UNDERSTANDING THE DETERMINANTS OF DIGITAL ADOPTION IN FINANCIAL INSTITUTIONS: AN APPLICATION OF THE TECHNOLOGY ACCEPTANCE MODEL

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Abstract

Access to essential banking and financial services is unequally distributed, and this is causing the high risk of financial exclusion globally. India is no exception, and hence, financial inclusion has become an important field for research. To this end, this paper aims to study the impact of digitalisation on the actual usage of banking and financial services among the underprivileged community. To achieve the objectives, researchers have based their study on the technology acceptance model (TAM), focusing on factors such as perceived ease of use (PEU) with perceived usefulness (PU) and intention to use (INT), and intention to use with the actual usage (US) (Rakipi et al., 2023). A sample of 150 individuals has been investigated in this research. The data have been collected using a convenience sampling technique. However, perceived ease of use has no significant direct relationship with intention to use. This broadens the horizon of our knowledge. The findings indicate that users may not find it easy to use technology, and hence do not intend to use digital financial/banking services. At the same time, they perceive this new technology as easy and useful without creating an intention to use it. Banking professionals, industry experts, and policymakers should address this issue by incorporating it into strategies and policies aimed at enhancing financial inclusion.

Keywords: Digitalisation, Financial Inclusion, Banking Services, TAM, PLS-SEM

Authors' individual contribution: Conceptualization — Man.A.; Methodology — N.M.; Software — Moh.A.; Validation — N.M.; Formal Analysis — N.M. & Moh.A.; Investigation — H.N.; Writing — Original Draft — Man.A., N.M., and Moh.A.; Writing — Review & Editing — N.M., Moh.A., and H.N; Supervision — M.I.T. and L.N.D.; Project Administration — M.I.T. and L.N.D.; Funding Acquisition — M.I.T. and L.N.D.

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1. INTRODUCTION

Globally, 1.7 billion people lack access to banking services, highlighting significant disparities in financial service availability and contributing to widespread financial exclusion (Demirguc-Kunt et al., 2018). Financial exclusion is a social ill, while financial inclusion is desirable as it minimizes social exclusion (Aaluri et al., 2016). Financial inclusion, on the other hand, reduces economic disparities by providing access to essential financial services to underserved, underprivileged communities (Khanvilkar, 2015). It brings the underprivileged communities within the fold of mainstream banking that have multi-faceted benefits for the country's economy (Afjal, 2023). Therefore, the financial inclusion framework enhances the global competitiveness of countries by ensuring that a significant portion of their population participates in the formal financial system (World Bank, 2019; Iqbal & Sami, 2017).

At the same time, recent advancements and trends in information and communication technology (ICT) through innovative technologies like mobile-phone-enabled solutions, electronic money models, and digital payment platforms have all had a significant impact on financial inclusion (Qatawneh & Makhlouf, 2025; Rahi et al., 2017). It has been observed that countries with robust financial institutions are harnessing the transformative strength of information technology (IT) to provide digital financial services (DFS) (Pasha & Elbages, 2022). The DFS has played a pivotal role in enhancing the provision of essential financial services to the underprivileged (Agwu, 2021). Innovative banking solutions, such as smart cards, enable financial institutions to scale their microfinance portfolios.

The integration of IT in financial systems is driving democratization and sustainable economic progress (Senyo et al., 2022). It reduces costs, enhancing efficiency and making financial services accessible and affordable for underprivileged (Aaluri et al., 2016). It also facilitates data analytics for informed decision-making, enabling financial institutions to tailor services to specific needs, which helps generate target-oriented results (Afifa et al., 2024). Providing banking services could become more affordable with the help of IT, particularly for individuals who are financially excluded and reside in rural areas. Technology is the enabling component for financial inclusion, and selecting technology-driven models is an important choice that might separate or strengthen the inclusion strategy (Wellalage et al., 2021).

In India, the drive for financial inclusion started in 1956 with the objective of sustainable and inclusive growth. One of the mandates was to provide universal access to financial services, which led the Reserve Bank of India (RBI) to adopt a bank-centric model to deepen financial inclusion. In order to fulfil the mandate of universal access to financial services, the basic financial services such as savings, credit, insurance, and payment options were to be provided to all, with particular focus on reaching to the most marginalised person of the society. To make the citizenry actually start using the available services, both awareness and trust have to be built. Therefore, financial literacy campaigns emerged alongside the development of customer grievance redressal mechanisms in order to bring awareness and build trust among the under-banked communities. Consequently, in the early 1990s, the focus was to open more bank branches, especially in under-banked areas, and by the early 2000s, the same strategy was adopted to install more ATMs (Sharma & Khurana, 2023). The advent of ICT further helped to get more customers on board through the digital ecosystem (RBI, 2020).

