Exploring Influencing Factors for M-payment Apps Uses in the Indian Context

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Abstract

Purpose This paper aims to understand the effect of enjoyment (ENJ), facilitating condition (FC), mobility (MOB), collaboration and trust in developing a positive attitude for Indian customers to use m-payment apps. *Methodology* The study proposed a new paradigm on the grounds of extended technology acceptance model (TAM). By using structural equation modeling (SEM), the frameworks were empirically examined on responses from 328 respondents. *Findings*—The empirical results indicate that five factors—collaboration, enjoyment, facilitating condition, mobility and trust, positively affect the consumer's attitude for using m-payment services. However, it has been found that the collaboration and trust construct have no direct impact on the attitude to use m-payment apps. *Research limitations/implications*—The study highlights the significance of these other variables that are critical when it comes to using m-payment apps to identify buyer behaviour. The study will, therefore, guide for all m-payment service providers to develop their services accordingly.

Keywords

M-payment apps • Enjoyment • Facilitating condition • Collaboration and trust

1 Introduction

In recent decades, financial service firms have transformed. For the Indian payment market, 2018 was a formative year. Mobile payments have shown their unparalleled ability to alter our way of dealing. As a result of this convergence and growing technical developments, the international payment environment is changing rapidly (KPMG, 2019). Mobile apps allow consumers throughout their lives, from knowledge searches to purchases (Taylor & Levin, 2014). Consumers mean mobile users, who download apps and use them to scan, purchasing, networking, banking, and streaming video for details. All customers and the industry face a new technological surge. The 2021 vision for payment and settlement systems in India strengthens the strong basis established during the past two decades. Although the search for a 'cashless' society goes on, followed by the desire to include India with a cheaper card, efforts are also being made to ensure increased efficiency, continuous availability of protected, safe, reliable and affordable payment systems, as well as to serve sections of the community that are not affected by payment systems until today (RBI, 2019). By 2025, digital transactions may amount to United States Dollar 1 trillion yearly in India, with 4 out of 5 digitally-based transactions. India is currently nearly 90 million digital transactions. However, it will have been able to triple to 300 million by 2020 when new users come into the market from rural and half-urban regions. (ET, 2018).

The rise in India's mobile payments has been driven by highly competitive countryside and foreign investment. India has many payment providers, with more than 45 wallet apps, 50 payment providers based on UPIs and 142 banks on the UPI network, compared to China and Japan. The business landscape stretches from telephone providers, banks, to online firms, and messaging service provider. (KPMG, 2019) The researchers need special attention to be paid to this fast-developing user of humble Indian mobile applications. The factors influencing the purpose of adopting

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payment are, therefore, to be discussed (Dahlberg et al., 2008). The implementation of m-payments is of particular significance to managers and researchers, as it can be a significant advantage for business enterprises, payment processing providers, software service providers and third parties (Lim, 2008; Ondrus & Pigneur, 2006). In India, no researchers have considered the effect of constructs, namely collaboration, enjoyment, facilitation condition, trust and mobility on attitude, to use the m-payment apps. Therefore, the study aims to explore variables that influence the attitude of using the m-payment apps.

2 Literature Review

2.1 Collaboration (COLL)

After experiencing various research and literature, we have recognised a significant component of m-payment, i.e., collaboration. In the Indian context, this construct is not used in a study for m-payment. Collaboration alludes to the relationship of a specific m-payment company with some other specialist organisation for the business. For instance, Amazon pay (an m-payment app) in India has a tie-up with Pharm Easy (Online Medicine supplier), wherein, "when you pay through Amazon pay, at the same time, purchase of medicine, the client is incited with a message that he will get additional cashback up to Rs. 300 on Amazon Pay + Get 18% off on first medication request."

Also, numerous partners have tied up with various m-payment service providers and receive instant cashback by using those particular m-payment apps. The user gets the money back immediately by using the coupons displayed at the transaction point. Collaboration, as a construct, was adopted through various interviews and study done by Kapoor and Vij (2018) on food ordering apps. Therefore, the following hypotheses have been propounded based on the above-mentioned study.

H1: Collaboration has a favourable influence on the perceived ease of use of m-payment applications to establish an attitude to use.

