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MODELING THE PREDICTORS OF M-PAYMENTS ADOPTION FOR INDIAN RURAL TRANSFORMATION

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ABSTRACT

Aim/Purpose	The last decade has witnessed a tremendous progression in mobile penetration across the world and, most importantly, in developing countries like India. This research aims to investigate and analyze the factors influencing the adoption of mobile payments (M-payments) in the Indian rural population. This, in turn, would bring about positive changes in the lives of people in these countries.
Background	A conceptual framework was worked upon using UTAUT as a foundation, which included constructs, namely, facilitating conditions, social influences, performance expectancy, and effort expectancy. The model was further extended by incorporating the awareness construct of m-payments to make it more comprehensive and to understand behavioral intentions and usage behavior for m-payments in rural India.
Methodology	A questionnaire-based study was conducted to collect primary data from 410 respondents residing in rural areas in the state of Punjab. Convenience sampling was conducted to collect the data. Structural equation modeling was used to conduct statistical analysis, including exploratory and confirmatory factor analyses.
Contribution	A new conceptual model for M-payments adoption in rural India was developed based on the study's findings. Using the findings of the study, marketers, policymakers, and academicians can gain insight into the factors that motivate the rural population to use M-payments.
Findings	The study has found that M-payment Awareness (AW) is the strongest factor within the proposed model for deeper diffusion of M-payments in rural areas in

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	the state of Punjab. Performance expectancy (PE), effort expectancy (EE), social influences (SI), and facilitating conditions (FC) are also positively and significantly related to behavioral intentions for using M-payments among the Indian rural population in the state of Punjab.
Recommendations for Practitioners	M-payments are emerging as a new mode of transactions among the Indian masses. The government needs to play a pivotal role in advocating the benefits linked with the usage of M-payments by planning financial literacy and awareness campaigns, promoting transparency and accountability of the intermediaries, and reducing transaction costs of using M-payments. Mobile manufacturing companies should come up with devices that are easy to use and incorporate multilanguage mobile applications, especially for rural areas, as India is a multilingual country. A robust regulatory framework will not only shape consumer trust but also prevent privacy breaches.
Recommendations for Researchers	It is recommended that a comparative study among different M-payment platforms be conducted by exploring constructs such as usefulness and ease of use. However, the vulnerability of data leakage may result in insecurity and skepticism about its adoption.
Impact on Society	India's rural areas have immense potential for adoption of M-payments. Appropriate policies, awareness drives, and necessary infrastructure will boost faster and smoother adoption of M-payments in rural India to thrive in the digital economy.
Future Research	The adapted model can be further tested with moderating factors like age, gender, occupation, and education to understand better the complexities of M-payments, especially in rural areas of India. Additionally, cross-sectional studies could be conducted to evaluate the behavioral intentions of different sections of society.
Keywords	UTAUT, rural India, facilitating conditions, social influences, performance expectancy, effort expectancy, M-payments awareness, behavioral intentions, usage behavior

INTRODUCTION

The Internet in the banking sector offers the possibility of delivering banking services through electronic channels. These electronic channels provide alternatives for faster delivery of banking services to a wider scope of customers. Approximately 78% of India's total population was connected to mobile phones in early 2024, with1.12 billion active mobile connections (Kemp, 2024). According to the Nielsen Report (2022), over 425 million rural Indians had access to the Internet, which is four times more than urban users. More than half of the population now uses smartphones, and there has been an increase of 45% in Internet users since 2019, placing rural India at the center of the world's smartphone revolution (Telecom Regulatory Authority of India, 2024). Internet penetration via smartphones in rural India is growing in double digits, mainly to adopt Fintech, e-health, and e-learning, thus bridging the divide between urban and rural India (Indian Council for Research on International Economic Relations, 2023). Use of mobile payments (M-payments) mainly refers to financial transitions conducted using mobile communication technology (Koenig-Lewis et al., 2015). It surpasses the benefits of the traditional banking system by providing ubiquitous benefits in greater efficiency, improved security, and accessibility, which are particularly valuable in rural settings. With the advent of tech-savvy banks and the inroads made by foreign banks in the Indian market, the outreach of digitalization in the financial sector regarding behavioral intention and use behavior has been completely changed (Sharma et al., 2019). Financial institutions need to nail it to gain market share and

profitability by meeting the customers' expectations (Wali & Nwokah, 2018). The Internet and Mobile Association of India and Kantar (2024) joint report indicates that the digital penetration rate across the country will exceed 55% in 2023, surpassing 820 million active internet users. Interestingly, more than half of the total user base comes from rural areas, which indicates widespread adoption of digital technologies outside urban areas. These figures frame a clearer picture regarding the huge scope for digital payments across small towns and villages in Indian rural areas. Fintech firms and government initiatives have stepped into empowering rural businesses digitally and financially. Companies have come up with novel solutions, especially catering to the needs and wants of the communities based in villages. They came up with innovative strategies such as leveraging their network of Aadhaar Enabled Payment System and ATMs at retail points to help users carry out transactions, launching mobile vans with inbuilt mini-ATMs and bill payment kiosks, handheld point-of-sale machines, and sound wave technology-based payments, to name a few. India is the second-largest telecommunication market (Telecom Regulatory Authority of India, 2023), and approximately 65% of the mobile user population in India use a smartphone, which is a prerequisite for M-payments. Ironically, users in rural areas lack basic digital literacy, relying on traditional instruments such as cheques, cash withdrawals, etc. (Sabri et al., 2023). So, this entails us to examine and understand the role of M-payment technology in the Indian rural ecosystem.