In 2021, the RBI conceptualised a comprehensive index to measure financial inclusion. The index incorporates various aspects of financial inclusion and ranges between 0 and 100. The financial inclusion index in 22–23 stands at 60.1%, which was 56.4% showing significant development. It is observed that the improvement is specifically attributable to the sage and quality dimensions of the index (Ramanathan, 2023).

The Indian banking sector is also emphasizing financial inclusion to integrate its sizable population into the national financial system, and the government of India is also taking many measures to bring more and more people within the fold of mainstream banking (Iqbal & Sami, 2017). Thus, it is pertinent to study the digitalisation of banking and financial services and its impact on financial inclusion. Therefore, this paper aims to study the impact of digitalisation on consumers' intention to use DFS and on actual usage of DFS in the context of underprivileged communities. To this end, the study uses the technology acceptance model (TAM) proposed by Davis (1987), and structural equation modeling (SEM) has been applied for data analysis using partial least squares structural equation modeling (PLS-SEM) software.

The paper is organised into six sections: Section 1 introduces the paper, Section 2 presents a review of existing literature, theoretical background, and proposed hypotheses, Section 3 outlines research methodology, Section 4 discusses the results of the study, and finally Section 5 concludes the study.

2. LITERATURE REVIEW

2.1. Digitalisation, technology adoption, and financial inclusion

There are numerous research works that investigated the impact of digitalisation or IT adoption on the intention to use and actual usage of digital banking/financial services by the users (Shaikh & Amin, 2025; Le et al., 2023; Pasha & Elbages, 2022; Rakipi et al., 2023). This study extends the previous research in the context of the users of underprivileged/underserved communities. Bahl et al. (2023) examines the direct effect of digitalisation on banking performance and training as a mediating variable between digitalisation and banking performance. They find a positive impact of digitalisation on banking performance.

Noreen et al. (2023) discuss the motivations for customers to adopt technology, more specifically artificial intelligence (AI) in banking services, and found a positive correlation between AI tools and banking services' usage. Kumar (2022) examines the impact of digital banking on financial inclusion and finds that technological infrastructure offering ATMs, e-wallets, IMPS (immediate payment service), UPI (unified payments interface), Internet connectivity, and mobile banking has promoted financial inclusion. Li et al. (2022) study the impact

and level of effectiveness of ICT on financial inclusion. They find that there is a positive impact between the two variables, but the width and the depth of financial inclusion differ from country to country. They also find that the better the ICT infrastructure, the higher the possibility of promoting financial inclusion.

Tiwari et al. (2021) extend the applicability of the TAM constructs by incorporating customer awareness, perceived risk, and perceived trust to examine users' behavioural intentions toward adopting mobile banking. The study tested the proposed framework using regression analysis and analysed the data collected from the convenience sampling method. The data was obtained from a sample of 311 mobile banking users. Consistent with prior research, the findings demonstrated that perceived usefulness, perceived ease of use, customer awareness, perceived risk, and perceived trust significantly influenced the adoption of mobile banking services in the Indian context.

Another study conducted by Kamdjoug et al. (2021) investigates the factors influencing customer adoption of mobile banking apps in Cameroon. The findings highlighted that a) utilitarian expectations, hedonic motivation, and social status, and b) the exploitative and explorative use of this technology, significantly impact user loyalty and satisfaction while also playing a crucial role in promoting financial inclusion in Cameroon. The use of smartphone technology has been beneficial (Firmansyah et al., 2022). One of the smartphone's applications is the use of mobile banking. However, the adoption rate of mobile banking technology in Indonesia is still relatively low. This research aims to determine the adoption rate of mobile banking in Indonesia using TAM. Based on the result, it shows that the influence of self-efficacy on perceived ease of use, self-efficacy and perceived credibility on attitude towards use, and attitudes towards use on adoption intentions provides significant value. The result can conclude that users are confident and trust in themself in using the m-banking application. Still, users do not feel the ease and usefulness offered by the mobile banking application in Indonesia.

Agwu (2021) highlights gaps in financial inclusion in India, particularly in rural and backward areas. Despite the nationalization of scheduled commercial banks and regional rural banks, these areas still lack affordable financial services, leading to a significant portion of the rural population relying on informal sources like microfinance institutions and moneylenders. The study emphasizes the need to improve the quality of services provided by banks and to include other financial institutions like microfinance institutions, self-help groups, and post office savings banks in future research. Sanakulov and Karjaluoto (2015) do a systematic review of literature covering 67 studies conducted during the period 2005–2013 and find a) most of the studies are quantitative in nature and come from Asia, b) TAM is the most use theory, and c) future research should also utilize qualitative methods and examine the behavioural outcomes of mobile adoption instead of simply adoption in consumer markets. The study by Liu et al. (2010) examines the expanded TAM model to investigate the elements that affect the acceptance of various forms of digital banking. Thus, in order to examine the influence of digital banking on financial inclusion, this study employs TAM.

