

Determinants of Digital Payment Adoption among Older Adults in Kerala using an Extended UTAUT Model with Trust

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Abstract:

Digital payments systems have become increasingly prevalent in India post-demonetization and the COVID-19 pandemic; yet, acceptance among older individuals in Kerala is inconsistent despite elevated literacy rates and extensive smartphone usage. This research investigated the factors influencing digital payment uptake among persons aged 50 and older, utilizing an augmented Unified Theory of Acceptance and Use of Technology (UTAUT) model that includes trust. A quantitative cross-sectional survey was performed with 300 participants from Kozhikode, Ernakulam, and Thiruvananthapuram, and the data were analyzed utilizing regression methods. The results demonstrate that trust is the most significant predictor of behavioral intention, succeeded by performance expectancy and effort expectancy. Social influence exerted a small impact, whereas conducive factors substantially affected actual usage. The findings indicate a continual access–usage gap, suggesting that mere digital access does not guarantee ongoing adoption. The research underscores the significance of trust, usability, focused digital literacy programs, and enhanced security protocols to facilitate digital payment acceptance among senior citizens.

Keywords: Digital payment adoption; Older adults; Extended UTAUT model; Trust; Kerala.

Introduction

The digitalization of financial transactions has accelerated rapidly during the past decade, altering how individuals interact with money and financial services. In India, this change has been particularly obvious following the Demonetization initiative and subsequently accentuated during the COVID-19 pandemic. These advances fostered a move from cash-based transactions to digital modes, aided by legislative efforts such as Digital India and technology advancements like the Unified Payments Interface (UPI) (Trivedi and Sanchiher, 2023). According to data from the Reserve Bank of India, digital payment transactions in India have developed dramatically over recent years, indicating growing acceptability and integration into regular economic activity (Aljaradat and Shukla, 2025).

Within this national trend, Kerala presents a specific context. The state is marked by high literacy rates, good human development indicators, and considerable smartphone usage. Additionally, Kerala's economy is substantially influenced by remittance inflows from foreign workers, which has contributed to greater exposure to formal financial systems (Vineesh, 2025). Despite these favorable conditions, the adoption of digital payment systems is not consistently dispersed throughout all segments of the population. Empirical data reveal that whereas younger and urban users have rapidly integrated digital payments into their daily lives, older persons demonstrate significantly lower adoption percentages. This difference reveals a major contradiction between digital preparedness and actual usage inside the state (Manikandan, 2025).

A particularly important dimension of this issue lies in the demographic structure of Kerala. The state has a higher proportion of ageing population compared to the national average, making the involvement of older persons in the digital economy both a social and economic need. However, the continuation of lower adoption rates among adults aged 50 and above cannot be explained exclusively by access-related barriers. On the contrary, many individuals within this category possess smartphones and are avid users of communication platforms such as WhatsApp. This implies that the difficulty is not only one of access, but rather one of using behaviour,

demonstrating a gap between digital familiarity and functional adoption of financial technologies (Kumar and Yadav, 2025).

This study conceptualizes this situation as an access–usage gap, where technological exposure does not necessarily convert into acceptance of digital payment methods. Existing research has generally attributed limited adoption to issues such as digital illiteracy or infrastructure difficulties. While these criteria remain relevant, they do not fully describe the behavioural and psychological difficulties experienced by older persons. Concerns connected to security, fear of financial loss, lack of trust in navigating digital interfaces, and perceived complexity play a crucial impact in shaping adoption decisions. In this setting, the function of trust becomes particularly crucial, since older users are more sensitive to perceived hazards associated with digital transactions (Hussain et al., 2025).

From a theoretical standpoint, models such as the Unified Theory of Acceptance and Use of Technology (UTAUT) have been frequently deployed to explain technology adoption behaviour. These models emphasize constructs such as performance expectancy, effort expectancy, social influence, and facilitating situations (Danila et al., 2025). However, its application to older populations, particularly in region-specific situations like Kerala, remains limited. More crucially, while UTAUT provides a robust structural foundation, it does not adequately account for the heightened importance of trust and risk perception among senior users. This provides a conceptual constraint in comprehending digital payment acceptance within this demographic.

