carried out. Davis (1989) developed the TAM model to illustrate how consumers adopt and use technology. The TAM utilises the constructs of perceived ease-of-use and perceived usefulness to replace many of the TRA's attitude measurements, whereas the MM accepts extrinsic and intrinsic motivational factors for accepting technology. TPB is an extension of the Theory of Reasoned Action (TRA), which was constructed based on social psychology. In the UTAUT model, variables such as performance expectancy, social influence, effort, and facilitating conditions encourage a person's acceptance of technology that increases their productivity.

Several studies (Chawla & Joshi, 2020; Kasilingam, 2020; Malik et al., 2021) have been conducted to determine how well the TAM predicts user intent for adopting digital financial services, including internet banking, mobile banking, mobile digital wallets, chatbot services, and cryptocurrency. Following this, Venkatesh et al. (2003) introduced the UTAUT model, which comprises four factors that influence users' behavioral intentions: effort expectations, performance expectations, social influence, and enabling conditions. Many studies (Jadil et al., 2021; Naeem et al., 2022) have demonstrated the efficacy of UTAUT in explaining the adoption of digital financial transactions. However, these theories have been criticized for being oversimplified, as they cannot fully explain people's behavioral purpose in adopting technology, and for neglecting to consider dynamic human behavior (Assaker, 2020; Taylor & Todd, 1995).

Human personal factors include self-efficacy, personality, and the physical characteristics of an individual adopting any new technology, first mentioned in social cognitive theory (SCT) by Bandura (1986). Bandura theorised that cognitive, psychological, and environmental factors affect an individual's behavioral intentions. SCT emphasises the importance of functional, social, and emotional value as essential preconditions for perceived value, influencing human action. This notion states that a person's abilities, knowledge, and skills affect or determine their behavior. Later, a self-efficacy based value adoption model (SVAM) was proposed for technology adoption as a fundamental component built on the value adoption model (VAM) within the established theoretical framework of SCT (Zhu et al., 2010, 2022). The theory revealed that strong self-efficacy increases and sustains the effort required for optimal

performance while using existing skills, which is challenging if one is plagued by self-doubt. Past empirical research has focused on the importance of self-efficacy in technology adoption and reported a positive effect on user behavior. Although the idea of self-efficacy was highlighted as a key component for the adoption of digital financial services, the most influential theories of human behavior remain significantly underrepresented in the context of research on the adoption of digital financial technology. This concept is connected to one's self-confidence in the ability to adopt a particular technology (Santini et al., 2019). In the literature on information systems, researchers have concentrated on analysing the relationship between product-based features and people's technology adoption behavior (IS). However, the influence of a person's self-efficacy factors on digital financial services has received little academic attention (John, 2013; Zhu et al., 2022). As a result, the authors of the present study have examined how self-efficacy elements and product-based perceived value factors affect the adoption of digital financial services.

Furthermore, previous research has noted these perceived values-based factors and self-efficacy as individual users' independent decisions to use digital technology; however, no study has focused on a comprehensive framework for sustainable women empowerment (SWE) combined with digital financial inclusion (DFI) and its components. By ensuring better access to digital financial services, the government can support the social and economic advancement of women and ultimately achieve the sustainable goal of gender equality.

In light of this context, the current study is described as a single frame of factors influencing the adoption of digital financial services (a proxy for digital financial inclusion) and the effects of digital financial inclusion on sustainable women's empowerment. The goal of the current study is to examine the variables that affect the use of digital financial services as well as the impacts that their uptake has on sustainable women's empowerment in developing nations like India. The authors here have developed three main hypotheses to accomplish these research goals, which are as follows:

H₁: The self-efficacy factors of the individual have a significant impact on the adoption of digital financial services by rural women.

H₂: Perceived Value-Based Factors have a significant impact on the adoption of digital financial services by rural women.

H₃: The adoption of digital financial services has a significant influence on sustainable women empowerment.

CONCEPTUAL FRAMEWORK

It is essential to conceptualize the research approach to test these three study hypotheses. The self-efficacy-based value adoption model (SVAM) proposed by Zhu et al. (2010) in the context of technology acceptance is widely regarded by researchers (Kajol et al., 2022; Santini et al., 2019; Zhu et al., 2022). The authors used machine learning (LR) to test the first two study hypotheses with the self-efficacy-based value adoption model. Similarly, logistic regression is employed to evaluate the third hypothesis according to the threshold decision-making theory put forth by Kau & Hill (1972) in the field of consumer behavior science. Here, the LR approach has been utilized because the dependent variable is a binary measure, and some independent variables are on a Likert scale. Keep in mind that each woman must reach a reaction threshold before adopting digital financial services; therefore, the threshold theory is applicable in the present context. The mathematical function of sustainable women's empowerment is captured as follows:

$$\text{SWE} = f(\text{DFI}) = f(\text{SEF}, \text{PVF}) \quad (1)$$

Where, the meaning of each symbol is mentioned in Table 2.