2.2. Theoretical background and hypotheses development

Most of the studies conducted to identify factors influencing the acceptance of digital forms of banking/financial services had to first explore elements that influence the technology adoption behaviour of users. In that pursuit, the TAM is extremely helpful and the most widely utilised theoretical framework (Liu et al., 2010; Sanakulov & Karjaluoto, 2015; Tiwari et al., 2021; Firmansyah et al., 2022). It has also evolved significantly and has gone through three stages of development: adoption, validation, and extension. At the adoption level, TAM was evaluated with a variety of information system applications, including communication technologies and internet-related applications (Davis, 1987). The validation phase was used to establish causal linkages between TAM constructs, whereas the extension phase extended the two primary constructs, perceived utility and perceived ease of use (Karahanna & Straub, 1999). The model has the following constructs *vis-à-vis*: perceived ease of use, perceived usefulness, attitude, intention to use, and actual usage. To achieve the objective of our study, we adopted all four constructs except attitude.

Perceived ease of use (PEU) describes the extent to which an individual feels that utilizing a specific system would require no effort (Liu et al., 2010). The definition of "ease" is "freedom from difficult or great effort", which leads to this conclusion. A person's ability to devote effort to the several tasks for which they are accountable is limited (Karahanna & Straub, 1999). Throughout the years, a number of studies have been carried out that offer empirical evidence regarding the significant influence that perceived ease of use has on intention to use, either directly or indirectly, through its effect on perceived usefulness (Anouze & Alamro, 2020; Ramli & Rahmawati, 2020; Wellalage et al., 2021; Nurahmasari et al., 2023; Hossain, 2023). However, it is known perceived ease of use has a significant effect on intention to use either directly or indirectly through perceived usefulness (Arunkumar, 2008). The bankers should make it easy to use the systems, as the users will feel less intimidated to use digital forms of banking systems (Moon & Kim, 2001).

Perceived usefulness (PU) is the utility of a system when the users believe that using a particular system will help them complete the task efficiently (Davis, 1987). Perceived usefulness has been identified as an important factor leading to intention to use a technology (Shuetz & Venkatesh, 2020). A person's belief or assessment of how much utilising a specific technology, service, or system would improve their performance, productivity, or effectiveness in finishing tasks or accomplishing goals is known as perceived usefulness (Hossain, 2023). Vijayasarathy (2004) finds that users, if convinced that technology is beneficial for them, are motivated to use it. Kim et al. (2009) find that customers see the mobile banking features positively, as it saves time and money. Puspita and Kusumawati (2019) find perceived usefulness to be significantly affecting the intention to use and usage of digital bank services.

Intention to use (INT) refers to an individual's subjective likelihood or willingness to undertake a specific behaviour, such as adopting a new technology, system, or service (Arunkumar, 2008). The study discovered that the factors influencing

intention-to-use significantly predict actual usage behaviour (Tao, 2008). The direct influence of perceived usefulness and the indirect impact of perceived ease of use on both behaviour intention and actual behaviour demonstrated the importance of ease of use throughout the early stages of technology adoption (Le et al., 2023).

The relationship between intentions to use and usage (US) behaviour is widely researched in psychology, consumer behaviour, and other fields (Ajzen, 1991). Marketing managers and academicians collaborated to study the impact of technology on purchasing intentions, as customers' purchasing behaviour is influenced by their intentions to buy. Academics have identified purchase intention as a factor influencing purchasing behaviour (Tao, 2008). Intentions are believed to accurately reflect a person's actual purchasing behaviour when used to estimate it. It's important to consider whether self-revealed intentions are accurate predictors of eventual purchase behaviour. If not, advertisers could consider combining stated indicators of intention to use with additional information to assess the likelihood of real buying behaviour (Anouze & Alamro, 2020). As a result, investigating this link within the context of Internet banking adoption is critical. Thus, consequent to the TAM model, the study proposes the following hypotheses, illustrated in the conceptual model (Figure 1).

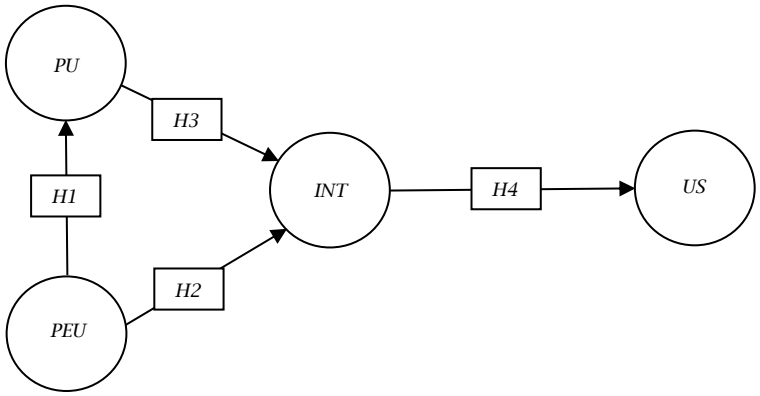
H1: Perceived usefulness of digital banking services is substantially and positively influenced by perceived ease of use.

