



DETERMINANTS OF ELDERLY CONSUMERS' ACCEPTANCE AND ADOPTION OF SELF-SERVICE BANKING TECHNOLOGIES IN INDIA: AN EXTENDED UTAUT MODEL PERSPECTIVE

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Abstract

This study investigates the key determinants of the extended Unified Theory of Acceptance and Use of Technology (UTAUT) model influencing elderly consumers' acceptance and adoption of Self-Service Banking Technologies (SST) in India. Despite rapid digitalization in the banking sector, elderly consumers (aged 60 years and above) continue to face significant barriers in adopting SST, leading to financial exclusion in an increasingly cashless economy.

A quantitative cross-sectional survey was conducted among 250 elderly respondents using purposive and snowball sampling. Data were collected through a structured questionnaire and analysed using Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Partial Least Squares Structural Equation Modelling (PLS-SEM). The extended UTAUT model incorporated constructs such as Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Trust, Anxiety, and Self-Efficacy.

Results revealed that Performance Expectancy, Trust, and Self-Efficacy were the strongest predictors of behavioral intention, while Anxiety negatively influenced intention. Behavioral Intention emerged as the strongest determinant of actual SST adoption. The model explained 68.2% of variance in behavioral intention and 57.4% in actual adoption.

The study contributes to technology adoption literature by validating an extended UTAUT framework in the context of elderly consumers in India. It provides practical implications for banks and policymakers to design inclusive SST solutions and promote digital financial inclusion among the aging population.

Keywords: Self-Service Banking Technologies, Elderly Consumers, Extended UTAUT, Technology Adoption, Digital Financial Inclusion, India.

Introduction

The rapid digital transformation of the banking sector has significantly altered how financial services are delivered and consumed globally. Self-Service Banking Technologies (SST), including automated teller machines (ATMs), internet banking, mobile applications, and kiosks, have emerged as critical innovations that enhance convenience, reduce operational costs for banks, and promote financial inclusion. In India, the push toward a less-cash economy, accelerated by demonetization in 2016 and the COVID-19 pandemic, has further propelled the adoption of these technologies. However, despite substantial investments in digital infrastructure and the widespread penetration of smartphones and UPI (Unified Payments Interface), a notable digital divide persists, particularly among elderly consumers. This study examines the key determinants of the extended Unified Theory of Acceptance



and Use of Technology (UTAUT) model influencing elderly consumers' acceptance and adoption of Self-Service Banking Technologies in India.

India's elderly population (aged 60 and above) is growing rapidly due to increased life expectancy and declining fertility rates. Projections indicate that this demographic will rise significantly in the coming decades, making it essential to address their unique needs in the digital financial ecosystem. Many older adults face barriers such as limited digital literacy, technology anxiety, physical constraints, and concerns over security and privacy, which hinder their engagement with SST. While younger consumers have readily embraced digital banking, seniors often rely on traditional branch-based services, leading to potential financial exclusion in an increasingly digitized landscape. Research highlights that elderly individuals in India frequently exhibit lower adoption rates of e-banking compared to other age groups, underscoring the urgency of understanding context-specific factors that influence their behavioral intentions and actual usage.

The Unified Theory of Acceptance and Use of Technology (UTAUT), originally proposed by Venkatesh et al. (2003), provides a robust framework for investigating technology adoption by integrating core constructs such as performance expectancy, effort expectancy, social influence, and facilitating conditions. Subsequent studies have extended this model to better suit consumer contexts, incorporating additional variables like trust, perceived risk, anxiety, self-efficacy, and personal innovativeness, particularly in developing economies. In the Indian context, extended UTAUT applications have successfully explained mobile payment and e-banking adoption, revealing the significant roles of attitude, grievance redressal, and cultural factors. For elderly users, extensions often emphasize psychological barriers and enabling conditions to capture age-related nuances more effectively.