Accordingly, this work tries to solve three critical deficiencies. First, it focuses exclusively on older adults in Kerala, a group that has been underrepresented in empirical research despite its growing demographic relevance. Second, it studies the access–usage gap by targeting individuals who are already familiar with digital technology but have not adopted digital payment systems. Third, it expands the UTAUT model by integrating trust as a fundamental factor, so giving a more contextually relevant framework for studying adoption behaviour.

The main objective of this study is to identify and assess the determinants influencing digital payment acceptance among older individuals in Kerala using an enhanced UTAUT model. By doing so, the study hopes to contribute to both theoretical and practical realms. The findings are likely to offer insights for politicians, financial institutions, and technology developers to construct more inclusive and user-centric digital payment solutions. In a larger sense, tackling the challenges faced by older persons is vital for ensuring that the move towards a digital economy does not reinforce existing disparities but instead promotes inclusive financial involvement.

Literature Review

Digital Payment Ecosystem in India and Kerala

India's digital payment ecosystem has expanded tremendously due to legislative support, innovation, and altering consumer behaviour. The advent of UPI enabled real-time, low-cost transactions, driving growth, especially following demonetization and the COVID-19 outbreak. However, adoption remains uneven, especially among younger, urban, and digitally literate people (Bhatia and Caraway, 2203). In Kerala, despite strong literacy, financial access, and smartphone prevalence, usage differs among age groups (Sebastian and Shaiju, 2024). This reveals a gap between digital availability and real adoption. The situation depicts a paradox where significant digital readiness coexists with selective usage, particularly among older persons, emphasizing the necessity for a behaviour-focused analytical approach (Santhosh and Aithal, 2024).

Technology Adoption Models

The Technology Acceptance Model (TAM) has been widely utilized to explain user acceptance of digital technologies, emphasizing perceived usefulness and perceived ease of use as main drivers. While TAM has showed empirical resilience across settings, its explanatory potential in financial technology adoption remains controversial. Several studies demonstrate that perceived usefulness consistently predicts adoption, however the influence of ease of use differs dramatically across user groups, notably among older persons. This contradiction shows that TAM's simplistic form may overlook contextual and demographic factors (Schorr, 2023). The Unified Theory of Acceptance and Use of Technology (UTAUT) extends TAM by including performance expectancy, effort expectancy, social impact, and facilitating factors, so presenting a more comprehensive framework.

Empirical comparisons generally corroborate UTAUT's greater predictive power. However, its application to digital payment situations produces inconsistent findings (Lee et al., 2025).

For instance, whereas some research identify social impact as a key predictor, others indicate minor effects among elderly users who rely less on peer validation and more on personal assessment. Similarly, favorable conditions, albeit theoretically substantial, do not often translate into real utilization when psychological barriers prevail (Xue et al., 2024).

A significant limitations across both models is their limited involvement with emotive dimensions such as trust and perceived risk. In high-stakes situations like digital payments, adoption decisions are not simply rational but are impacted by users' faith in system stability and security. Existing models, by underrepresenting these aspects, fail to properly explain resistance among risk-averse groups such as elderly adults. This gap underlines the need for extending UTAUT by adding trust as a primary determinant rather than a peripheral variable (Ursavaş, 2022).

Determinants of Adoption among Older Adults

The determinants of digital payment uptake reflect diverse behavioural patterns when evaluated within elder groups. Performance expectancy, often a major predictor, is perceived by older adults in strictly utilitarian terms. Unlike younger consumers who may appreciate convenience or innovation, older adults seek quick, tangible benefits. However, empirical findings are not universal; other research indicate that even when usefulness is recognized, adoption does not follow, demonstrating that perceived advantages alone are insufficient without concomitant trust in usage (Dequanter et al., 2022).