H2: Intention to use digital banking services is substantially and positively influenced by perceived ease of use.

H3: Intention to use digital banking services is substantially and positively influenced by perceived usefulness.

H4: Usage of digital banking services is substantially and positively influenced by intention to use.

Figure 1. Research procedure



Source: Adopted from Davis (1987).

3. RESEARCH METHODOLOGY

To conduct this empirical study, a convenience sampling approach has been used for data collection, which is defined as a data collection process from a population accessible to the researcher and in a cost-effective manner (Hair et al., 2003; Rahi, 2017). The data collection instrument consists of a structured questionnaire on a Likert scale with 5 points, where 5 stands for "strongly agree" and 1 for "strongly disagree". The questionnaire consists of two sections. The first section contains questions on demographic characteristics like age, gender, qualification, and income, while the second section includes constructs, namely perceived ease of use, perceived usefulness, intention to use, and actual usage, which have been adopted from the TAM model. To measure the constructs, the items have been adopted from previous research works (Appendix A). A set of 210 questionnaires was distributed in offline (Haryana, India) and online mode, out of which 150 usable responses were analysed. The responses with missing values were not included in the study. Further, the responses showing extreme responses were re-checked and were also removed based on Mahalanobis distance, following the standards of survey-based research (Hair et al., 2014). Out of the 150 usable responses collected, 131 were obtained through offline mode and only 19 through online means. The predominance of offline data collection enhances the reliability and validity of the study, as in-person surveys allow for better engagement, clarification of questions, and reduced response bias (Bryman, 2016). While both modes were considered in the analysis, the negligible proportion of online responses minimizes the risk of mode-related bias influencing the findings.

The data were primarily collected in Haryana, a single state in India. While this geographic concentration may limit generalisability, it enables a more in-depth and context-specific understanding of consumer behaviour. In a country as diverse as India, regional studies are a recognised approach, particularly in social research, where consumer attitudes and behaviours often vary significantly across states (Bhatnagr & Rajesh, 2024). Focusing on one region allows for richer insights that can serve as a foundation for future comparative studies across other areas. Similar regional approaches have been used effectively in previous research, such as studies focused on Delhi/National Capital Region (Jin & Son, 2013), affirming the validity of this methodological choice.

Further, the Kaiser-Meyer-Olkin (KMO) test has been conducted to ensure the adequacy of sample size, which is 0.717 for our sample. The acceptable limit ranges between 0.5 and 1 (Filipović et al., 2014). Bartlett's test of sphericity evaluates the homogeneity of the correlation matrix (identity matrix), and this also falls within the acceptable range (Table 1).

Table 1. KMO and Bartlett's test

KMO measure of sampling adequacy		0.717
Bartlett's test of sphericity	Approx. Chi-square	138.660
	df	6
	Sig.	0.000

Source: Authors' calculation.

The common method bias (CMB) has been examined in this study using Harman's single-factor test. Since the results of this study indicate that a single factor alone can account for 34.784% of the discrepancy (see Table 2), which is less than the usual 50% limit, there is no reason to be concerned about CMB.

Table 2. Harman's single-factor test

Component	*Extraction sums of squared loadings*		
	Total	*% of variance*	*Cumulative %*
1	7.932	34.784	34.784

Source: Authors' calculation.

The data analysis has been carried out with a PLS-SEM using Smart PLS V4.0 to test the relationships between the variables. The use of PLS-SEM in this study is methodologically sound and well-suited to the sample size of 150 respondents. Unlike covariance-based SEM (CB-SEM), which typically requires larger samples and is more confirmatory in nature, PLS-SEM is particularly effective for exploratory research and smaller to medium sample sizes (Hair et al., 2022). Wong (2013) further supports this by noting that PLS-SEM performs reliably with as few as 100–150 observations, provided the model demonstrates strong path coefficients and reliable indicators. In this context, PLS-SEM enables meaningful analysis without compromising the integrity of the results. While CB-SEM remains a viable alternative for studies with more extensive data sets, the decision to employ PLS-SEM here ensures analytical flexibility and robustness, aligning with best practices for social science research involving modest sample sizes.

As shown in Table 3, the percentage of male respondents is higher than that of females in this sample. It is 81.3% and 18.7% for males and females, respectively. There are studies that have used skewed samples and yet shown significant insights (Olteanu et al., 2019). Additionally, the data collected represents a socio-economic backward area, whereby it is generally male members who own bank accounts or deal in banking services within a family unit. Cho et al. (2022) argue that demographic imbalances do not invalidate the findings of the study, especially if the research question pertains primarily to the overrepresented group. However, to examine potential measurement invariance, an independent samples t-test has been conducted across gender groups (Appendix B). The results indicate that none of the variables (*PU*, *PEU*, *INT*, and *US*) exhibit statistically significant differences between male and female respondents, as all p-values are well above the conventional significance threshold ($p > 0.05$). These findings suggest that measurement invariance is not a concern in this dataset, and responses across gender groups can be considered comparable.