Rural India and M-payments

In the Indian context, the rural sector is predominantly an agrarian economy where cash is the de facto mode of payment (Cnaan et al., 2023; Desai & Joshi, 2014). Despite its potential, M-payments are still a new concept in India (Sharma & Mishra, 2023). However, recent statistics have shown that digital transitions are gaining momentum in rural areas at a very snail's pace (Mittal & Mehar, 2016). When the demonetization wave hit our nation in November 2016, financial institutions geared up with innovative online platforms like e-Wallets, Unified Payments Interface, Bharat QR Code, Aadhaar Enabled Payment System, among others, to make banking easier and user friendly for rural community (Deloitte, 2016). These staggering facts led to a springboard effect in terms of faster adoption of a cashless system in the Indian economy. Despite this, rural India is still well behind its urban counterparts, not only in terms of Internet diffusion but also in Internet usage, particularly in online payments. This may be because of the paucity of necessary infrastructure in the shape of erratic electricity problems, poor quality of the network, expensive internet service plans, and inappropriate usage knowledge (KPMG, 2019). However, fast-changing demographics coupled with increased awareness levels have readily changed the landscape of financial transactions in rural India (Anwar et al., 2023). A growing number of businesses are using mobile commerce and M-payment services to facilitate their business transactions (Akanferi et al., 2022). PricewaterhouseCoopers (2022) validates that the rural population scores very low on digital and financial literacy. ICUBE (2022) validates that approximately only 36% of the rural population uses the Internet to access their financial transactions. However, rural masses widely use the Internet either for communication purposes, social media, or entertainment purposes only (McKinsey Global Institute, 2019). Thus, the purpose of usage is skewed, and the uptake of digital payments remains a distant dream in rural India, thereby diluting its utility manifolds. However, a number of studies on M-payments in rural hinterlands, both from the government and the personal front, have failed chiefly due to a lower level of acceptance from users (Liébana-Cabanillas et al., 2017). It is expected that M-payments would show an upward trajectory fueled by the availability of low-cost smartphones, supportive regulatory regulations, increasing internet network coverage, affordable mobile tariffs, and a thriving, innovative Fintech ecosystem would provide much-needed impetus, unprecedented opportunities, and growth avenues for rural population (Sindakis & Showkat, 2024). So, the rationale for conducting this study was to gauge the level of acceptance in rural hinterlands along with enumerating the enablers and inhibitors of behavioral intentions and usage behavior for M-payments.

THEORETICAL BACKGROUND

The majority of past research conducted extensively utilized the Technology Acceptance Model (TAM) proposed by renowned researcher, Davis (1989), to predict technology adoption behavior in various domains of knowledge (Dendrinos & Spais, 2023; Mohapatra et al., 2020). However, the current study stems from the Unified of Acceptance and Use of Technology (UTAUT) model proposed by eminent researcher Venkatesh et al. (2003). UTAUT is a refined version of TAM. Moreover, eight prominent adoption theories have been analyzed and empirically validated in this model, resulting in the framing of one comprehensive model. Apart from this, it has been widely cited by researchers in elucidating the information-searching behavior linked with new technology (Dwivedi et al., 2019; Kim et al., 2010; Liu et al., 2012). This helps reduce post-purchase dissonance through the careful evaluation of various parameters associated with a particular decision (Graff et al., 2012). Empirical evidence substantiates the use of the UTAUT model to understand the adoption of M-payment (Chen & Chang, 2013; Shin, 2009). Thus, UTAUT is considered a rationally viable theoretical model to access the behavioral intention and use behavior of the rural population towards M-payments in India as well. For a robust and comprehensive understanding of M-payments in rural areas, we synthesized a model clubbing one important construct, i.e., M-payment awareness in the existing UTAUT model.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Executing and propagating the use of new technology to the masses affects the user in numerous ways, and its accomplishment in many fields is dependent upon the individual's criteria for its acceptance or rejection. So, the following paragraphs present an extensive review of various constructs in the conceptual model.