TABLE 2
DESCRIPTION OF THE VARIABLES WITH DIRECTION OF RELATION

Construct Code	Name of variables	Description of the variables	Direction of relation with DFS
Self-Efficacy Factors (SEF)			
EFS	Earning Status in Family	A woman is either only one of the earning members of the family.	+
ES	Education Status	Highlights the educational attainment of women.	+
Perceived Value based Factors (PVF)			
PU	Perceived usefulness	The extent to which a woman believes that adopting a particular technology will improve her job performance.	+
PEU	Perceived easy to use	The extent to which a woman thinks using a certain technology will be simple and effortless.	+
PAC	Perceived affordable cost	The degree to which a woman believes that the cost of a particular technology is affordable and the reflection of intrinsic value based on her perception.	+
PPC	Perceived process complementarity	A psychological perception in the minds of women that using/enrolling for a specific technology is easy and simple to learn.	+
DFS	Adopting Digital Financial Services	Women's readiness to use digital or electronic devices to initiate, activate and confirm financial transactions.	+
Sustainable Women Empowerment (Social, psychological & economic dimensions)			
FD	Role in the financial decision of the family	Women play an influential role in financial decision-making in the family	+

Source: Authors' compilation

Questionnaire Development and Survey Design

The current study empirically assesses the proposed research model using survey data. Existing scales from the literature were adapted for the survey questionnaire. The authors included variables for the components of self-efficacy, the perceived value of digital financial services, and women's participation in family financial decisions to measure sustainable women's empowerment while creating the questionnaire. An introduction to digital financial services was provided at the beginning of the questionnaire to ensure that the respondents fully understood it. Furthermore, the authors decided to conduct the field study in the Indian state of Gujarat to make optimal use of available resources and address geographic constraints. Gujarat is considered one of the most developed states in India (an emerging economy), with around 45% of the population being female and 70% of them literate, with 57% living in rural areas (INDIA, 2011). Consequently, the population of women in rural Gujarat is the target demographic of the study. To satisfy the sample size calculation criteria for this study, 385 samples are required (Krejcie & Morgan, 1970). To ensure that a larger sample (n=774) is collected, a simple random sampling approach is utilized, and respondents' consent is obtained before initiating the sampling process.

Descriptive Statistics of the Participants

Based on the respondents' descriptive data, it shows that although 58% of women have graduate degrees, most are housewives, and consequently, 57% did not engage in any economic activity.

Furthermore, despite having a solid educational background, 45% of the participants do not even have a job (95% have at least a school education). Additionally, since 57% of the participants are housewives, they have never used digital financial services (Table 3).

TABLE 3
DESCRIPTIVE STUDY OF THE SAMPLE

	Frequency	Percentage
Occupation		
Business	38	5
Employee in company	298	38
Housewife	438	57
Education		
Illiterate	37	5
High School	284	37
Graduate	453	58
Positions in the household		
Not an earning member	350	45
Earning member	424	55
Digital financial services experience		
Using digital financial services	324	42
Not using digital financial services	450	58

Source: Authors' computation

Results of Analysis

Data were analyzed using logistic regression estimation because the dependent variable is a binary measure (1 = Yes and 0 = No), and some of the independent variables are on the Likert scale. Here, the Nagelkerke R² is found to be 0.489, and the Cox & Snell R² is 0.367, which is regarded as a reliable indicator for the logistic regression model's goodness of fit index (Field, 2009). Moreover, as suggested by researchers, the Hosmer and Lemeshow test is also deemed satisfactory, with a predictable percentage of about 68% (Gujarati et al., 2012).

The logistic regression model with selection using a stepwise forward method has identified two factors with six variables that have a statistically significant impact ($p < 0.05$) on the adoption of digital financial services by rural women in India (Table 4).

TABLE 4
RESULTS FOR ADAPTATION OF DIGITAL FINANCIAL SERVICES

Dependent variable	Adopting Digital Financial Services (DFSs) (Yes=1, No=0)		
Independent variables	Odds-ratio	p-value	Remarks
Self-Efficacy Factors (SEF)			
EFS	1.643	0.000	Adoption of DFS by women increases 1.643 times
ES	5.600	0.000	Adoption of DFS by women increases 5.600 times
Perceived Value-based Factors			
PU	1.120	0.042	Adoption of DFS by women increases 1.120 times
PEU	1.693	0.000	Adoption of DFS by women increases 1.693 times
PAC	1.361	0.000	Adoption of DFS by women increases 1.361 times
PPC	1.131	0.021	Adoption of DFS by women increases 1.131 times
Hosmer and Lemeshow test	Nagelkerke R2		Cox & Snell R2 Predicted Percentage
47.507	0.489		0.367 68%

Source: Authors' computation

Similarly, to the technique mentioned, the logistic regression analysis has found the effect of the digital financial services adoption on the sustainable women empowerment through the social, psychological & economic dimensions of empowerment, as the variable '*The role in the financial decision of the family*' has a statistically significant ($p < 0.05$) odds-ratio 10.250 (Table 5).