2.2 Enjoyment (ENJ)

Enjoyment (Davis et al. 1992) is characterised as "The level over which computer work is considered on its own to be friendly, except any anticipated performance consequences." In our research, the concept of how much m-payment is considered to be enjoyable by a consumer can be interpreted. (Venkatesh 2000), who researched PEOU's effect on user acceptance, His study model gained insight and noticed a strong relationship between customers through improved capabilities for ENJ and PEOU. Following the current literature and the role of ENJ in approving m-payment study, the following hypotheses have been formulated:

H2: Enjoyment has a significant influence on the perceived ease of use of m-payment applications to establish an attitude to use.

2.3 Facilitating Conditions (FC)

Facilitating conditions are described as the level whereby a person feels that the technological and organisational infrastructure assists the programme "(San Martín & Herrero, 2012). Such circumstances may illustrate variables that influence the chances of a person using a programme (Maruping et al., 2016; Venkatesh et al., 2003). Facilitating conditions can minimise ambiguity or misunderstanding in applications (Al-Gahtani et al., 2007). The following hypothesis is suggested to validate this relationship within the context of m-payment applications:

H3: Facilitating conditions have a favourable influence on perceived ease of use m-payment applications.

2.4 Mobility (MOB)

Mobility includes three aspects in literature: comfort, timeliness and imminence (Seppala & Alamaki, 2003). This allows users to access resources or information on mobile platforms at any and all times by mobility. As a consequence, the m-payment app can help users manage their financial assets efficiently. Earlier studies have revealed that consumers regard mobile services as the prime reward of performance and quality and that these advantages are the product of mobility (Hill & Roldan, 2005). A new direction of providing access to financial services via mobile devices is supplied by m-payment app, thus enabling a unique aspect of bank and customer interaction. Therefore, due to their mobility, m-payments are valuable. Therefore, as a precedent for the attitude to use the m-payment app. We have incorporated mobility into the original TAM. The following assumptions were made:

H4: Mobility is favourably correlated with the perceived usefulness of the m-payment app.

2.5 Perceived Ease of Use (PEOU)

Perceived ease of use can be described as' the extent of effort-free use by a person "(Davis, 1989). Effort refers to the limited resources for which an individual is responsible. So many research studies have found a positive influence of

PEOU on PU at a substantial level in different domains, like mobile businesses (Wu & Wang, 2005), online commerce and banking. Based on these results, we assumed that all the relationships of TAM hypothesised are also crucial for the m-payment app. The following hypotheses have been formulated:

H5: Perceived ease of use is linked positively to perceived usefulness of the attitude to use the m-payment app.

2.6 Perceived Usefulness (PU)

In m-payment, the system is beneficial for quick transactions, such as payment services for utilities, bills, online buying and ticket bookings. Perceived usefulness (PU) defines Davis (1989) as "A person thinks that using a platform would increase their work performance." Consumers objectively assess all the advantages they get when they are using any novel product before using it. Mobile technology literature also provides empirical evidence of consumers' ability to use digital technology (Mallat, 2007; Ondrus & Pigneur, 2006). If consumers find the program useful for transaction needs or financial issues, they can use m-payment systems. We also assume that using m-payment for positive results is advantageous. The following assumptions have been made:

H6: Perceived usefulness is linked positively to the attitude to use the m-payment app.

2.7 Trust (TR)

Trust can be interpreted as a significant consumer expectation of service providers (Mayer et al., 1995). According to these concepts, customer convictions on the protection of online shopping are focused on trust. Honesty, skill and benevolence are the three convictions of trust (Palvia, 2009). Trust is the strongest driver of customer trust in electronic services (Mallat, 2007; Yan et al., 2009). With regard to the use of mobile payment systems, individual and financial details from customers, trust is an effective way of using m-payment (Duane et al., 2014; Kim et al. 2010). The following assumptions have been made:

H7: Trust is significantly related to the perceived usefulness of the m-payment application.

2.8 M-payment Attitude to Use (MPAU)

In emerging economies, demand in m-payments is the result of rapid technological, regulatory and environmental changes. In light of TAM with certain advanced factors, Pousttchi and Wiedemann (2007) performed a study of the adoption of m-payment in Germany. They claimed that PU and PEOU had a big influence on the behaviour toward m-payment. Due to the rising importance of mobile trade and associated m-payment, different device characteristics are required, and their personal effects can be evaluated on both the perceived usefulness of m-payment and its perceived ease of use. So, based on the above literature, the following hypotheses have been formulated:

H8: The perceived ease of use is positively related to the attitude towards using the m-payment app.

