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Analysing Antecedents of E-payment Adoption by Consumers: Evidence from India

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Abstract
Over the past decade, India has seen a considerable rise in the usage of e-payment systems due to changes in consumer behavior, government efforts, and technical improvements. The study aims to identify the key antecedents of e-payment adoption in India. A UTAUT model with perceived trust was employed in the study. An online survey in NCR was used to gather the data through a snowball sampling technique. 257 responses were recorded. PLS-SEM was employed to analyse the data. The findings demonstrate that facilitating conditions is the strongest motivator to adopt the e-payment system in India, followed by performance expectancy and effort expectancy. Whereas social influence and perceived risk exhibited an insignificant impact.

Keywords—E-payment, behavior intention, UTAUT, PLS-SEM, India

INTRODUCTION
India's financial transactional system has completely changed with the coming of digital payment methods. The country is fastly moving towards a digital future which is famous for its diverse and rich cultural past. Due to many initiatives by the Indian government to promote digital transactions and the increased use of smartphones, India has seen a notable transformation in the payment system [1]. Other digital payment options that are more practical and safe are progressively taking the place of conventional payment options like cash and cheques. This change has given millions of previously marginalised people access to banking services and expanded their financial inclusion. The emergence of digital payments has not only revolutionised cashless transactions but has also significantly influenced India's financial autonomy path [2].
Everything is now digital, including payments, purchasing, and manufacturing. The availability of online banking and other mobile applications have made it easier for customers to perform transactions anytime and anywhere because of the growth of the Internet [3]. The Indian government launched the "Digital India" program to raise the comprehension, accessibility, and utilisation of digital technology [4]. Along with state and federal governments, the Digital India program has built a foundation for citizens to experience a knowledge-based, technological revolution in governance. This program is centred around three main areas: a) infrastructure as a public utility b) Citizen Digital empowerment, and c) governance and services on demand [3].
The term "Cashless Economy" has gained popularity recently and is something that many economies want to achieve [2]. It is regarded as the greatest model of the modern economy by eminent economists. A cashless economy makes use of digital or plastic money, such as debit and credit cards, e-wallets, and electronic financial transfers via systems like the Unified Payments Interface and the Aadhar-based payment system. According to the report of Statista Research Department, 975 debit

and 101 credit cards were in use as of May 2024 suggesting a preference for contactless transactions [5].

By linking the bank accounts of individuals to their pay cheques and encouraging the establishment of bank accounts linked to Aadhaar accounts as part of the Jan Dhan plan, the Indian government has continued to promote financial inclusion. All industries, including businesses, government agencies, the agricultural sector, and private groups, must adopt cashless transactions to reduce operating expenses like currency production and supply prices [6].

Electronic payments, sometimes referred to as e-payments, are a general term for any kind of electronic money transfer between organisations and individuals. It encompasses a broad range of digital payments, such as those made using a web-based payment gateway, bank transfer, credit card, debit card, or mobile wallet [7]. Financial transactions, bill payments, and money transfers are just a few of the many uses for electronic payments. E-payment has become an essential part of everyday life. Despite all the efforts by the government for bringing financial inclusion in the country its adoption rate is still low. Therefore, it is necessary to comprehend the present state of e-payment acceptance in India. Thus, the study have the subsequent objectives:

A. To identify the key antecedents of E-payment adoption in India.
B. To analyse the most significant determinant of E-payment adoption in India.

THEORETICAL BACKGROUND AND FORMULATION OF HYPOTHESIS

Numerous research have been done on the variables that affect a user's decision to use new technology, and several behavioral models have previously been produced [8,9,10]. Considering this context, the most often used models are the unified theory of acceptance and use of technology (UTAUT) and the technology acceptance model (TAM). Concerning this study, a UTAUT model and one external variable, Perceived trust, has been adopted to analyse the users' behavior intention (BI) to adopt e-payment system in India. A UTAUT model was developed by [11] and includes four elements: performance expectancy (PFE), effort expectancy (EFE), social influence (SCI), and facilitating conditions (FTC). These four elements strongly connect to user acceptance and usage behavior of electronic payment systems. Previous research has examined and implemented the UTAUT model [12,13,10,8]. The UTAUT model is unquestionably very successful in analysing how the technology is embraced in literature, especially when it comes to identifying the antecedents that determine both the intention to utilize the technology and its actual usage [11,14].