PERFORMANCE EXPECTANCY

Performance expectancy (PE) is defined as the major antecedent that determines which stimulus triggers an individual's intention to use a new technological innovation (Venkatesh et al., 2003). M-payments go beyond temporal and spatial limitations and aid in gaining information or services at anytime from anywhere (Halder et al., 2018). However, from the perspective of our present research, it is considered as the extent to which the rural population perceives it is to be beneficial to use M-payments and increase their productivity in the longer run (Yusfiarto et al., 2023). Tan et al. (2024) strongly advocated in this research that an individual willingly embraces new technology if it is easy to use, learn, and implement. PE has been stated as an extrinsic motivator that acts as a key decisive indicator for the acceptance of a new information system, i.e., M-payments (Alalwan et al., 2016; Tamilmani et al., 2021; Thakur & Srivastava, 2014; Yaseen et al., 2022). Moreover, it has also been taken as a critical antecedent of behavioral intention toward mobile apps and m-commerce (Baabdullah et al., 2019; Oyewole, 2018; Rahi et al., 2018). For ages, the Indian rural masses have been accustomed to doing cash transactions (Guerin & Kumar, 2017). Moreover, there is a lack of needs-based products and services that provide one-stop solutions to their financial needs at an affordable cost (Shen et al., 2019). Thus, education towards the advantages linked with M-payments along with instant gratification would be instrumental in shifting their preference towards M-payments. Therefore, we proposed:

H1: Performance expectancy positively influences behavioral intentions to use M-payments.

EFFORT EXPECTANCY

Venkatesh et al. (2003) clearly defines effort expectancy (EE) as the degree of comfort and effortlessness linked with the use of a given technology that readily provides impetus to the usage of that technology. However, it also helps in assessing the pretechnological adoption behavior of the masses. EE facilitates the ease of picking up a new technology-led innovation (Kurfalı et al., 2017; Venkatesh et

al., 2003). However, a review of the literature validates that complex technologies often face stern resistance from the masses (Laukkanen, 2016; Ram & Sheth, 1989; Venkatesh & Zhang, 2010). On the contrary, Leong et al. (2013) acknowledged that ease of usage in technology results in an upsurge in the adoption rate among individuals. Slade et al. (2015) eventually endorsed that EE stimulates the choice to accept M-payments easily and swiftly as rural India is still in the nascent phase of technology acceptance. Thus, it is believed that they would accept the use of M-payments willingly if endorsed with minimal effort. Moreover, the comfort of using it probably would further impact their fondness to accept new technology and eventually result in swapping to M-payments from their conventional cash-based payment system (Sharma & Chopra, 2019). On the other hand, complexity in usage would result in discomfort for the consumer (Upadhyay & Chattopadhyay, 2015). Often, consumers are reluctant to use self-service banking such as M-payments because they are uncomfortable with the technological interface, which they consider to be quite unfriendly and non-customer-centric (Kumar et al., 2017). Moreover, M-payment service providers face the daunting task of designing services that are easy to use, effective, and secure but reliable as well (Koenig-Lewis et al., 2015; Oyewole, 2018). It is also anticipated that if rural people encounter any trouble while dealing with M-payments, there is a fair probability that they might refrain from accepting the technology in the long run (Chan et al., 2022). Hence, we hypothesize that:

H2: Effort expectancy positively influences behavioral intentions to use M-payments.

Social Influences

Social influences (SI) are outlined as an integral dimension of the UTAUT model that supports users in adopting and using new information technology quickly (Tarhini et al., 2016). It is basically a study of consumer behavior that rests upon the perception of the person's reference group's acceptance of technology. It is a deeply grounded fact that family, friends, and peer groups often act as change agents for society (Koenig-Lewis et al., 2015; Zhou et al., 2010). People are often susceptible to social influences as they want to have consonance between their own beliefs and the beliefs held by others (Setterstrom et al., 2018). Kalinic et al. (2019) supported the fact that the social environment deeply affects behavioral intention to either embrace or shun new technology. Adapa and Roy (2017) illustrate that individuals perceive reference groups as pushing them to get accustomed to new technology. It is presumed that people in rural settings are often triggered by societal norms. Moreover, there is no denying the fact that rural masses are not too exposed to apt information as a major chunk of the population is illiterate. They often discuss within their social groups to find solutions to any apprehensions linked with the risk of adopting new technology (Roy et al., 2017; Sharma & Chopra, 2020). This societal web of relationships has a long-lasting effect on readiness to accept or reject innovative technology (Sarkar et al., 2018). The rural population in India is still illiterate and has ample social participants in a social group, so they need to abide by and be compliant with the decisions taken in those discussions. Thus, we assert that:

H3: Social influences positively influence behavioral intentions to use M-payments.

Facilitating Conditions

Facilitating conditions (FC) are well defined by Venkatesh et al. (2003) as the extent to which a person considers that there are ample resources to support and reinforce the usage of new technology. They are perceived enablers in the ecosystem that affect an individual's perception of ease linked with accomplishing a particular task and swift diffusion of innovation (Mahardika et al., 2019). These facilitators in the environment shape the act to be more conducive, easy to perform, and learn the usage in the shortest span with minimal complications encountered (Alalwan et al., 2016). Potential adaptors, particularly during the initial stage, always seek assistance from their reference group while accepting innovative technology. They might be hesitant to embrace the same owing to the dearth of facilitating know-how (Cimperman et al., 2016; Tan et al., 2024). In the context of rural areas, M-payments, if backed by digital infrastructural setups such as interoperable systems, smartphones, feature phones, steady electric power supply, regulatory compliance, and internet facilities along with

appropriate knowledge to use them, could do wonders in fostering transparency and usage of M-payments (Sharma & Govindaluri, 2014). Thus, we hypothesized:

H4: Facilitating conditions positively influence behavioral intentions to use M-payments.