3 Research Methodology

3.1 Measuring Constructs

As part of this research, a survey instrument was established based on analysis of literature relating to m-payment and another attitude-related literature on adoption. For collecting the response, a five-point Likert scale (anchored to strongly disagree = 1 to strongly agree = 5) was used. The researcher has identified a definitive collection of 27 items, out of 29 items and used them for the final creation of the questionnaire. So the questionnaire is made up of two parts. First, the demographic characteristics of the respondent and the second part contain the questions of dependent and independent constructs.

3.2 Data Collection Process

Our study used a survey of m-payment users to collect data to test hypotheses and discuss research goals. An online survey was performed by sending the questionnaire to graduates, staff, business people and other citizens of the society in February through mid-March 2020, assuming they are m-payment app customers. All the respondents are from major cities, ideally from India's Lucknow and other East UP cities. We approached 483 respondents, and finally, we managed to obtain a total of 328 responses from questionnaires with a response rate of 67.9%.

Among respondents, 64% are male, and 36% are female. Our 41% of respondents are less to age 24 years, 33% having between the age group of 24–30 yrs, 17% are in the age between 30 – 43 years. 45% respondents are graduates, and 49% are postgraduate, 32 and 53% are students and employees. Maximum 40% of respondents use m-payment apps either once in a day or week each, and 20% use the app in a month. 36% of respondents are using m-payment apps for less than 1 year, 45% from 2 years, 20% for 3 years and 1% for more than 3 years. (Table 1).

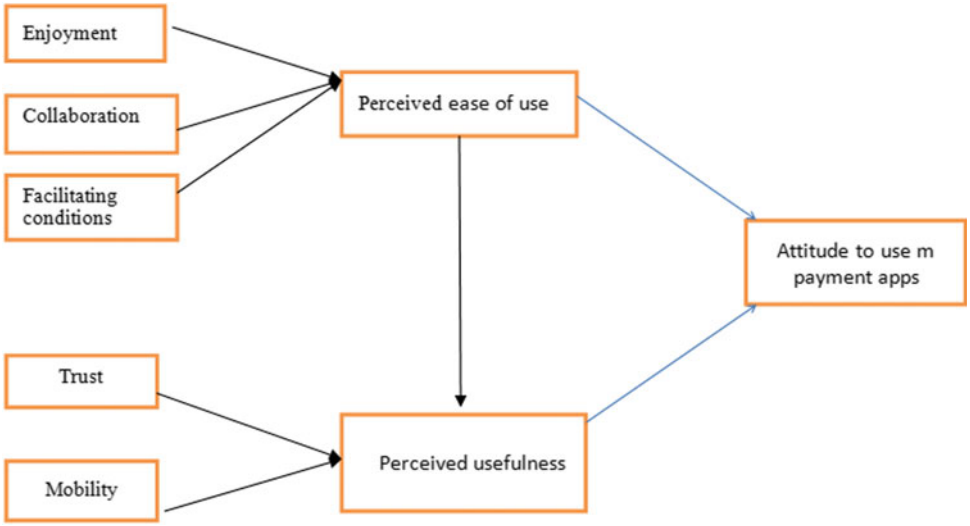

Fig. 1 Proposed research framework

Table 1 Detailed demographic profile of respondents

Variable	Levels	Count	Percentage
Gender	Male	210	64
	Female	118	36
Age	Less than 24 years	135	41
	25–30 years	108	33
	31–36 years	55	17
	37–43 years	55	17
	Above to 43 years	4	1
Education	Intermediate	13	4
	Graduation	149	45
	Post-graduation	161	49
	Other	5	1
Occupation	Student	106	32
	Employee	174	53
	Entrepreneur	41	13
	Other	7	2
M-payment apps frequency	At least once in a day	131	40
	At least once in a week	134	40
	At least once in a month	63	20
Usage of m-payment apps	Less than one year	116	36
	1–2 year	147	45
	2–3 year	65	20
	>3 year	4	1

4 Data Analysis and Result

The researcher used SmartPLS 3.0 statistical software for data analysis and processing of the structural model analysis (Bagozzi and Yi, 1988, 2012; Hair et al., 1998; Davison et al., 2003) through the partial least square method. The researcher found the PLS-SEM method to be suitable (Hair et al., 2013) since it is considered ideal for both parametric and nonparametric data. This is useful for determining the causal relationship between independent constructs and dependent ones.