Effort expectancy emerges as a disproportionately relevant element. Research continually cites usability problems, particularly complex interfaces and multi-step authentication, as key impediments. While some research imply that training treatments might ameliorate these concerns, others believe that initial bad experiences produce long-lasting resistance, indicating that effort-related barriers are not easily reversible (Tan et al., 2025).

The role of social influence is equally debated. While several studies emphasize the relevance of family members, particularly children, in encouraging adoption, others contend that such dependence may limit independent usage, perpetuating reliance rather than empowerment. This inconsistency suggests a deeper ambivalence regarding whether social influence functions as an enabler or a restraint in this demographic (Schroeder et al., 2023).

Facilitating conditions, including access to devices and technical support, are widely accepted as crucial for adoption. However, data increasingly suggests that these criteria are insufficient in isolation. The continuance of poor adoption despite adequate infrastructure shows that behavioural and psychological characteristics play a more crucial role, demanding a re-evaluation of classic adoption constructs in the context of older users (Mei, 2024).

Barriers and the Access–Usage Gap

A notable gap in existing work is the inadequate conceptualization of the access–usage split, particularly among older persons. While earlier research largely focus on infrastructural hurdles, recent evidence challenges this perspective by indicating that access to smartphones and internet connectivity does not ensure active involvement with digital payment systems. This mismatch is especially noticeable among elderly users who are accustomed with communication programs yet fear financial transactions. The evidence cites fear of financial loss, low self-efficacy, and perceived complexity as main barriers (Sindakis and Showkat, 2024). However, these aspects are generally explored in isolation, resulting in fragmented answers. Few studies systematically investigate how these barriers interact to cause behavioural resistance (Sofi and Al-Fattal, 2026). Consequently, the access–usage divide remains under-theorized, particularly in region-specific contexts like Kerala, where digital availability is strong but adoption remains selective.

Role of Trust in Digital Payments

Trust has emerged as a significant determinant in digital payment uptake, particularly in scenarios involving financial risk. Empirical research regularly reveal that issues linked to security, privacy, and fraud greatly

influence user behaviour. This effect is magnified among older persons, who tend to exhibit higher risk aversion and lesser tolerance for uncertainty (Emini et al., 2026).

Despite its relevance, trust is generally viewed as a secondary concept within existing models, limiting their explanatory depth. The absence of trust as a fundamental variable inhibits the ability of standard frameworks to capture the psychological components of adoption. Integrating trust into the analytical model is therefore vital for understanding digital payment behaviour among elder users (Rasool and Wani, 2026).

Theoretical Framework and Hypotheses

Theoretical Framework: This study is anchored in the UTAUT, which explains technology adoption through four major determinants: performance expectancy, effort expectancy, social influence, and facilitating factors. In the context of digital payments among older persons, these constructs require contextual interpretation. Performance expectancy is evaluated in functional, necessity-driven terms, while effort expectancy becomes crucial owing to usability issues. Social influence functions through tight networks such as family, and favorable conditions supply the essential infrastructure but do not ensure acceptance. To improve the model, trust is introduced as an extra factor, reflecting concerns about security and reliability in digital financial transactions.

Hypotheses:

- **H1:** Performance expectancy positively influences behavioural intention. Older adults adopt digital payments when they perceive clear, practical benefits such as ease in bill payments and reduced dependence on physical banking.
- **H2:** Effort expectancy significantly influences behavioural intention. Ease of use is crucial, as complex interfaces and processes can discourage adoption despite perceived usefulness.
- **H3:** Social influence positively influences behavioural intention. Family members and close social networks encourage adoption, though this may sometimes lead to reliance rather than independent usage.
- **H4:** Facilitating conditions positively influence actual usage. Availability of smartphones, internet access, and support systems enables usage, but alone does not guarantee adoption.
- **H5:** Trust positively influences behavioural intention. Perceived security and reliability are critical, as older adults are more risk-averse and sensitive to potential financial threats.

Research Methodology

This study utilizes a quantitative, cross-sectional research methodology to evaluate the factors of digital payment usage among older individuals in Kerala using an enhanced UTAUT framework. A primary data strategy is applied to capture individual-level views, behavioural intents, and usage patterns, which are vital for experimentally testing the given hypotheses (Chandel and Chandel, 2025).