TABLE 5
RESULTS OF EXAMINATION OF THE IMPACT OF DFSS ON SUSTAINABLE WOMEN'S EMPOWERMENT

Dependent variable	Role in the financial decision of the family (Yes=1, No=0)		
Independent variable	Odds-ratios	p-value	Remarks
Adopting Digital Financial Services (DFS)	10.250	0.000	The probability of SWE increases 10.250 times

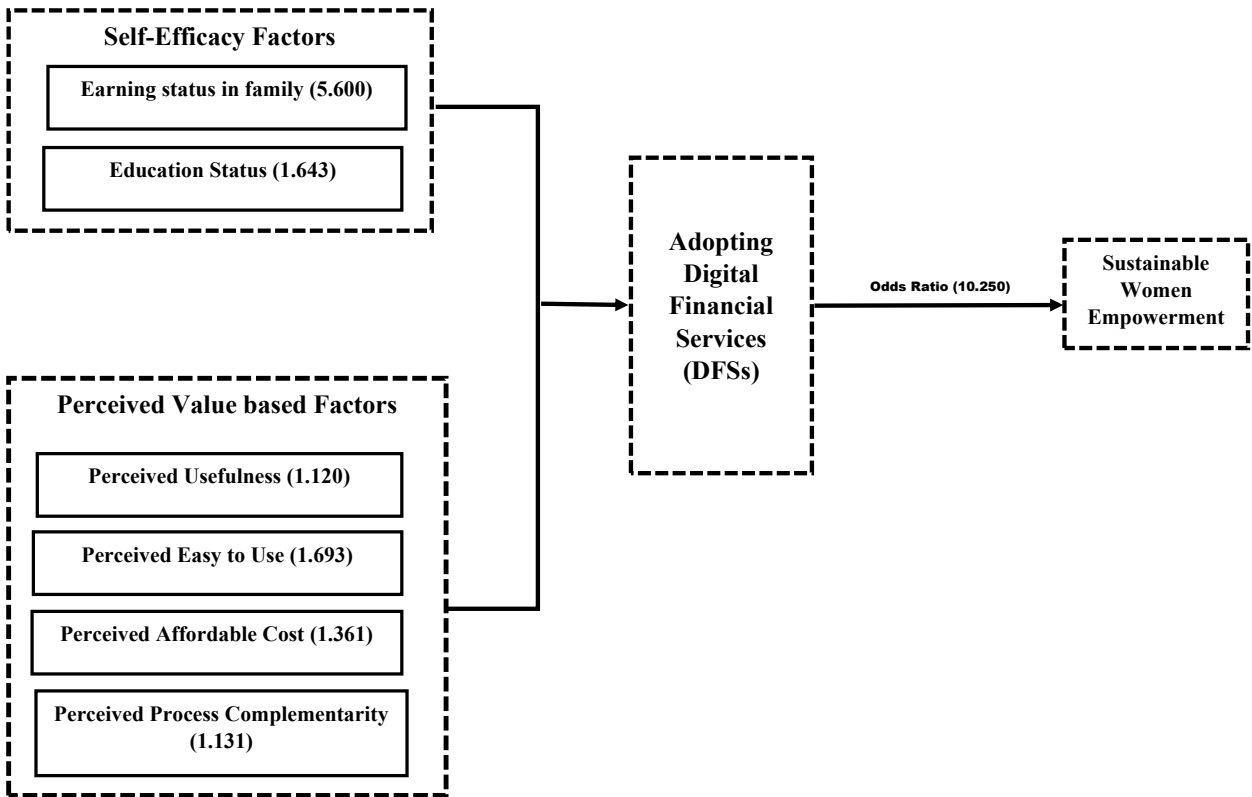
Source: Authors' computation

DISCUSSION AND PRINCIPAL FINDINGS

Based on the data analysis results, this study examines the influence of self-efficacy and perceived-value variables on the intention to adopt digital financial services, focusing on the effect of adopting these services on sustainable women empowerment. The findings demonstrate that all three hypotheses are valid. Prior research on technology adoption has emphasized the significance of self-efficacy theory (Kulviwat et al., 2014; Zhu et al., 2022). For example, Kulviwat et al. (2014) found that self-efficacy is a predictor of technology adoption intention, while Rana & Dwivedi (2015) identified self-efficacy as a predictor of e-Governance system adoption. Consistent with these studies, the present research indicates that self-efficacy factors positively influence female users' willingness to use digital financial services. Two crucial components of the self-efficacy model, Earning Status in the Family (ESF) and Education Status (ES), both positively impact women's adoption of digital financial services. Therefore, women's perceptions of their comfort in using these services may be greatly influenced by their sense of efficacy. Our findings support the notion that when women engage with high-tech advancements, mindset is paramount. In conclusion,