A. PFE

PFE is described as the benefits or advantages of using an innovative technology [14]. According to earlier studies on mobile payments, one crucial element influencing technology adoption is the user's expectations regarding the performance of a certain innovation [15,16]. Thus, the study proposed:

H1: PFE significantly affects the users' behavior intention to adopt e-payment.

B. EFE

EFE is the convenience associated with using a particular technology [14]. It has been highlighted by researchers that EFE influences the intention to accept technology [17,18]. This leads to the following:

H2: EFE significantly affects the users' behavior intention to adopt e-payment.

C. SCI

SCI refers to the users' perception of how other people in society feel about the usage or adoption of a particular technology [14]. Being a member of the social environment, a person cannot deny how society influences his life and decisions. Prior research has demonstrated that SI precedes the decision to utilise innovation [10,12]. Hence, the study proposed:

H3: SCI significantly affects the users' behavior intention to adopt e-payment.

D. FTC

FTC is expounded as the level to which a person expects that technological and organizational infrastructure is present to make a system easier to utilize [14]. The FTC encompasses several factors, including the level of awareness that the company imparts regarding technology use while advertising it to clients or the degree of alignment between traditional and innovative approaches that either causes or prevents issues during use. Previously several studies have shown an association between FTC and BI to adopt a new technology [12,19]. Thus, we proposed:

H4: FTC significantly affects the users' behavior intention to adopt e-payment.

E. PRT

PRT in the e-payment context, refers to how much e-payment users think the service is safe and dependable to adopt [20]. The degree of trust that exists between the advertiser and the customer is essential to their dynamic relationship. Trust is the key success element influencing the adoption of new innovation [21]. According to earlier research, PRT has been validated as a crucial element that favorably affects e-payment adoption [10,22,23]. Therefore, the study formulated the following hypothesis:

H5: PRT significantly affects the users' behavior intention to adopt e-payment.

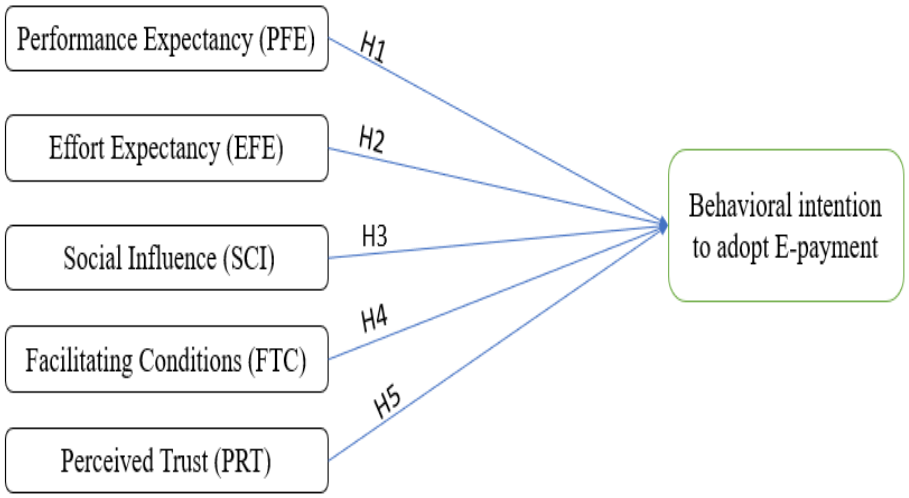

Fig. 1. Conceptual framework

METHODOLOGY

The data for the study was gathered from the e-payment users in NCR by using a structured questionnaire. The questionnaire was made in an understandable language and the participants were made aware that taking part in the study is entirely optional. Initially, a pre-test questionnaire was distributed to 47 respondents. Based on findings and discussions with respondents, the questionnaire

was adjusted to improve the study's outcome. A five-point Likert scale was utilised to create the questionnaire, where 5 represents "strongly agree" and 1 represents "strongly disagree." There are two sections in the questionnaire: the first consists of questions about the demographic profile of the respondents and the second one deals with questions on e-payment adoption. The link to the questionnaire was sent online via e-mail and WhatsApp. A snowball sampling was used by asking the respondents to spread the questionnaire among their network. 350 surveys were sent out, and 257 responses were recorded and used for the study.