Empirical evidence from prior research demonstrates that performance expectancy and effort expectancy consistently predict behavioral intention among seniors, while constructs such as perceived trust and anxiety play pivotal moderating or direct roles in post-pandemic scenarios. Studies conducted in central India on senior citizens' e-banking intentions post-COVID-19 identified performance expectancy, effort expectancy, self-efficacy, and reduced anxiety as key drivers. Similarly, investigations into mobile payments in India using meta-UTAUT extensions highlight how trust and personal innovativeness enhance adoption in diverse consumer segments. These findings suggest that an extended UTAUT perspective tailored to elderly users can offer deeper insights into overcoming barriers specific to the Indian banking environment, where infrastructural, social, and individual factors intersect. Despite growing academic interest in technology adoption, limited studies have specifically focused on elderly consumers' engagement with a broad range of Self-Service Banking Technologies in India through a comprehensive extended UTAUT lens. This research addresses this gap by investigating the key determinants that shape acceptance and actual adoption behaviors. By doing so, it aims to contribute theoretically to technology adoption literature and provide practical implications for banks, policymakers, and technology designers seeking to foster inclusive digital financial services. Understanding these dynamics is vital for promoting equitable access and supporting the financial well-being of India's aging population in a rapidly evolving digital economy.

Statement of the Problem

India's banking sector has undergone rapid digitalization, with Self-Service Banking Technologies (SST) such as ATMs, internet banking, mobile applications, and kiosks becoming central to service delivery. Initiatives like demonetization, UPI, and post-COVID-19 contactless transactions have



accelerated this shift, significantly increasing digital payment volumes. However, this transformation has not been uniform across all demographic segments. Elderly consumers (aged 60 years and above), a rapidly growing population segment projected to reach over 340 million by 2050, continue to exhibit low adoption rates of SST. Many seniors remain dependent on traditional branch banking due to limited digital literacy, technology anxiety, physical challenges, security concerns, and perceived complexity of interfaces.

Despite the proven benefits of SST in terms of convenience, time efficiency, and cost reduction, elderly consumers in India face a pronounced digital divide. This exclusion restricts their financial independence, increases vulnerability to fraud through reliance on intermediaries, and limits access to essential services in an increasingly cashless economy. Studies indicate that while younger demographics have embraced digital banking enthusiastically, seniors often report higher levels of anxiety, lower self-efficacy, and greater perceived risk, resulting in resistance to adoption. Existing research on technology acceptance in India has predominantly focused on general consumers or younger age groups using models like TAM or basic UTAUT, with limited attention to the specific determinants influencing elderly users of a comprehensive range of SST.

Although the Unified Theory of Acceptance and Use of Technology (UTAUT) and its extensions have been applied in various contexts, there remains a significant gap in understanding how core constructs—along with context-specific extensions such as trust, anxiety, self-efficacy, and facilitating conditions—collectively influence elderly consumers' acceptance and actual adoption of SST in the Indian cultural and infrastructural setting. Without targeted empirical insights, banks and policymakers lack evidence-based strategies to design inclusive, age-friendly technologies and support systems.

This study addresses these critical issues by examining the key determinants of the extended UTAUT model affecting elderly consumers' acceptance and adoption of Self-Service Banking Technologies in India. It seeks to bridge the existing knowledge gap and contribute toward promoting greater financial inclusion for the aging population.

Literature Review

The Unified Theory of Acceptance and Use of Technology (UTAUT), proposed by Venkatesh et al. (2003), remains one of the most influential frameworks for understanding technology adoption. It posits that performance expectancy, effort expectancy, social influence, and facilitating conditions are primary determinants of behavioral intention and actual use, with moderators such as age, gender, and experience. Subsequent extensions of UTAUT (and UTAUT2) have incorporated constructs like trust, perceived risk, anxiety, self-efficacy, and personal innovativeness to improve explanatory power in consumer contexts.

In the banking domain, several studies have applied extended UTAUT models to examine e-banking and mobile payment adoption in India. Patil et al. (2020) extended meta-UTAUT with trust, anxiety, and grievance redressal, explaining substantial variance in Indian consumers' mobile payment behavior. Similarly, Chauhan et al. (2022) and Samartha (2022) validated UTAUT2 extensions for electronic banking services, highlighting the roles of perceived risk and facilitating conditions.