Table 3. Demographic profile of the respondents

Demographic characteristics		*Frequency*	*Percentage (%)*
Gender	Male	122	81.3
	Female	28	18.7
Education	Illiterate	4	2.7
	High school	9	6
	Intermediate	11	7.3
	Degree	77	51.3
	Postgraduate	48	32
	Others	1	0.7
Age	18–25	49	32.7
	26–30	52	34.7
	31–40	28	18.7
	41–50	19	12.6
	51–60	2	1.3
Marital status	Married	116	77.3
	Unmarried	34	22.7
Profession	Government employee	17	11.3
	Private employee	62	41.3
	Business	24	16
	Self-employed	17	11.3
	Student	26	17.4
	Housewife	4	2.7
Monthly income	10000–20000	35	23.4
	20000–30000	32	21.3
	30000–40000	26	17.3
	40000–50000	30	20
	50000 and more	27	18

Source: Authors' calculation.

The highest number of respondents are degree holders (51.3%), while 32.0% are postgraduates, 7.3% are intermediate, 2.7% are illiterate, and 6% respondents have completed higher secondary education. From the total number of respondents, 32.7% are 18–25 years old, 34.7% of respondents belong to the 26–30 years old group, 18.7% respondents belong to the 31–40 years old group, 12.6% respondents belong to the 41–50 years old group, and 1.3% of the total respondents belong to the 51–60 years old group, the majority of the respondents belong to the 26–30 years old group. A higher proportion of respondents are married (77.3%), while 22.7% of respondents are unmarried. As for the occupation of the sample respondents, it is evident that the majority belong to the private sector employment, accounting for 41.3%. Comparatively, respondents who are in business make up to 16% of the sample. Those categorised as government employees and self-

employed are equally distributed in the sample (11.3%). Students and housewives account for 17.4% and 2.7% of the respondents in the study. Concerning the monthly income of respondents, the highest proportion of respondents, i.e., 23.4%, earn a monthly income between 10000–20000 Indian rupees (Rs.), and a monthly income of Rs. 20000–30000 was earned by 21.3% of respondents. About 17.3% of respondents earn a monthly income of Rs. 30000–40000, 20.0% of respondents earn a monthly income of Rs. 40000–50000, and 18.0% of the respondents earn a monthly income of Rs. 50000 and above.

4. RESULT AND DISCUSSION

To analyse the research model under the SEM technique, the following two-stage analytical procedure is conducted. First, the validity and reliability of the items and constructs (measurement model) are analysed to ensure the reliability and validity of the instrument, followed by hypothesis testing (structural model) as suggested by Hair et al. (2014).

4.1. Measurement model

The structural modeling assessment could only be performed once the measurement model of the latent construct for dimensionality, validity, and reliability using the confirmatory factor analysis (CFA) method has been examined. In SEM, the dimension model (outer model) is evaluated to clarify reliability and validity measures, including composite reliability (CR), convergent validity, discriminant validity, and internal consistency (Fornell & Cha, 1994).

Cronbach's alpha (α) is one of the most basic measures to verify the reliability of the variables. As stated by Tavakol and Dennick (2011), the Cronbach's alpha value should preferably be over 0.70. The Cronbach's alpha coefficients ranged from 0.823 to 0.939, above 0.7, implying that the measurement has a high degree of reliability (Table 4). This indicates that the survey has a massively high degree of acceptance and coherent scoring.

The CR ensures internal consistency by calculating the amount of variance shared by different items in the variables (Henseler, 2017). The loadings greater than 0.70 indicate reliable indicators (Sarstedt et al., 2017). In this study, the CR ranges between 0.835 and 0.950, which is above 0.7 and hence acceptable (Table 4).

Generally, in PLS-SEM, Cronbach's alpha is regarded as the lower constraint, whereas CR represents the upper bound of internal consistency dependability when estimating the measurement model. As a result, the actual reliability of the construction is most likely somewhere between Cronbach's alpha and CR (Sarstedt et al., 2021).

Table 4. Construct reliability and validity

Constructs	*Cronbach's alpha*	*CR (rho_a)*	*CR (rho_c)*	*AVE*
INT	0.823	0.835	0.872	0.576
PEU	0.847	0.852	0.887	0.567
PU	0.863	0.875	0.896	0.591
US	0.847	0.884	0.883	0.559

Source: Authors' calculation.

After establishing reliability, convergent and discriminant validity must be analysed, as convergent validity refers to how well a construct's indicators converge by explaining item variances. The discriminant validity explains the extent to which a construct is empirically unique from other constructs, both in terms of correlation and indicator representation (Henseler, 2017).