RESULTS AND DISCUSSION

A. Data analysis

The paper aims to analyse the antecedents of e-payment adoption in India. To evaluate the proposed structural framework, a smartPLS 3.0 was used. PLS has been presented as a precise technique for analysing the connections between constructs [24]. In the present study, the two-stage strategy was used: Measurement model testing is done in the first and the structural model testing is done in the second.

B. Participants'Demographic characteristics

257 useful responses have been obtained. Interestingly, women made up around 44.7% of the sample, while men made up more than half of the respondents (55.3%). Regarding age, 54.5% of people are in the 18-24 age bracket, while 23.4% are in the 25-35 age range and the senior age group makes up the remaining percentage. Concerning education, the respondents who made use of e-payments were highly educated, with 43% having a degree in masters, 32% having a degree in bachelors, 15% have completed high school, and 10% have not indicated their level of education. On the subject of respondents' adoption of the e-payment system, the results indicated that 70.4% of participants use e-payment services daily, whilst the other participants do not.

C. Measurement model

It is required to assess the measurement model before testing the hypotheses. It is being analyzed to make sure the measures are reliable and that they sufficiently address the theoretical aspects that are recognized. It is assessed by examining its reliability and validity. To assess the validity and reliability, AVE values, Cronbach's alpha, factor loadings, and composite reliability were employed [25]. Table 1 exhibits the results, which indicate that the values of Cronbach's Alpha ranged from 0.861 to 0.912, all of them were above the recommended limit of 0.7. The outcome even demonstrated that the value of composite reliability, which ranged from 0.906 to 0.945, were over the required 0.7 criteria. Consequently, the composite dependability and Cronbach's Alpha internal consistency are both established.

Similarly, factor loading and AVE are used to analyze the convergent validity. All of the values of factor loading in Table 1 exceeded the suggested value of 0.7, indicating that they met the requirements. The results presented in Table 1 also demonstrate that all AVE values fall between 0.706 and 0.851, over the recommended limit of 0.5. The Convergent validity, hence was determined, suggesting that the constructs are appropriate for model testing.

TABLE 1 RELIABILITY AND VALIDITY TESTING

Constructs	Items	Loadings	Cronbach's alpha	Composite Reliability	Average variance extracted (AVE)
PFE	PFE1	0.870	0.887	0.922	0.747
	PFE2	0.889			
	PFE3	0.846			

	PFE4	0.851			
EFE	EFE1	0.811	0.883	0.919	0.739
	EFE2	0.890			
	EFE3	0.892			
	EFE4	0.843			
SCI	SCI1	0.904	0.912	0.945	0.851
	SCI2	0.930			
	SCI3	0.932			
FTC	FTC1	0.848	0.861	0.906	0.706
	FTC2	0.860			
	FTC3	0.807			
	FTC4	0.845			
PRT	PRT1	0.837	0.883	0.919	0.739
	PRT2	0.880			
	PRT3	0.839			
	PRT4	0.846			
BI	BI1	0.889	0.875	0.923	0.800
	BI2	0.900			
	BI3	0.895			

D. Structural model

After the verification of the reliability and validity, the assessment of structural model comes next. This necessitates using a bootstrapping process with 5000 re-samples to determine the path coefficients and the adjusted (R2) [26]. The findings of the structural model are exhibits in table 2 and fig. 2. A strong predictive power is demonstrated by the behavioral intention's adjusted R2 of 0.70. According to the bootstrapping process, three of the five structural correlations were shown to be significant ($p \leq 0.05$).

The result demonstrates that facilitating conditions (FTC) is the most significant factor of users BI to adopt e-payment system (ß = 0.323, t = 4.964). which means the availiability of necessary resources, skills and infrastructure is essential to the users while adopting e-payment services. This finding is in agreement with the past studies [12,13,27]. Thus, H4 is accepted. Following FTC, the second most significant factor of users BI toward e-payment adoption is performance expectancy (ß = 0.315, t = 2.844). Hence, H1 is accepted. It indicates that if consumers think the e-payment system would be more productive, advantageous, and effective in their daily lives, it is more likely to be adopted by them. This result aligns with the findings of previous research [10,12,13]. Moreover, the results also depict that the BI of e-payment users to utilize the system is significantly impacted by EFE (ß = 0.224, t = 2.850). Therefore, H3 is accepted. This result aligns with the outcomes of other research [10,12,28] and may be clarified through the idea that BI to adopt e-payment services increases with the easiness of the system.