4.1 Validity and Reliability

The study of reliability and validity was carried out to ensure the accuracy of the proposed structures. To calculate the reliability of the research objects, we checked the composite reliability values and Cronbach's alpha (Raykov, 1997). In both cases, we found the minimum standard of 0.70 to be higher or equal (Nunnally, 1978). The results of the study show that values for Cronbach's alpha are almost 0.70–0.86. The value for composite reliability is between 0.72 and 0.85 (Table 2).

Likewise, for the calculation of construct validity, the researcher observes internal consistency values (Fornell & Larcker, 1981) utilising loading factors and AVE values that should be higher than 0.50 and in our analysis, every constructs AVE values of greater to 0.6. (Bagozzi & Edward, 1998).

Table 2 Reliability and validity analysis

Constructs and their observable items	Loadings
Perceived ease of use (PEOU) (AVE = 0.64, CR = 0.85, α = 0.85) (Davis (1989)	
PEOU 1: I think the process would be quick and simple if I use m-payment	0.86
PEOU 2: I think it is easy for me to be professional with m-payment	0.796
PEOU 3: I think it is easy to use m-payment	0.839
Perceived usefulness (PU)(AVE = 0.67, CR = 0.86, α = 0.86) (Davis, 1989; Kim et al., 2010)	
PU 1: With m-payment, I would be able to pay quicker	0.801
PU 2: It is simpler for me to make transactions with m-payment	0.832
PU 3: It would be helpful to use M-payment	0.831
Collaboration (COLL) AVE = 0.61, CR = 0.86, α = 0.86) (adapted from Kapoor & Vij, 2018)	
Coll 1: Using the mobile app gives me cash back choices	0.8
Coll 2: The m-payment app has links to other players in e-commerce	0.776
Coll 3: Every time I get incentive while placing an order through the m-payment app	0.821
Coll 4: The mobile app gives me coupons that can be used at a step later	0.729
Enjoyment (ENJ) AVE = 0.66, CR = 0.87, α = 0.88) (adapted from Cyr et al., 2006; Davis, 1989; Shih, 2004)	
ENJ 1: Using m-payment would be a new exciting experience	0.877
ENJ 2: Using m-payment for online payments would be a speedy process	0.81
ENJ 3: M-payment process involves only a few steps for payments	0.797
ENJ 4:Using m-payment make me feel happy	0.834
Trust (TR) AVE = 0.61, CR = 0.82, α = 0.82) (adapted from Shankar and Datta, 2018)	
TRUST 1 I think legal frameworks for providing m-payments are sufficient Strong enough to defend customers	0.803
TRUST 2 I think m-payment service provider has appropriate skills and Resources to deliver those services	0.759
TRUST 3 I think m-payment service provider can behave ethically when my data is collected, retained, processed and managed	0.78
Facilitating conditions (FC) AVE = 0.66, CR = 0.85, α = 0.85) (adapted from Riffai et al., 2012; Sun et al., 2013)	
FC 1 I possess all the requirements for operating m-payment	0.823
FC 2 I would obtain enough information for operating m-payment	0.839
FC 3 M-payment would be suitable for my online transactions	0.782
Mobility (MOB) AVE = 0.64, CR = 0.85, α = 0.85) (adapted from Huang et al. 2007)	
MO 1 M-payment can be easily accessed every time, anywhere	0.829
MO 2 Mobility allows real-time data to be obtained	0.794
MO 3 Mobility is an excellent benefit of m-payment	0.822
M-payment Attitude to use (MPAU) AVE = 0.58, CR = 0.85, α = 0.84) (Kim et al., 2010)	
MPAU 1 Currently, I pay with a cell phone for the transactions	0.7
MPAU 2 I intend to use the m-payment, assuming I have access	0.81
MPAU 3 I will be paying for shopping with a mobile phone in the next six months	0.809
MPAU 4 I plan to pay for purchases by using mobile phones for the next five years from now	0.769

4.2 Discriminant Validity and Multicollinearity

Consequently, the extracted factor values and mean–variance (AVE) exceed the minimum standard of 0.50. The research analysis also describes the findings for the discriminant validity of heterotrait-monotrait (HTMT) (Henseler et al., 2015), which reflect the degree of uniqueness of one construct with other constructs, based on the low correlation between the constructs. As all HTMT values are lower than 0.90, which satisfies the requirements of HTMT (<0.9) suggested by Kline (2015) for all study constructs, it is assumed that the measurement model is adequately accurate, discriminating and convergent (Tables 3 and 4).