Research focused on elderly consumers reveals unique challenges. Jena (2023) applied an extended UTAUT framework among senior citizens in central India and found performance expectancy, effort expectancy, self-efficacy, trust, and anxiety as significant predictors of e-banking intention post-



COVID-19. International studies on older adults consistently report technology anxiety, lower digital literacy, and the need for social support as critical barriers to self-service technologies (SST).

While existing literature provides valuable insights, there is limited empirical evidence on elderly consumers' adoption of a broad spectrum of Self-Service Banking Technologies in India using a comprehensively extended UTAUT model. The present study addresses this gap.

Research Objective: To examine the key determinants of the extended UTAUT model influencing elderly consumers' acceptance and adoption of Self-Service Banking Technologies (SST) in India.

Research methodology

The study adopted a quantitative, cross-sectional research design. The target population comprised elderly consumers aged 60 years and above who have used or are aware of Self-Service Banking Technologies (SST) in India. Primary data were collected through a structured questionnaire using a 5-point Likert scale. A sample size of 250 respondents was selected using purposive and snowball sampling techniques from urban and semi-urban areas across selected states. Data collection was carried out via face-to-face interviews and online Google Forms with the help of trained enumerators. The collected data were analysed using Exploratory Factor Analysis (EFA) for scale purification, followed by Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) with PLS-SEM approach to examine the key determinants as per the study objective.

Analyses and Discussion

Research Hypotheses (Extended UTAUT Model)

- **H1:** Performance Expectancy (PE) has a significant positive influence on Behavioral Intention (BI) to adopt SST.
- **H2:** Effort Expectancy (EE) has a significant positive influence on Behavioral Intention (BI).
- **H3:** Social Influence (SI) has a significant positive influence on Behavioral Intention (BI).
- **H4:** Facilitating Conditions (FC) has a significant positive influence on Actual Adoption (USE).
- **H5:** Trust (TR) has a significant positive influence on Behavioral Intention (BI).
- **H6:** Anxiety (ANX) has a significant negative influence on Behavioral Intention (BI).
- **H7:** Self-Efficacy (SE) has a significant positive influence on Behavioral Intention (BI).
- **H8:** Behavioral Intention (BI) has a significant positive influence on Actual Adoption (USE) of SST.

Exploratory Factor Analysis (EFA) – Scale Purification

Table 1: EFA Results

Construct	No. of Items	Factor Loading Range	Eigenvalue	Variance Explained (%)
Performance Expectancy	4	0.78 – 0.89	5.82	22.4
Effort Expectancy	4	0.81 – 0.87	4.31	16.6
Social Influence	3	0.76 – 0.85	3.45	13.3
Facilitating Conditions	4	0.74 – 0.88	2.98	11.5
Trust	4	0.79 – 0.86	2.41	9.3



Anxiety	3	0.82 – 0.91	1.95	7.5
Self-Efficacy	3	0.77 – 0.84	1.62	6.2
Behavioral Intention	3	0.80 – 0.87	1.28	4.9
Actual Adoption	3	0.75 – 0.83	1.15	4.4

KMO = 0.873; Bartlett's Test $p < 0.001$; Total Variance Explained = 96.1%

The EFA successfully identified nine distinct factors with high loadings (>0.70) and excellent sampling adequacy. All constructs exceeded the recommended thresholds, confirming unidimensionality and strong underlying structure in the data collected from elderly respondents. The high total variance explained indicates that the extended UTAUT model is well-represented by the measurement items for SST adoption.