M-Payment Awareness

In the pretext of current research, the concept of M-payment awareness (AW) denotes the knowledge, prudence, and information that the user already has pertaining to the accessibility of M-payment services, the procedure to be undertaken for its usage, perceived advantages and risks linked with M-payments (Sharma & Govindaluri, 2014; Sharma et al., 2019). AW has been quoted as an essential antecedent that helps users in easy and quick acceptance of internet-based banking facilities (Kaur & Arora, 2023; Kim et al., 2010; Pikkarainen et al., 2004; Sathye, 1999; Shaw, 2014). On the flip side, lack of awareness results in poor diffusion and low adoption of M-payment services (Rouvinen, 2006). Due to a lack of financial literacy, the high digital divide, and alienation from banking habits among rural masses, it becomes an utmost important mission of government and financial institutions for the popularization of M-payments (Barik & Sharma, 2019). Moreover, functional illiteracy is quite prevalent in rural inhabitants, along with a lack of understanding of products and their usage methods (Sarkar & Kundu, 2019). However, recent statistics also validate that banks and e-services are increasingly following the practice of highlighting the advantages of using M-payments that can be availed by the user just at the click of a button (Sharma & Sharma, 2019). So, we hypothesized that:

H5: M-payments awareness positively influences behavioral intentions to use M-payments.

Behavioral Intention to Use and Actual Use Behavior

Behavioral intention focuses on an individual's subjective probability of undertaking a particular task (Fishbein & Ajzen, 1975). On the other hand, actual use or usage behavior revolves around the accumulated determined efforts of an individual, keeping his attitude, social norms, and habits intact (Baptista & Oliveira, 2015; Siyal et al., 2024) towards a specific work. However, in the pretext of rural areas, the diffusion of smartphones and mobile telephony is already intertwined in users' lives, which mirrors their willingness to use this technology for personal gains. Based on the review of relevant literature from both national and international perspectives, it is clear that people have actually embraced the usage of M-payments. Thus, we propose:

H6: Behavioral intention positively influences actual use behavior for M-payments.

Based on the review of relevant literature, a conceptual model for this study was proposed (Figure 1).

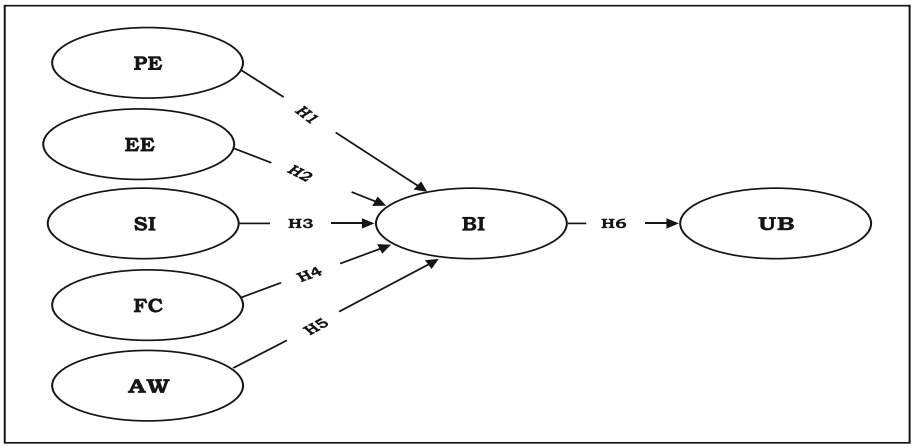

Figure 1. Conceptual framework

RESEARCH METHODOLOGY

To carry out the research study, a systematic model and procedure was adopted. A descriptive research design based on the survey method was used to gain a comprehensive understanding of the predictors of M-payments among rural consumers. The primary data required for conducting this study was collected using a self-administered questionnaire specially designed to achieve the study objectives. A structured questionnaire was drafted to collect the primary data from the rural areas of the state of Punjab through convenience sampling from January to April 2024. First, a pilot study was conducted to identify and refine the items of the various constructs used in the present study. To validate the model's constructs, a multi-item survey instrument in the form of a structured questionnaire was drafted using a five-point Likert scale, where "1" denotes strongly disagree and "5" denotes strongly agree. The language was kept simple so that rural people could accurately understand the questions. In a few instances, the author filled out the questionnaires after consultation with respondents. The measures used in the study were adopted from previous studies and were further tailored as per our study. Three items of Performance Expectancy (PE) were adapted from Pikkarainen et al. (2004), three items of Effort Expectancy (EE) were taken from Davis (1989), three items of Social Influences (SI) were adapted from Venkatesh and Davis (2000), four items of Facilitating Conditions (FC) were developed from Moore and Benbasat (1991), four items of M-payment Awareness (AW) were developed from Sathye (1999), three items of Behavioral Intention (BI) were adapted from Gefen et al. (2003) and four items of Use Behavior (UB) were taken from Wilson (2000).