4.3 Multicollinearity Assessment

The values of HTMT should be below 0.9 (which is in our study, Table 3), and Fornell and Larcker values should between 0 and 1 (our study value exists between 0 and 1, Table 4). There is also no multicollinearity between the independent variables. (Grewal et al., 2004; Hair et al., 2011).

4.4 Hypothesis Test and Path Coefficients

To verify the formulated hypotheses based on scientific significance values of factor loading and path coefficients, the researcher applied a nonparametric bootstrap method on the SmartPLS 3.0 programme (Chin, 2001; Davison et al., 2003). Table 5 demonstrates the importance for all relationships of standardised path coefficients (β), t-value and related significance levels.

5 Discussion

The suggested model was assessed in this study using partial least square structural equation modeling (PLS-SEM). R^2 value for attitude to use m-payment apps is 0.61, which allocates 61% variance of a customer to use m-payment apps, 55% variance to PEOU and 54% variance to PU which are considered to be a good model (Hair et al., 2011), and all R^2 are statistically significant. Model fit was checked by evaluating SRMR, where the approximate average for the saturated model is 0.041 and 0.061, which is less than the acceptable value of 0.1 (Hu & Beutter, 1998). Therefore, the model being proposed is good to go forward.

Bootstrapping was performed with 5000 subsamples, proposed in 2011 by Hair et al. All hypotheses were tested statistically significant except for collaboration to PEOU and trust to perceived use. As already mentioned, this study was conducted primarily to access the crucial factors and their effect on Indian customers to use m-payment app.

H1: The statistically relevant hypothesis was not confirmed. In this analysis, there is no correlation between PEOU and collaboration. This tells Indian consumers that the app was not easy to use and still earn cashback, rewards and discounts by using the m-payment app. The collaboration was described in the previous study by Kapoor et al. (2018) as an essential factor in the ease of use in India by online aggregators.

H2: Hypothesis guarantees that it is easy to use, enjoyable and pleasant for clients who enjoy using the payment app. In the earlier research of Al-Hawari and Mouakket (2010), it was concluded that enjoyment has no significant impact on e-satisfaction among students contrary to our research. Enjoyment has a positive influence on m-payment attitude as well as PEOU, which is consistent with the study findings.

H3: Facilitating conditions have a favourable influence on both attitudes to m-payment and PEOU, endorsing with previous literature of Venkatesh et al. (2012) as the stimulating effect of facilitating conditions on the acceptance and adoption of technical innovations by users. Facilitating conditions in the sense of mobile apps include all details for downloading and configuring the application and its efficiency.

H4: Hypothesis is statistically significant, which is consistent with a Kim et al. (2010) past study where mobility has a positive impact on PU for m-payment applications. Hypothesis verifies that the m-payment software can be conveniently used by customers anywhere, at any time.

H5: The relationships PEOU and PU are supported on the basis of the hypothesis test. In a previous study of Driedigera and Bhatiasvib (2019), positive ties between PEOU and PU are confirmed by research, which means customers who find m-payment apps easy to use, or who believe they can quickly become good at using it, are likely to view it as beneficial.

H6: Hypothesis notes that the PU would positively affect the attitude towards using the m-payment app in Kim et al. (2010) previous research, where transaction speed and simple usability have a critical impact on PU for m-payment devices.

H7: The hypothesis has not provided statistically significant support. There is no correlation between trust and PU for this study, which runs counter to the result of many (Duane et al.