The target population comprises individuals aged 50 years and above residing in Kerala. To ensure regional coverage and reflect diversity in digital adoption patterns, data is collected from three districts: Kozhikode, Ernakulam, and Thiruvananthapuram. These districts represent disparities in urbanization, economic activity, and internet exposure. The survey specifically includes respondents who own or regularly use cellphones and are aware of digital payment systems but display limited or selective usage, so aligning with the focus on the access–usage divide.

A purposive sample strategy is performed to pick respondents who meet the inclusion criteria (Obilor, 2023). Given the absence of a specified sample frame for this demographic, non-probability sampling is considered appropriate. The total sample size is 300 respondents, with about 100 respondents from each district to ensure equal representation. Efforts are made to include individuals from both urban and semi-urban areas and across diverse socio-economic backgrounds to strengthen the robustness of the findings.

Data is collected using a standardized questionnaire established based on validated assessment scales from earlier studies on UTAUT and digital payment uptake. The instrument consists of three sections: demographic information (age, gender, education, location), digital usage behaviour (smartphone usage and familiarity with digital applications), and measurement of key constructs including performance expectancy, effort expectancy, social influence, facilitating conditions, trust, behavioural intention, and actual usage. All construct items are measured using a 5-point Likert scale, ranging from “strongly disagree” to “strongly agree,” to guarantee consistency and ease of answer.