A pilot study of 213 respondents was done with the aim of recognizing the flaws in the questionnaire, which in turn helped in restructuring and validating the questionnaire. To collect enough data to test the hypothesis, a face-to-face survey was conducted after a pilot study had identified and refined measurement items used for the study. Convenience sampling was used to select approximately 410 customers. After editing all returned questionnaires, 359 questionnaires were found usable for analysis, showing a yield rate of 87.56%. To arrive at certain conclusions regarding the hypothesis advanced in the present investigation, a two-step multivariate technique (i.e. SEM) was applied using the AMOS 21 software package to test the hypotheses and evaluate the association between variables along with accrediting the structural research model. To explore the demographic character of the sampled data, descriptive statistics were applied. The reliability and validity of the construct were confirmed through Cronbach alpha, composite reliability, and convergent reliability by using SPSS.

DEMOGRAPHIC ANALYSIS OF RESPONDENTS

To enhance the evaluative propensity of sampled data and to minimize the effect of biased response, Hair et al. (2010) proposed that the requisite sample size for research purposes should range between 300 to 500. Following these parameters, a total of 410 self-administered questionnaires were dispersed. After editing all returned questionnaires, 359 questionnaires were found utilizable for analysis, showing a yield rate of 87.56%. Table 1 shows the profile of the respondents. The descriptive statistics of the sample reflect more males (84.6%) than females (15.4%). The majority of respondents (71%) fall in the age category of 30 to 35 years. About 47% of the sampled respondents earned between INR 25,000 to 50,000 per month. Of the respondents, 33% hold a bachelor's degree, and 64% are self-employed. On the whole, the sample is skewed toward young, educated, middle-income self-employed males.

Table 1. Respondents profile

Items	Category	No. of Respondents	%
Gender	Male	304	84.6
	Female	55	15.4
Age (in years)	25-29	55	15.4
	30-35	255	71
	36 and above	49	13.6

Items	Category	No. of Respondents	%
Income (per month in INR)	Less than 25,000	102	28.4
	25,001-50,000	169	47
	More than 50,001	88	24.6
Educational qualification	Illiterate	53	14.8
	Undergraduate	92	25.6
	Graduate	119	33
	Postgraduate	95	26.5
Profession	Self-employed	230	64
	Employed	129	36

Results of Factor Analysis and Scale Reliability and Validity

Factor analysis was done through principal component analysis using varimax rotation to understand the extent to which these items are allied to their respective constructs (Kline, 2014). The appropriateness of factor analysis is assessed using two important measures. The first measure is the Kaiser-Meyer-Olkin (KMO) overall measure of sampling adequacy, and its value was 0.893, which falls within the acceptable limit and is significant at $p > 0.001$. The other measure is Bartlett's test of sphericity, and its value was 3236.698, which was significant at $p > 0.001$. This illustrates a highly significant correlation between the constructs undertaken for the study and the appropriateness of conducting factor analysis. A total of seven factors with factor loadings more than 0.05 and eigenvalue greater than 1 were identified and retained for the analysis (Hair et al., 2010). However, these seven factors accounted for approximately 63.66% of the total variance. The reliability and validity analyses were also checked to assess the goodness of measure reliability (Sekaran & Bougie, 2016). Internal reliability was tested by evaluating Cronbach alpha, composite reliability, and average variance extracted (Fornell & Larcker, 1981). Cronbach alpha was within the cut-off limit of 0.60–0.70 (Nunnally & Bernstein, 1994). Composite reliability was above the cut-off limit of 0.70, and all the constructs had average variance extracted at least 0.50, illustrating that all the parameters of internal consistency were appropriately met. The psychometric properties of all constructs, i.e., factor loadings, average variance extracted, composite reliability, and cronbach alpha for this study, are given in Table 2.

Table 2. Psychometric properties of the constructs

Construct	Items	Description	Factor Loadings	Average Variance Extracted	Composite Reliability	Cronbach Alpha
Performance Expectancy	**PE1**	M-payments are easy to understand.	0.906	0.749	0.899	0.921
	PE2	It doesn't require extra effort to learn the usage of M-payments.	0.859			
	PE3	I'm comfortable using M-payments to do my financial transactions.	0.829			
Effort Expectancy	**EE1**	It is easy for me to use M-payments skillfully.	0.847	0.602	0.819	0.735
	EE2	I find that using M-payments is easy.	0.770			
	EE3	It is easy for me to learn how to use M-payments.	0.704			
Social Influences	**SI1**	The people who affect my behavior inspire me to use M-payments.	0.835	0.674	0.861	0.822
	SI2	According to my friends, I should use M-payments.	0.821			
	SI3	According to my family, I should use M-payments.	0.806			