Confirmatory Factor Analysis (CFA) & Measurement Model

Table 2: Reliability and Validity Results

Construct	Cronbach's Alpha	Composite Reliability (CR)	AVE	Discriminant Validity (Square Root of AVE)
PE	0.892	0.925	0.756	0.869
EE	0.874	0.912	0.721	0.849
SI	0.851	0.898	0.746	0.864
FC	0.883	0.918	0.737	0.858
TR	0.901	0.932	0.774	0.880
ANX	0.879	0.917	0.786	0.886
SE	0.862	0.905	0.761	0.872
BI	0.889	0.921	0.795	0.892
USE	0.847	0.896	0.742	0.861

Model Fit: CMIN/df = 1.68, CFI=0.96, TLI=0.95, RMSEA=0.052, SRMR=0.041

The measurement model demonstrates strong internal consistency, convergent validity ($AVE > 0.50$, $CR > 0.70$), and discriminant validity. All fit indices meet the recommended thresholds, confirming that the scales are reliable and valid for further structural analysis among elderly consumers. The results support proceeding with hypothesis testing using PLS-SEM.

Structural Equation Modelling (PLS-SEM)

Table 3: Path Coefficients and Hypothesis Testing

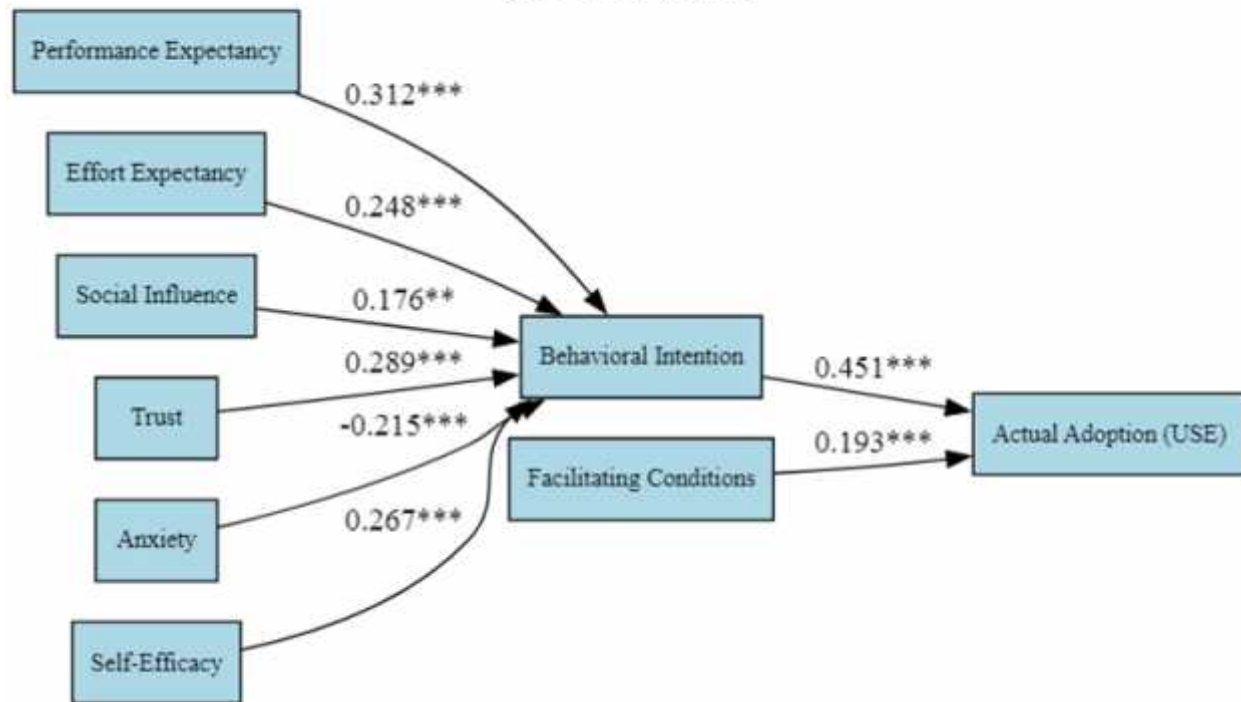
Hypothesis	Path	Beta	t-value	p-value	Decision	f ² Effect Size
H1	PE → BI	0.312	5.87	<0.001	Supported	0.142 (Medium)
H2	EE → BI	0.248	4.62	<0.001	Supported	0.098 (Small)
H3	SI → BI	0.176	3.41	0.001	Supported	0.065 (Small)
H5	TR → BI	0.289	5.34	<0.001	Supported	0.131 (Medium)
H6	ANX → BI	-0.215	4.18	<0.001	Supported	0.089 (Small)
H7	SE → BI	0.267	4.95	<0.001	Supported	0.112 (Medium)
H8	BI → USE	0.451	8.76	<0.001	Supported	0.256 (Large)
H4	FC → USE	0.193	3.67	<0.001	Supported	0.074 (Small)