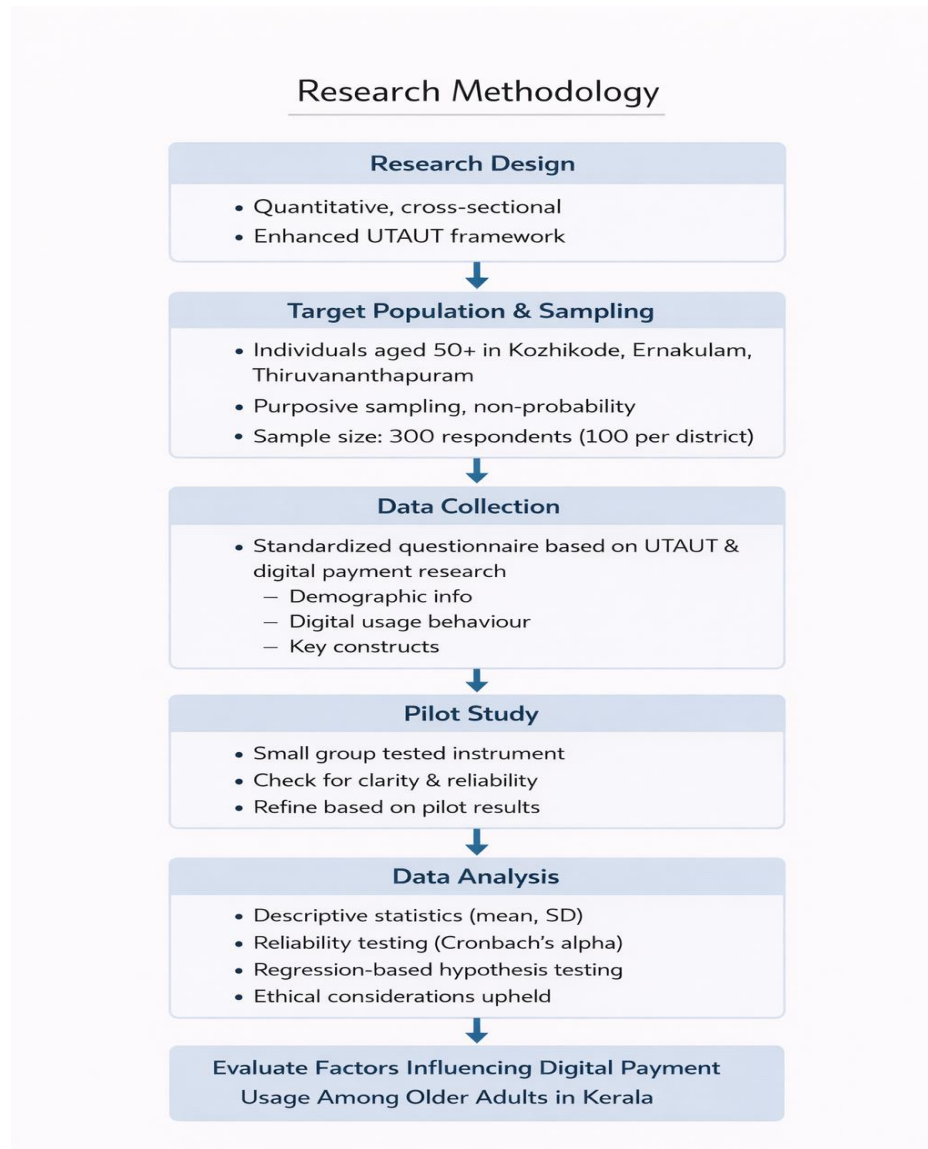


Figure 1. Research methodology framework

Prior to the major data collection, a pilot study is conducted with a small group of respondents to check the clarity, reliability, and relevance of the questionnaire. Necessary improvements are made based on the pilot findings to improve the instrument's validity.

Considering the characteristics of the target demographic, data collection is carried out mostly by face-to-face survey administration. Where appropriate, respondents are provided with support to comprehend the questions, ensuring accurate responses while maintaining the independence of their viewpoints. This strategy lowers response errors coming from misunderstanding or unfamiliarity with survey formats.

The collected data is coded and examined using Datalab statistical software. The study follows a structured approach, beginning with descriptive statistics to summarize respondent characteristics. This is followed by reliability testing using Cronbach's alpha to determine internal consistency of the constructs. Validity assessment is conducted to confirm that the measurement items accurately represent the intended variables. Hypothesis testing is carried out using regression-based analysis, enabling evaluation of the links between performance expectancy, effort expectancy, social influence, facilitating factors, trust, behavioral intention, and actual usage within the broader UTAUT framework.

Ethical considerations are maintained throughout the work. Participation is voluntary, informed consent is requested prior to data collection, and respondents are assured of confidentiality and anonymity. The data collected is used only for academic reasons. This analytical approach provides a systematic and empirically informed basis for evaluating digital payment adoption behaviour among older individuals in Kerala.

Results and Analysis

Data obtained from 300 respondents aged 50 years and above across Kozhikode, Ernakulam, and Thiruvananthapuram were examined in accordance with the suggested expanded UTAUT model. The results are presented systematically, integrating statistical outputs with interpretation.

Table 1: Demographic Profile of Respondents (n = 300)

Variable	Category	Frequency	Percentage (%)
Age	50–60	132	44.0
	61–70	104	34.7
	Above 70	64	21.3
Gender	Male	162	54.0
	Female	138	46.0
Location	Kozhikode	100	33.3
	Ernakulam	100	33.3
	Thiruvananthapuram	100	33.3
Smartphone Usage	Regular	258	86.0
	Occasional	42	14.0
Digital Payment Usage	Regular	96	32.0
	Occasional	128	42.7
	Rare/Never	76	25.3

The demographic distribution reflects balanced regional representation and implies high levels of smartphone usage. However, the proportion of regular digital payment users remains substantially smaller, demonstrating a mismatch between digital access and transactional usage.