Table 3 Discriminant validity—HTMT criterion

	ATT TO USE	COLL	EJ	FC	MOB	PEOU	PU	TR
ATT TO USE								
COLL	0.891							
ENJ	0.826	0.743						
FC	0.89	0.801	0.752					
MOB	0.833	0.767	0.699	0.78				
PEOU	0.872	0.758	0.814	0.808	0.741			
PU	0.867	0.76	0.791	0.777	0.767	0.849		
TR	0.841	0.752	0.704	0.848	0.713	0.763	0.745	

Table 4 Fornell–Larcker criterion

	ATT	COLL	EJ	FC	MOB	PEOU	PU	
ATT	0.767							
COLL	0.936	0.782						
ENJ	0.826	0.741	0.815					
FC	0.886	0.802	0.751	0.815				
MOB	0.83	0.764	0.699	0.778	0.815			
PEOU	0.871	0.758	0.813	0.808	0.739	0.832		
PU	0.866	0.759	0.792	0.776	0.767	0.848	0.821	
TR	0.838	0.753	0.704	0.846	0.713	0.763	0.745	0.781

Table 5 Main effects and path coefficients

Hypothesis	Beta	*t*-value	*p*-value	f^2	Result
H1: COLL -> PEOU	0.141	1.249	0.212	0.025	**Not supported**
H2: ENJ -> PEOU	0.429	4.313	0	0.289	Supported
H3: FC -> PEOU	0.373	3.1	0.002	0.172	Supported
H4: MOB -> PU	0.263	2.938	0.003	0.12	Supported
H5: PEOU -> PU	0.548	5.04	0	0.443	Supported
H6: PU -> ATT	0.453	4.268	0	0.314	Supported
H7: TR -> PU	0.139	1.628	0.104	0.031	**Not supported**
H8: PEOU -> ATT	0.487	4.368	0	0.362	Supported

Note Significance level $P < 0.05$, if *t*-value $\geq$ 1.96, based on two-tailed *t*-test

2014; Yan et al. 2009; Zhou 2011) m-payment adoption studies.

H8: The finding is statistically significant, which means that PEOU is the determinant of India's decision to accept m-payments. The major impact of PEOU on m-payment is similar to previous results from studies conducted on m-payment (Apanasevic et al., 2016; Chen, 2008; Kim et al., 2010; Zhou, 2011).

6 Conclusion

As a separate financial transaction method, m-payment is taken into account by consumers worldwide. There is no study available in India to examine the plan to accept payments. To resolve this disparity, a complete model has been built to explore variables impacting India's intention to implement m-payments. These results show that the attitudes to use m-payment apps are significantly influenced by PEOU, PU, fun, ease of use and mobility.

The study examined the factors affecting the intention of Indians to accept payment. In the Covid-19 pandemic, individuals are using m-payment applications more (Singh et al., 2020). The findings indicate that enjoyment, facilitating condition and mobility have a considerable effect on adoption. However, the impact of collaboration and trust on adoption intentions is not essential. Results also show that PEOU is influenced by the enjoyment and facilitation condition. Results show that PU is greatly influenced by mobility. The findings also show that PEOU and PU are primary factors influencing the intention to accept payment.

Such results provide the provider with guidance to consider the expectations of consumers.

While very few studies in countries like India have been carried out on the adoption of the payment application, the extended TAM for the payment app has already been explained and validated. In their payment app, India and other Asian neighbours, the emergence of tremendous potential in helping understand developing countries' business actions.

Finally, to keep consumers happy and engaged, companies should involve with lucrative deals. We hope that m-payment apps service providers will integrate all of the above considerations into their thoughts and practice.

7 Limitations and Further Research

There are some restrictions in the current analysis. First of all, our respondents constitute a tiny Indian community, so future studies should look at how various lifestyles and demographics affect m-wallet services recommendations. There may be different results from a broad and various study. Besides, future research could include the efficacy and impact, for both developing and developed countries, of online pharmacy app with the user acceptance and recommendations of technology. Visual design, the attractiveness of the website, that potential researchers should recognise.

8 Research Implications

Many banks in India introduced and released their wallet to enter the market. Established m-payment services providers also implement creative offerings for new customers. As India is a developing m-payment market, this analysis offers a better interpretation of user-centred variables impacting the purpose of adopting m-payment. The research examined the relationship among five attributes for encouraging customers to use the m-payment app service. We have attempted, through extended TAM, to address elements that influence the purpose to adopt m-payment. With an executive point of view, the research findings have many repercussions for developing the m-payment system to improve the rate of adoption in India. There is a positive association between enjoyment and m-payment adoption, which means if a customer finds m-payment fun, they quickly adopt m-payment services. Both PEOU and PU significantly affect m-payment adoption. Providers must build specific creative techniques to persuade customers that this new method is more useful than conventional payment systems.

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