Additionally, the BI to use e-payment services was shown to be insignificantly predicted by the social influence (SCI) (ß = 0.067, t = 1.350). Thus, H3 is rejected. This result contradicts the existing research [10,13,27]. This indicates that peer pressure and the opinions of important people have no impact on users' BI to utilize an e-payment system. Similarly, it is also revealed in the study that perceived trust (PRT) has no impact on users' BI to adopt e-payment services (ß = 0.052, t = 1.724). Hence, H5 is rejected. However, this conclusion is opposed to the earlier studies [10,27], wherein the lesser the trust in the e-payment system, the lesser the chances to adopt the services of such a system.

TABLE 2 TESTING OF HYPOTHESES

Hypothesis	Relationship	Std. beta	Std. error	t-value	p-value	Decision
H1	PFE → BI	0.315	0.111	2.844	0.005	Supported
H2	EFE → BI	0.224	0.078	2.850	0.005	Supported
H3	SCI → BI	0.067	0.050	1.350	0.178	Not supported
H4	FTC → BI	0.323	0.065	4.964	0.000	Supported
H5	PRT → BI	0.052	0.030	1.724	0.085	Not supported

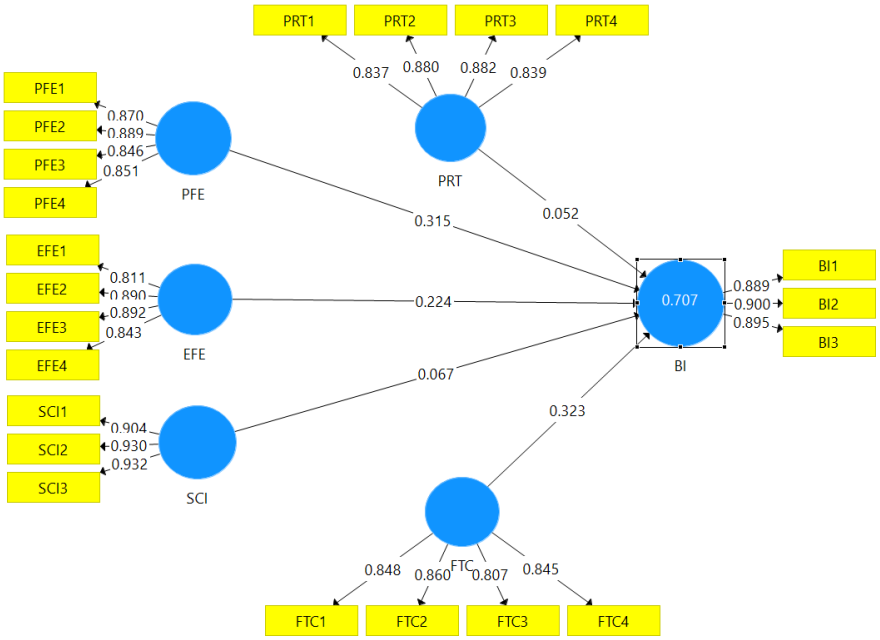

Fig. 2. SEM analysis results

CONCLUSION

The current study aims: a) to identify the key antecedents of e-payment adoption in India and b) to analyse the most significant determinant of e-payment adoption in India. The study utilised an extended UTAUT model to meet the objectives. The statistics provided good support for the study model, demonstrating that it was able to anticipate 70% of the variations in BI. The study results depict that facilitating conditions (FTC) is the best indicator of users BI to adopt e-payment systems in India, followed by PFE and EFE. Moreover, SCI and PRT were found insignificant in predicting users' BI toward e-payment adoption. This finding contradicts the earlier literature, given, which indicates that people still find it difficult to fully trust the digital payment system. Based on these findings, the study may offer sufficient assistance to India's decision-makers in developing the e-payment infrastructure and ensuring that users may make financial transactions at their preferred time and location efficiently and securely via e-payment channels.

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