Table 2: Descriptive Statistics of Constructs

Construct	Mean	Standard Deviation
Performance Expectancy (PE)	3.92	0.68
Effort Expectancy (EE)	3.21	0.74
Social Influence (SI)	3.45	0.71

Facilitating Conditions (FC)	3.67	0.66
Trust (TR)	3.08	0.79
Behavioural Intention (BI)	3.34	0.72
Actual Usage (AU)	2.98	0.81

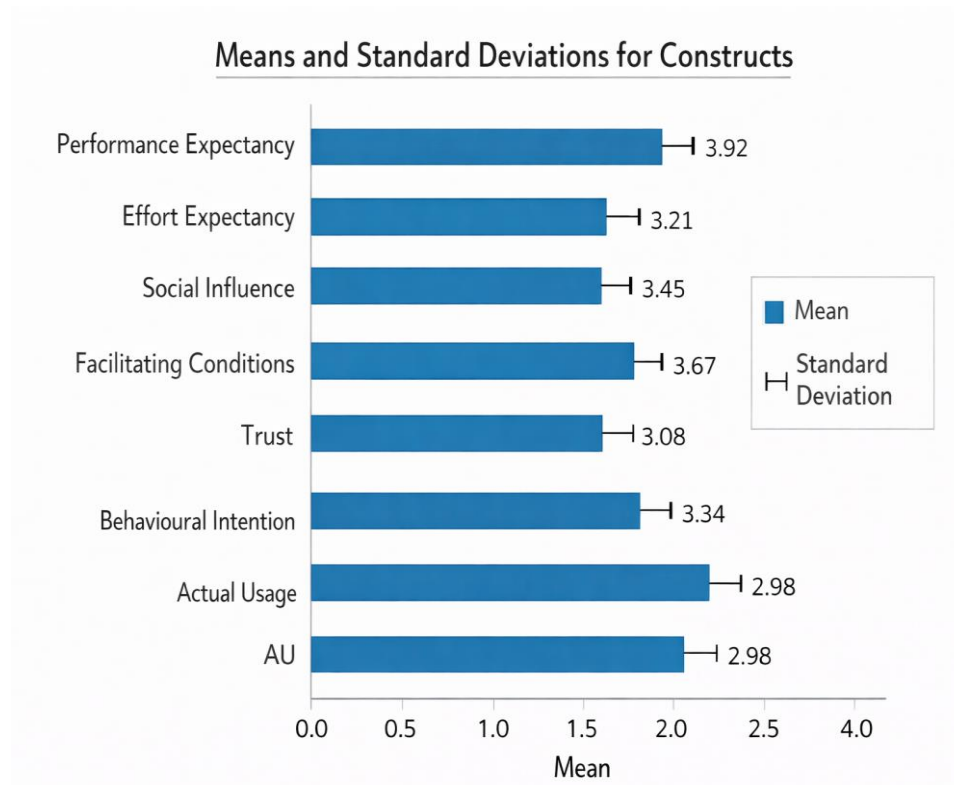


Figure 2. Means and Standard deviations for constructs

The descriptive profile reveals considerably better views of utility and infrastructure support, whereas comparatively lower answers are reported for effort expectation and trust, indicating potential usability and security problems.

Table 3: Reliability Analysis (Cronbach's Alpha)

Construct	Cronbach's Alpha
Performance Expectancy	0.84
Effort Expectancy	0.81
Social Influence	0.78
Facilitating Conditions	0.80
Trust	0.86
Behavioural Intention	0.82