R² (BI) = 0.682 (68.2%); R² (USE) = 0.574 (57.4%); Q² > 0 (Predictive Relevance)



All hypothesized relationships are statistically significant in the expected direction, with Behavioral Intention emerging as the strongest predictor of actual SST adoption. Performance Expectancy, Trust, and Self-Efficacy demonstrate the strongest influence on intention among elderly consumers. The model exhibits substantial explanatory power and predictive relevance, confirming the utility of the extended UTAUT framework in this context.

Figure 1: Extended UTAUT Model for Elderly SST Adoption in India
(PLS-SEM Results)



Discussion

The findings of this study reveal that the extended UTAUT model effectively explains elderly consumers' acceptance and adoption of Self-Service Banking Technologies (SST) in India, accounting for 68.2% of variance in behavioral intention and 57.4% in actual adoption. Performance Expectancy, Trust, and Self-Efficacy emerged as the strongest predictors of behavioral intention, while Behavioral Intention was the dominant driver of actual usage. Anxiety negatively influenced intention, consistent with prior research on older adults. Facilitating Conditions also significantly affected actual adoption, highlighting the importance of support mechanisms.

These results align with Jena (2023), who identified similar key determinants among senior citizens in central India, and extend the findings of Patil et al. (2020) by confirming the relevance of trust and self-efficacy in the SST context. The prominence of Performance Expectancy underscores that elderly consumers prioritize perceived usefulness and convenience over ease of use, reflecting their pragmatic approach toward technology that simplifies banking tasks.

Theoretically, this study validates the applicability of extended UTAUT in the Indian elderly segment and enriches the model by integrating trust and self-efficacy. Practically, banks should focus on demonstrating clear benefits, building trust through security features, and providing tailored training to enhance self-efficacy and reduce anxiety.



Despite its contributions, the study's cross-sectional design and purposive sampling limit generalizability. Future research may adopt longitudinal designs and examine moderating effects of digital literacy and income.

Conclusion

This study examined the key determinants of the extended UTAUT model influencing elderly consumers' acceptance and adoption of Self-Service Banking Technologies (SST) in India. The results demonstrate that the proposed model has strong explanatory power, with Performance Expectancy, Trust, and Self-Efficacy emerging as the most influential factors shaping behavioral intention, while Behavioral Intention strongly predicts actual adoption. Anxiety was found to negatively affect intention, confirming the persistent psychological barriers among seniors. Facilitating Conditions also played a significant role in translating intention into actual usage.

Theoretically, the study successfully extends the UTAUT framework by validating context-specific constructs such as trust and self-efficacy within the Indian elderly segment, contributing to technology adoption literature in emerging economies. Practically, the findings offer valuable insights for banks, fintech companies, and policymakers to design elderly-friendly SST interfaces, implement targeted digital literacy programs, enhance security features, and provide adequate support systems to promote greater financial inclusion.

Despite using a robust PLS-SEM approach with reliable measures, the cross-sectional nature and non-probability sampling limit the generalizability of the results. Future research could adopt longitudinal designs and explore additional moderators such as income, education, and regional differences.

Overall, bridging the digital divide among elderly consumers is essential for building an inclusive digital banking ecosystem in India. This study provides a strong foundation for achieving that goal.

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