Construct	Items	Description	Factor Loadings	Average Variance Extracted	Composite Reliability	Cronbach Alpha
Facilitating Conditions	**FC1**	I have adequate access to the Internet for using M-payments.	0.824	0.599	0.856	0.852
	FC2	If I face any problem while using M-payments, there will be professionals to help me.	0.783			
	FC3	I have the requisite resources for using M-payments.	0.753			
	FC4	My mobile device is compatible with M-payments.	0.732			
M-payment Awareness	**AW1**	I have adequate information about M-payments.	0.763	0.522	0.813	0.854
	AW2	I have ample information regarding various services offered through M-payments.	0.756			
	AW3	I have the necessary information regarding the usage of M-payments.	0.705			
	AW4	I am well versed in the advantages of using M-payments.	0.661			
Behavioral Intention	**BI1**	Given the opportunity, I will use M-payments.	0.849	0.546	0.777	0.889
	BI2	If I could, I would stop the use of M-payments.	0.802			
	B13	Overall, I believe that M-payments are useful for making payments.	0.524			
Use Behavior	**UB1**	I plan to use M-payments regularly.	0.857	0.610	0.861	0.870
	UB2	I will regularly be using M-payments in the future.	0.812			
	UB3	I have a preference for M-payments.	0.739			
	UB4	I intend to use M-payments in the future.	0.707			
Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy			0.893			
Bartlett's test of sphericity approx. Chi-Square			3236.698			
Df			276			
Sig.			0.000			

Table 3 illustrates that discriminant validity was also within permissible limits, as the square root of the average variance extracted (AVE) was greater than the inter-construct correlations (Fornell & Larcker, 1981). Thus, this depicts that all the constructs are distinct from other constructs, and there is an absence of cross-loadings. Hence, the fitness of the data is indicated for further analysis.

Table 3. Discriminant validity

	CR	AVE	PE	EE	SI	FC	AW
PE	0.930	0.816	**0.903**				
EE	0.791	0.562	0.196	**0.749**			
SI	0.827	0.615	0.186	0.423	**0.784**		
FC	0.861	0.610	0.375	0.303	0.310	**0.781**	
AW	0.860	0.609	0.276	0.117	0.357	0.245	**0.780**

RESEARCH MODEL EVALUATION

The proposed research model was analyzed using Structure Equation Modelling (SEM), which incorporates a two-step evaluation process that includes an assessment of measurement and the structural model (Byrne, 2010). Confirmatory factor analysis was done by studying the covariance structure to test the measurement model, the validity of the items, and the underlying constructs stated under it. The standard values were obtained as follows: CMIN/DF = 1.532, Comparative Fit Index = 0.982, Tucker-Lewis Index = 0.977, Incremental Fit Index = 0.982, Goodness of Fit Index = 0.949 and Root Mean Square Error of Approximation = 0.039. These strongly support the proposed research model given in Figure 1. The instrument demonstrates evidence of both convergent (significant critical ratios, average variance extracted >0.50 on all occasions) and discriminant (AVE/(Corr2) is greater than or equal to unity on all occasions) validity (Fornell & Larcker, 1981). The results confirm that the measurement model portrays a good fit corresponding to the sampled data. In the following step, Structural Model Analysis was done to study the association between the proposed constructs and the significant paths between the constructs. The standard values were obtained as follows: CMIN/DF = 2.413, Comparative Fit Index = 0.924, Tucker-Lewis Index = 0.914, Incremental Fit Index = 0.924, Goodness of Fit Index = 0.873, and Root Mean Square Error of Approximation = 0.063. The analysis of the hypothesized structural model demonstrated an acceptable model fit to data as the overall fit of the structural model was statistically significant and well within the acceptable limit.

HYPOTHESIS TESTING

Figure 2 demonstrates the results of the structural model, which is assessed for hypotheses testing by examining the path coefficients (beta weights). Their results illustrate the strength of the relationship between independent and dependent variables. The path coefficients should be significant and consistent with expectations (Chwelos et al., 2001). The squared multiple correlation (R^2) value shows the amount of variance explained by independent variables. It mirrors the predictive power of the model. In this study, PE, EE, SI, FC, and AW explain 55% (R^2=0.55) of the variance in BI, whereas BI predicts 45% (R^2=0.45) of the variance in UB. This study shows that the proposed model is valid as the value R^2 is not far from 100% (Hernández et al., 2008).

These findings suggest that the constructs and the specified paths account for a significant portion of the variance in endogenous constructs posited. The results of hypotheses testing are given in Table 4. All the predictor variables, i.e., PE (β=0.27), EE (β=0.22), SI (β=0.30), FC (β=0.37), and AW (β=0.44), are positively related to behavioral intention, which is the criterion variable. Similarly, BI (β=0.67) had a persuasive and progressive relationship with UB. The results of hypotheses testing are depicted in Table 3, which illustrates that H1, H2, H3, H4, H5, and H6 are accepted.