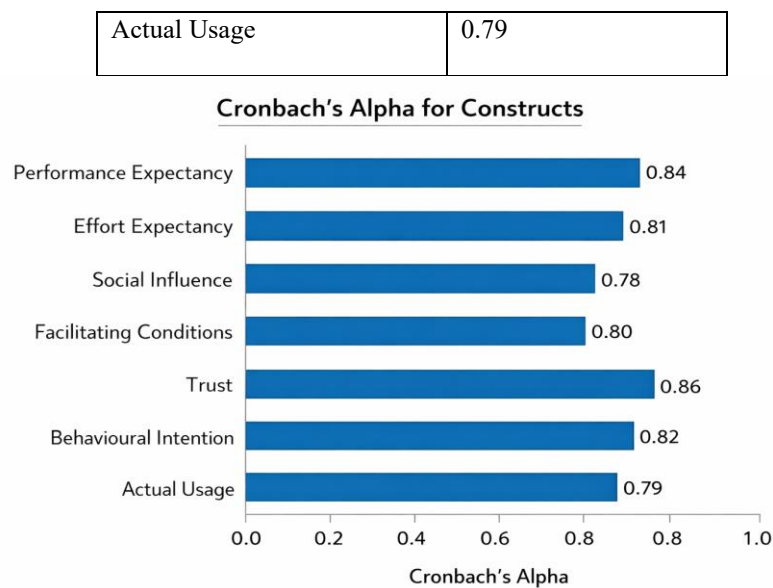


Figure 3. Cronbach's Alpha for constructs

All constructs demonstrate acceptable internal consistency, demonstrating the dependability of the measurement equipment. Data screening further demonstrated appropriate normality conditions, supporting the application of regression analysis.

Table 4: Correlation Matrix

Variables	PE	EE	SI	FC	TR	BI	AU
PE	1						
EE	0.52	1					
SI	0.41	0.46	1				
FC	0.48	0.50	0.44	1			
TR	0.55	0.49	0.42	0.47	1		
BI	0.60	0.58	0.45	0.50	0.68	1	
AU	0.49	0.52	0.39	0.61	0.57	0.65	1

The correlation matrix suggests moderate to strong positive connections among variables, with no indication of multicollinearity.

Table 5: Model Summary

Dependent Variable	R ²	Adjusted R ²
Behavioural Intention	0.62	0.60
Actual Usage	0.48	0.46

The model provides considerable explanatory power for behavioural intention and modest explanatory power for actual usage.

Table 6: Hypothesis Testing Results

Hypothesis	Path	Beta (β)	p-value	Result
H1	PE $\rightarrow$ BI	0.36***	<0.001	Supported
H2	EE $\rightarrow$ BI	0.29**	<0.01	Supported
H3	SI $\rightarrow$ BI	0.18*	<0.05	Supported
H4	FC $\rightarrow$ AU	0.31**	<0.01	Supported
H5	TR $\rightarrow$ BI	0.42***	<0.001	Supported

Note: ***p < 0.001, **p < 0.01, *p < 0.05

The regression analysis demonstrates that all hypothesized associations are statistically significant. Trust appears as the strongest predictor of behavioural intention, followed by performance expectancy and effort expectancy. Social influence, albeit substantial, has a significantly lesser effect, demonstrating that external encouragement alone does not ensure continued adoption.

Facilitating conditions are observed to influence actual usage rather than behavioural intention, suggesting that infrastructural support serves as an enabling mechanism rather than a key driver of adoption.

Table 7: Multicollinearity Assessment (VIF Values)

Variable	VIF
Performance Expectancy	2.1
Effort Expectancy	2.3
Social Influence	1.8
Facilitating Conditions	2.0
Trust	2.4

The VIF values remain within acceptable bounds, showing the absence of multicollinearity and supporting the robustness of the regression model. The results collectively indicate that while older persons demonstrate strong familiarity with digital technology, adoption of digital payment systems is affected more by perceived ease of use and trust than by sheer access or social influence. The findings empirically confirm the enlarged UTAUT concept and demonstrate the persistence of an access–usage gap among the study group.

Discussion

The findings of this study provide vital insights into the factors of digital payment acceptance among older individuals in Kerala, evaluated via the lens of the extended UTAUT model. The results not only support the usefulness of classic technology adoption components but also demonstrate noteworthy differences in their relative significance when applied to an older group (Zhou et al., 2024). More crucially, the findings disclose a clear discrepancy between digital access and actual usage, indicating the prevalence of an access–consumption gap.

A crucial finding of this study is the dominant importance of trust in driving behavioural intention. While current research based on UTAUT and TAM consistently identified performance expectancy as the main predictor, the present findings reveal a shift in priority among older persons. Trust outweighs apparent utility, demonstrating that issues linked to security, privacy, and reliability outweigh practical benefits. This finding agrees with earlier research emphasizing the role of trust in financial technologies, although it significantly extends the literature by indicating that trust is not only a complimentary element but a primary determinant in this cohort (Junior et al.,

2026). This undermines the traditional idea that perceived usefulness alone is sufficient to encourage adoption, particularly in technologically mature societies.