self-efficacy is shown to meaningfully affect how women perceive the adoption of digital financial services (Kulviwat et al., 2014).

FIGURE 1
CONCEPTUAL MODEL FOR SWE THROUGH ADOPTION OF DFSS



Note: Numeric values are of the odds ratio; Source Authors' creation

Similarly, many academics believe that providing value to users is the key to long-term business success. In addition to utilitarian value, perceived value also encompasses emotional value and social significance. Particularly in the marketing of digital financial services, the intrinsic affective component of the service has outweighed extrinsic cognitive components such as utility, usability, perceived utility, perceived cost (price), and perceived complementarity. The outcome of the present study on digital financial services aligns with Zhu et al. (2022) study on free-floating car services, which found that perceived value positively impacts technology adoption. According to the relationship between perceived value and the desire to use digital financial services, the likelihood of adoption increases as more value is perceived. Therefore, it will be easier for digital financial services firms to emphasize the core values during product design and marketing if they understand how women perceive the value of digital financial services. The current empirical study shows, using a quantitative approach, that technical value and functional value contribute to the creation of the perceived value of digital financial services. Digital financial services can enhance the effectiveness of digital financial inclusion, making it an environmentally friendly and cost-effective method of money transfer. Using digital financial services is less expensive than sending money physically, raising its perceived worth and, in turn, the intention of adoption.

THEORETICAL AND PRACTICAL IMPLICATIONS

This study significantly contributes to the body of literature on the use of digital financial services and their effect on women's sustainable development in rural areas of emerging nations. To begin with, previous studies utilized self-efficacy components to evaluate the intention to adopt digital financial services, either as a standalone construct or as an antecedent to other constructs (Kajol et al., 2022). The authors have not found any studies that sought to explore the combined effects of self-efficacy aspects on the intention to adopt digital financial services. Second, existing research on the factors influencing digital financial services adoption indicates that the authors are among the first to use a self-efficacy-based value adoption model (SVAM) in the form of logistic regression to explore this topic. Next, this study is the first of its kind to design an integrated framework of variables influencing access to digital financial services and to simultaneously visualize the impact of digital financial services adoption on sustainable women's empowerment in rural India. A threshold decision-making theory of consumer behavior science is applied to understand the interlinks between access to digital financial services and sustainable women's empowerment. To sum up, the authors define both independent and dependent factors and their relationship to sustainable women's empowerment to conduct an extensive analysis of the challenges women face when adopting digital financial services.

The findings of the present study emphasize the importance of self-efficacy variables in women's attitudes towards perceived value components in their intention to adopt digital financial services. The first recommendation from this study for financial institutions and policymakers is to raise awareness of digital financial services and their significance, with an emphasis on creating a user interface that is more user-friendly and offers a comfortable platform compatible with women's lifestyles. The second implication of the results is that financial institutions should seek to develop and promote qualities of digital financial services such as usability, dependability, security, and favourable conditions for women.

FUTURE SCOPE AND LIMITATIONS

The study sought to explore two key variables: Self-efficacy and perceived value, which are equally important in any other region of the nation, that affect women's intention to adopt digital financial services. For the purpose of creating a more solid policy framework, future studies can be conducted by including additional significant aspects, including effort expectancy, performance expectancy, facilitation situation, and social effect on women's adoption intention of digital financial services. Certain limitations to this study might be taken into account for related future research. This study is conducted in rural Gujarat state, with the potential to be expanded to metropolitan regions to build a comprehensive model for women with digital financial inclusion.

CONCLUSIONS

The study examined the factors that can influence rural women to adopt digital financial services that substantially boost women's economic, social, and psychological empowerment in rural India. This evidence-based study will facilitate the policy discussion on the development of a gender-sensitive strategy to increase the adoption of digital financial services among women. For example, government and financial institutions should design digital financial services and their offerings with usability, user-friendliness, affordable pricing, and process complementarity in mind to make them more accessible to women in rural areas. Furthermore, policymakers should invest more effort in women-centered programs to raise awareness and impart knowledge about the formal financial system and its benefits for sustainable development.

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