Table 4. Hypotheses results and the standardized beta coefficients

Path Coefficient	Beta Coefficient	Estimate	Standard Error	Critical Ratio	P Value	Hypothesis Accepted/Rejected
H1: PE ⟹ BI	0.27	0.212	0.041	5.512	***	**Accepted**
H2: EE ⟹ BI	0.22	0.284	0.057	4.992	***	**Accepted**
H3: SI ⟹ BI	0.30	0.171	0.043	4.018	***	**Accepted**
H4: FC ⟹ BI	0.37	0.329	0.047	7.059	***	**Accepted**
H5: AW ⟹ BI	0.44	0.248	0.039	6.320	***	**Accepted**
H6: BI ⟹ UB	0.67	0.615	0.615	8.673	***	**Accepted**

**** Significant at 0.001 level*

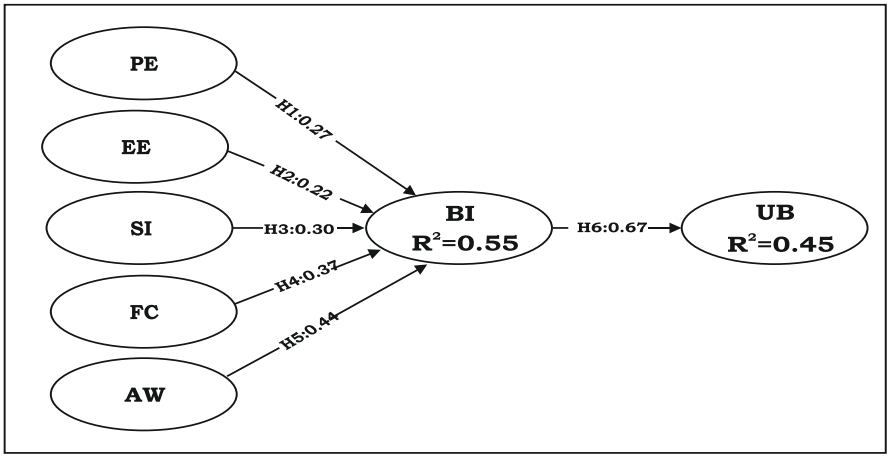

Figure 2. Results of the structural model

DISCUSSION

The empirical findings strongly justify the proposed conceptual framework, which took UTAUT as its foundation and further extended it by incorporating the M-payments awareness construct to make it more comprehensive. The results clearly validate both the theoretical and empirical soundness of the research model to unearth the enablers and inhibitors by providing a fresh perspective toward M-payments in rural areas. The SEM results illustrate the ability of all the constructs of the extended UTAUT model to explain the BI of customers to adopt M-payments. By including AW along with the existing UTAUT constructs, the model explains 55 % of the variance in BI, and BI predicts a 45% variance in UB for M-payments. The study has found that AW (β=0.44) is the strongest determinant within the proposed model for deeper diffusion of M-payments in rural areas. Our results are found to be in sync with the results of earlier studies (Balachandran & Tan, 2015).

The study also confirms that FC (β=0.37) plays a pivotal role in behavior intentions to use M-payment services. It is indeed true that for the rural masses to embrace M-payments, it is important to have the requisite technical infrastructure and resources that could result in ease of using M-payments. The results of this study also offer solid proof, which affirms that Indian rural areas are close-knit communities that are just like an extended family where social influences play an integral role (Ray et al., 2019). Reference groups, friends, and colleagues play a major role in decision-making. Rural people are easily swayed by the verdict of their social group to embrace and accept M-payments (Pal et al., 2020). Being the most credible source, social influencers advocate the advantages of using M-payments, help mitigate the risk, drive the requisite trust, and harness faith in using M-payments (Park et al., 2019).

The analysis threw light on another important dimension, i.e., PE, as a necessary precondition for the smooth adoption of M-payments in rural settings. Rural people often are inclined to readily adopt payments only if they are perceived to be easy to use and will provide them with concrete benefits. On the contrary, they will shun them if they are troublesome and are not helping individuals to improve their performance in making payments. Banks need to work on optimizing customers' perceptions to build faith in M-payments (K. P. Gupta et al., 2019). Last but not least, a factor promoting M-payments is EE in the physical and mental shape on the part of the knowledge holder to externalize the concept of fostering M-payments. Users should be free from all the cognitive efforts and numerous phases linked with the payment procedure, which may be a daunting task for potential adopters (Touray et al., 2015). Thus, it is perceived that M-payments would be showing an ascending trajectory, propelled by smartphone and feature phones incursion, robust regulatory framework, payments interoperability systems along with thrust from government and financial institutions for the proliferation of thriving and innovative cashless ecosystem in rural hinterlands of India.

CONCLUSIONS

The study concludes that the UTAUT model was both theoretically and statistically valid, demonstrating a significant impact on the adoption of m-payments in rural India. The SEM analysis revealed that performance expectancy, effort expectancy, m-payment awareness, social influence, and facilitating conditions collectively explained 55% of the variance in rural users' intention to adopt m-payments ($R^2 = 0.55$).