Effort expectancy also appears as a substantial factor of behavioural intention, corroborating the claim that usability remains a critical barrier for older users. While past studies generally report effort expectancy as less significant in people with more digital exposure, the latest data suggest otherwise. Despite increased smartphone usage, elderly persons continue to see digital payment interfaces as difficult and error-prone. This suggests that digital familiarity does not necessarily transfer into confidence in making financial transactions (Han and Ko, 2025). The recurrence of usability concerns underscores a shortcoming in existing technology adoption models, which tend to underestimate the impact of cognitive and experiential obstacles in older groups.

Social influence is demonstrated to have a moderate impact on behavioural intention. This somewhat validates past research that emphasize the significance of peer and family influence in technology adoption. However, the significantly lower effect shown in this study implies that external stimulus alone is insufficient to assure persistent consumption. While family members may facilitate initial exposure to digital payments, continuing usage appears to depend more on individual confidence and perceived control. This conclusion contrasts with research conducted among younger groups, where social influence often plays a bigger role, demonstrating that its effect is context- and demographic-dependent (García-Roldán et al., 2025).

Facilitating situations reveal a considerable effect on actual usage rather than behavioural intention, consistent with the original UTAUT concept. The data demonstrate that access to cell phones, internet connectivity, and technical help enables usage but does not independently influence adoption decisions. This divergence is particularly pertinent in the context of Kerala, where digital infrastructure is rather well developed. The data show that infrastructure preparedness has reached a saturation point, beyond which gains in access produce diminishing returns unless supplemented with behavioural and psychological readiness.

Performance expectancy remained a strong predictor, demonstrating that older persons do comprehend the practical benefits of digital payments. However, its significantly lesser influence relative to trust reflects a transition from utility-driven to risk-sensitive decision-making. This represents a more cautious approach to technology adoption, where perceived risks may exceed perceived benefits. Such a pattern is less obvious among younger or more digitally native populations, underscoring the necessity of demographic-specific study.

Overall, the study contributes to existing literature by indicating that the explanatory value of UTAUT can be greatly boosted via the inclusion of trust, particularly in the context of financial technology and older users (Malik and Sohail, 2025). It also tackles a fundamental gap by experimentally addressing the access–usage split, revealing that digital inclusion cannot be assessed only in terms of access to devices or internet connectivity.

The findings underline the need to move beyond infrastructure-centric approaches and focus on user-centric design, trust-building processes, and streamlined interfaces. By stressing the interplay between usability, trust, and behavioral intention, the study gives a more complex view of digital payment acceptance among older persons, with implications for both theory and practice.

Practical Implications:

Digital payment acceptance among older persons demands user-centric solutions. Applications should offer simple, intuitive interfaces with obvious navigation, larger text, and guided instructions to reduce errors. Community-level training programs, especially via local organizations and banks, can develop confidence and overcome the access–usage divide. Trust-building is crucial; suppliers must stress security measures, fraud protection, and clear grievance systems to reduce perceived risk.

Theoretical Implications

The study extends UTAUT by adding trust as a major predictor, indicating psychological aspects exceed functional ones among older persons. It emphasizes constraints of generic models and demonstrates the need for context-specific variables to better explain adoption behaviour.

Limitations

Findings are limited to three districts in Kerala, with purposeful selection and a cross-sectional methodology constraining generalizability, causal inference, and behavioural change analysis over time.

Future Research

Further research should encompass other Indian states, incorporate variables like risk, digital literacy, and culture, and utilize longitudinal designs for deeper insights.

Conclusion

Despite strong availability, older persons display inconsistent digital payment usage, showing an access–usage divide. Trust is the largest predictor, followed by effort and performance expectancy; social influence is minor, while facilitating situations favor usage. The report recommends shifting from infrastructure to user readiness, emphasizing usability and trust for inclusive adoption.

Conflict of Interest

The author declare that there is no conflict of interest regarding the publication of this study.

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