To determine convergent validity, average variance extracted (AVE) values are calculated and reported. The AVE of 0.50 and above indicates that the construct explains more than 50% of the indicator's variance, demonstrating that the indicator exhibits a satisfactory degree of reliability (Hair et al., 2022). As shown in Table 4, the AVE values were above 0.5 for all the constructs and hence satisfactory.

The discriminant validity is assessed using the heterotrait-monotrait ratio (HTMT) of correlations (Henseler, 2017). The HTMT criterion is defined as the mean of average correlations across constructs divided by the mean of average correlations across indicators measuring the same construct. Therefore, the value for HTMT should be less than 0.85. As shown in Table 5, all the values are within the acceptable limit, ensuring discriminant validity.

Table 5. Discriminant validity

HTMT	*INT*	*PEU*	*PU*	*US*
INT				
PEU	0.265			
PU	0.459	0.680		
US	0.309	0.567	0.601	

Source: Authors' calculation.

The structural model is evaluated for exploratory collinearity using the variance inflation factor (VIF), implication, and sensitivity. Hair et al. (2022) discussed the significance of route coefficients in models and their ability to explain and predict outcomes. VIF values above 5 indicate the possibility of collinearity between analyst conceptions; however, collinearity can also occur at lower VIF values of 3–5 (Becker et al., 2015). All the values obtained are less than 5 (Table 6).

Table 6. Collinearity statistics (VIF)

Items	*VIF*
INT1	1.716
INT2	1.767
INT3	2.248
INT4	3.428
INT5	3.292
PEU1	1.457
PEU2	1.601
PEU3	2.787
PEU4	1.866
PEU5	2.689
PEU6	1.684
PU1	2.240
PU2	2.742
PU3	2.746
PU4	2.714
PU5	2.299
PU6	2.466
US1	2.272
US2	2.038
US3	2.381
US4	2.250
US5	2.616
US6	2.537

Source: Authors' calculation.

4.2. Path coefficients: Direct relationships

The conceptual results of the model and hypothesis decision-making are shown in Table 7. The path coefficients are generated to test hypotheses, and their significance is quantified using t-tests. At a 95% confidence level, the track and path coefficient of a mark is significant if the overall t-value of the test statistic is greater than 1.96 (the critical value at the level of 0.05). Otherwise, the path coefficient is insignificant. The value of the route coefficient shows the intensity of the link, while the sign indicates the nature of the relationship (direct or indirect). Table 7 shows the research model fitting results and indicates significant pathways with total t-values greater than 1.95.

Table 7. Hypotheses testing

Hypotheses	*Original sample (O)*	*Sample mean (M)*	*Standard deviation*	*T-statistics*	*p-values*	*R-square*	*f^2*	*Q^2*	*Results*
PEU → PU	0.574	0.574	0.063	9.059	0.000	0.131	0.151	0.473	Supported
PEU →INT	-0.012	-0.009	0.087	0.144	0.886				Not supported
PU → INT	0.368	0.367	0.107	3.454	0.001	0.329	0.490		Supported
INT → US	0.242	0.247	0.105	2.312	0.021	0.059	0.063		Supported

Source: Authors' calculation.

The hypothesis testing using SEM, as illustrated in Table 7, shows the following results:

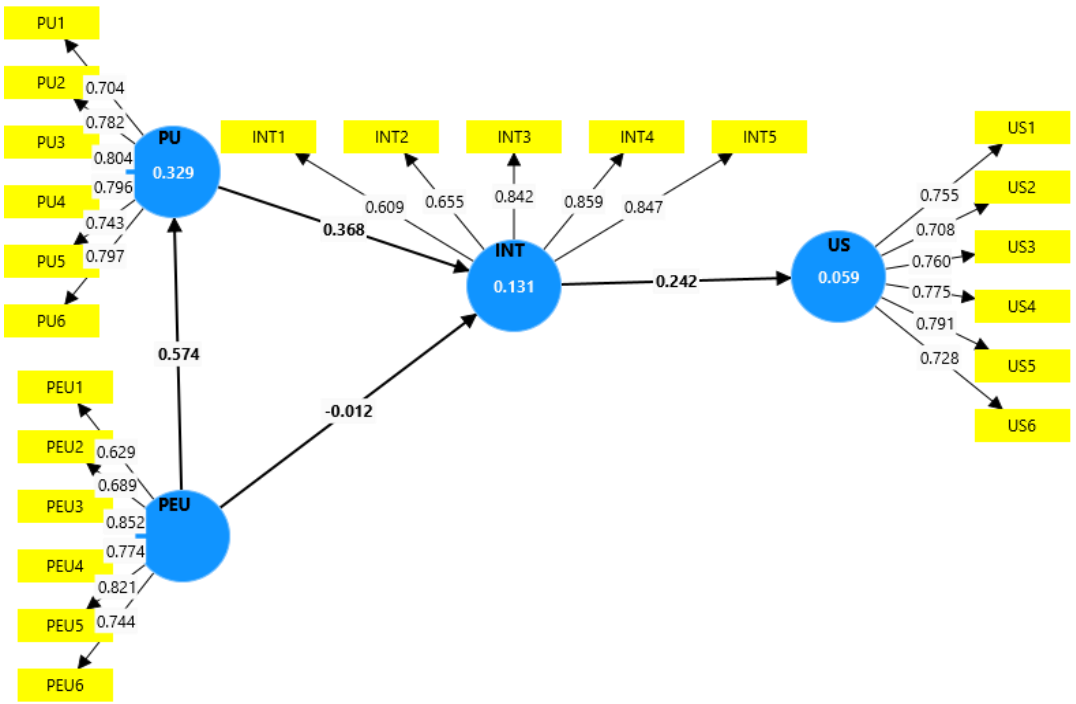
1. *PEU -> PU*: The results show that perceived ease of use significantly influences perceived usefulness ($p < 0.01$). The partial test (t-test) confirms a significant relationship between *PEU* and *PU*, suggesting that ease of use impacts the perceived usefulness of digital services. This supports the hypothesis (*H1*) and aligns with the TAM. It implies that financial institutions should prioritize enhancing the user-friendliness of e-banking and m-banking features to improve their perceived usefulness.