IMPLICATIONS OF THE STUDY

The government needs to play a pivotal role in advocating the benefits of using M-payments, promoting transparency and accountability of the intermediaries, and reducing transaction costs. They should also plan literacy campaigns for digital financial inclusion to channel the income into savings and expand their outreach of M-payments (Chatterjee & Das, 2021). Financial institutions need to endorse the concept of M-payments as a haven for financial payments. This would help build trust among the masses and mitigate the insecurities linked to M-payments (Wiese & Humbani, 2020). Moreover, policy interventions need to be directed towards expediting the grievance mechanism for quick remedial actions. A feedback mechanism will immensely help in knowing the dark areas and help payment service providers work diligently to provide a seamless payment experience to the rural masses. With the help of NGOs and self-help groups, more awareness campaigns should be launched by integrating various marketing communication channels like advertisements, social media, etc., so that a substantial portion of the rural population understands and adopts the digital mode of M-payments. Moreover, it is recommended to strategically use social media platforms such as Facebook, YouTube, and others to show videos for spreading awareness about multifaceted benefits linked with M-payments, as most mobile users spend reasonably good time on such platforms (Slade et al., 2015).

The large population in rural areas is less educated, so in line with this assumption, NGOs, together with bank officials, should organize training, awareness, and educational campaigns to sensitize and promote the ease of usage of M-payments amongst rural masses and necessary facilities to make M-payments with ease (Murendo et al., 2018). Moreover, even mobile manufacturing companies ought to come up with devices that are easy to use and incorporate multilanguage mobile applications especially for rural areas, as India is a multilingual country. Augmenting the infrastructure in the form of reliable technology, adequate agent networks, and speed internet network coverage are some of the verticals where M-payment service providers need to invest to provide impetus for the adoption of M-payments (Chen & Chang, 2013). Nevertheless, if all these things are in place, M-payments would grow in leaps and bounds, far beyond the limits of their immediate terrestrial boundaries. Moreover, there should be strong technical support services like helpdesks, hotlines, and customer support wings where users can turn up in case of any grievances related to the usage of M-payments. This research also affirms the results of prior studies (Venkatesh et al., 2016), which state that FC helps operationalize M-payment behavioral intention and use behavior.

Furthermore, the effect of social influencers on behavioral intentions is often stronger for novice users who have never used M-payments, as they are more likely to rely on others' reactions to form their intentions (Kalinic et al., 2019). Due to deep-rooted social embeddedness in rural setups, campaigns like 'tell-a-friend' or 'refer-a-friend' could greatly help in gaining market share (Wiese & Humbani, 2020). Moreover, policymakers need to be cognizant of the importance of these entities while framing M-payment policies (Teng et al., 2018). Even marketers ought to constantly be in touch with customers who are already using M-payments to win their loyalty in the long run. They should consider them as the catalysts whose positive word-of-mouth would encourage others to adopt M-payments in rural settings. Social interaction hubs in rural areas need to be carefully figured out as these locations are appropriate for explaining the advantages and usage procedures and for promoting M-payments in the context of rural areas in developing counties (Sarkar et al., 2018).

Embracing M-payments will help rural consumers reduce transactional costs and time manifolds, along with unleashing the inconvenience of carrying physical currency. Moreover, the adoption rate will increase exponentially if people think that using M-payments is free from physical, emotional, and psychological efforts (Chopdar & Sivakumar, 2019). Customers will use M-payments voluntarily and efficiently if they have a high level of awareness coupled with knowledge about the ease of using them (Sharma & Chopra, 2018). Service providers should leave no stone unturned to create a positive user experience for users that would help attract potential users (Humbani & Wiese, 2018), resulting in economic growth for the masses.

However, rural people who are stamped as underbanked or unbanked strata of society, if made accustomed and compatible with M-payments, would make it part of their lifestyle and social image. It would be prudent for service providers to design the interface of M-payments in such a way that it results in the least mental effort, along with encouraging customers who are less techno-savvy to adopt M-payments (K. P. Gupta et al., 2019). Residents in rural areas are usually late adopters. This may be because they are less tech-savvy and have lower self-efficacy than their urban counterparts. Therefore, banks must distribute leaflets and manuals to propagate the usefulness of M-payments (S. Gupta et al., 2017), which would provide much-needed momentum for transforming the Indian digital landscape.

Limitations and Future Research Direction

Although this research endeavored to investigate extensively the core traits of usage behavior and behavioral intentions of rural flocks towards M-payments, there may still be a possibility of missing key microscopic dimensions, such as trust and risk associated with M-payments. The generality of the findings of the current study should be considered carefully, as the response has been solicited only from the people living in rural areas of Punjab. Thus, people's opinions may vary considerably compared to that of the rest of India. Due to the differences in mobile technology adoption and usage across countries, conducting cross-country analyses is necessary to determine adoption levels and perceptions. This will help national and multinational corporations, governments, and regulators better understand the characteristics of successful and unsuccessful m-payment initiatives. Also, the adapted model can be further tested with moderating factors like age, gender, and education to gain a deeper understanding of the complexities of M-payments, especially in rural areas of India. Moreover, in the future, cross-sectional studies could be done to evaluate the behavior intentions of different sections of society. Moreover, future studies may examine the importance of risk factors, particularly loss of privacy data and personal information, in the adoption of M-payments.

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