2. *PEU -> INT*: The results show that perceived ease of use does not significantly influence intention to use ($p > 0.05$). This novel finding highlights that while ease of use affects perceived usefulness, it does not directly impact the intention to use among non-mainstream users. These users may find digital banking services helpful, but face barriers such as limited technological efficacy or insufficient user-friendly app features. Financial institutions should address these challenges to better serve this user segment and encourage their engagement with digital services.

3. *PU -> INT*: The analysis indicates that perceived usefulness significantly impacts the intention to use digital services ($p < 0.01$). The partial test (t-test) also confirms this relationship ($p < 0.05$), supporting hypothesis. This underscores that as users perceive digital technologies as more useful, their intention to use them increases. Bankers should focus on highlighting the practical benefits of their digital offerings to drive user adoption.

4. *INT -> US*: The findings suggest that the intention to use significantly affects actual usage of digital services ($p < 0.01$). The partial test (t-test) shows a significant relationship between *INT* and *US* ($p < 0.05$), indicating that actual usage results from users' intentions. This emphasizes the need for banks and policymakers to foster a strong intention to use digital services to increase actual adoption rates.

Figure 2. Structural equation model



The study discovered that perceived usefulness had a substantial impact on intention to use, intention to use had a large impact on actual usage of digital banking, and the effect of ease of use on intention to use was considerably influenced by perceived ease of use. However, perceived ease of use had no effect on intention to use. This means that the consumers are willing to adopt the digital banking services largely because they find it beneficial. The benefits might include greater access and lower cost, making it affordable. This insight could be helpful for professionals and policymakers alike while drawing up new policies to engage more consumers from backward areas in digital banking services.

5. CONCLUSION

Financial inclusion is undisputably instrumental in economic growth, and it necessitates access to banks and other financial services for low-income households, but their inclusion is hampered by the absence of suitable delivery mechanisms and products. With the help of digitalisation, the gap between growth expectations and actuality could be closed by allowing more citizens to engage in mainstream financial activity. ATMs and mobile banking are two examples of contemporary technologies that have helped to expand financial services into rural locations and improve customer experience.

Digitalisation has also helped institutions to deliver services at lower transaction costs, which directly promotes inclusive growth and creates a win-win scenario for clients and banks. The government of India, along with the RBI, has taken many steps to enhance financial inclusion and hence economic growth by utilising ICT. Thus, the objective of this study was to identify the main factors that impact the intention to use and usage of digital banking/financial services among non-mainstream consumers.

The findings of the present study are aligned with the TAM model that a) perceived ease of use has a positive and significant impact on perceived usefulness, b) perceived usefulness has a positive and significant impact on intention to use, c) intention to use has a positive and significant impact on actual usage, contrary to d) perceived ease of use has a positive and significant impact on intention to use.

It shows that digital banking products have the potential to be more convenient than traditional banking services, and consumers are increasingly using these services in everyday life. Thus, enterprises and service providers must invest more in research to improve the user experience and broaden the user base. As a result, the conclusions are intended to enable policymakers to design their products or improve the features of their digital services to attract more consumers towards digital adoption. It also signifies the relevance of TAM as a robust technology adoption model.

Furthermore, there are a few limitations, despite the fact that the study was conducted and yielded significant results. The current sample size is sufficient but may not accurately represent the population under investigation due to cost and time constraints. The existing limitations can be taken as opportunities for conducting future research. Future studies should also identify and analyse a complete list of challenges in the Indian context.

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APPENDIX A. QUESTIONNAIRE

Dear respondent,
Thank you for your participation in this survey, which is aimed at studying the impact of information technology on financial inclusion. All information will be used for research purpose only. You are requested to spare a few minutes to give the appropriate responses to the issues asked in the following questionnaire/

Section A: Demographics

1. **Gender**: A. Male, B. Female.
2. **Age**: A. 18–25 years old, B. 26–30 years old, C. 31–40 years old, D. 41–50 years old, E. 51–60 years old.
3. **Education**: A. Illiterate, B. High school, C. Intermediate, D. Degree, E. Postgraduate, F. Others (please specify) _____
4. **Marital status**: A. Married, B. Unmarried.
5. **Profession**: A. Government employee, B. Private employee, C. Business, D. Self-employed E. Student F. Housewife.
6. **Monthly income**: A. 10000–20000, B. 20000–30000, C. 30000–40000 D. 40000–50000, E. 50000 and more.

Section B: Questions

Table A.1. Questionnaire items and measurement scales

Items	*Description*	*SD*	*D*	*N*	*A*	*SA*
Intention to use		*1*	*2*	*3*	*4*	*5*
INT1	Given the chance, I intend to use the internet banking.					
INT2	It is likely that I will carry out banking transaction with online banking.					
INT3	Will frequently utilize online banking in the future.					
INT4	Next time, plan to utilize online banking.					
INT5	Take digital banking for future usage.					
Usage		*1*	*2*	*3*	*4*	*5*
US1	E-banking services are user-friendly.					
US2	E-banking supports my special banking needs.					
US3	M-banking can achieve all my banking responsibilities.					
US4	M-banking is easy to learn and use.					
US5	It is easy to make payments, transfer money, and collect account information offered by the bank.					
US6	Digital payment services are faste and efficient.					
Perceived ease of use		*1*	*2*	*3*	*4*	*5*
PEU1	Digital banking transfers are completed quickly when compared to traditional methods.					
PEU2	Digital banking saves travel time and energy as we do not need to stand in queues at banks or pay utility bills.					
PEU3	Within a few minutes, even high-value transfers can be made in digital banking.					
PEU4	Mobile banking enables me to utilize banking services more quickly and enhance effectiveness.					
PEU5	Instructions for using mobile banking are easy to follow.					
PEU6	You find ease in receiving payments from the government through mobile banking.					
Perceived usefulness		*1*	*2*	*3*	*4*	*5*
PU1	I get the balance of my bank account quickly through innovative financial products offered by the bank.					
PU2	I can receive subsidies, salary, and business receipt directly into my bank account.					
PU3	M-Banking service apps provide useful information.					
PU4	The app provides a detailed service specification.					
PU5	E-Banking provides quick movement of funds.					
PU6	E-Banking supports my special banking needs.					

Note: SD — strongly disagree, D —disagree, N — neutral, A — agree, SA — strongly agree.

APPENDIX B

Table B.1. Group statistics

Variables	*Gender*	*N*	*Mean*	*Std. deviation*	*Std. error mean*
PU	Male	122	4.4975	0.38082	0.03448
	Female	28	4.2921	0.35949	0.06794
PEU	Male	122	4.4470	0.44094	0.03992
	Female	28	4.3629	0.38874	0.07346
INT	Male	122	4.3311	0.45980	0.04163
	Female	28	4.1929	0.38290	0.07236
US	Male	122	4.4057	0.38834	0.03516
	Female	28	4.3629	0.34878	0.06591

Table B.2. Independent sample t-test

Variables	*Assumptions*	*Levene's test for equality of variances*		*t-test for equality of means*						
		F	*Sig.*	*t*	*df*	*Sig. (2-tailed)*	*Mean difference*	*Std. error difference*	*95% confidence interval of the difference*	
									Lower	*Upper*
PU	Equal variances assumed	0.002	0.969	2.600	148	0.010	0.20540	0.07900	0.04928	0.36152
	Equal variances not assumed			2.696	42.076	0.010	0.20540	0.07618	0.05166	0.35914
PEU	Equal variances assumed	0.544	0.462	0.929	148	0.354	0.08411	0.09050	-0.09473	0.26295
	Equal variances not assumed			1.006	44.435	0.320	0.08411	0.08361	-0.08435	0.25257
INT	Equal variances assumed	1.758	0.187	1.477	148	0.142	0.13829	0.09362	-0.04671	0.32329
	Equal variances not assumed			1.657	46.688	0.104	0.13829	0.08348	-0.02968	0.30626
US	Equal variances assumed	0.978	0.324	0.536	148	0.592	0.04288	0.07993	-0.11507	0.20083
	Equal variances not assumed			0.574	43.759	0.569	0.04288	0.07470	-0.10770	0.19346