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Role of intrinsic and extrinsic factors affecting continuance intentions of Digital Payment services

Anup Kumar[1[0000-0002-1116-3230]] , Parijat Upadhyay[1], Sujeet K. Sharma[2]

and Prashant Gupta[2]

[1] IMT Nagpur, India
[2] IIM Tirchi, India
anunwin@gmail.com

Abstract
This paper examines the continual usage intentions of digital payments. It investigates the effects of perceived risk, quality of service, and grievance redressal structure on the Digital Payment Service continuation through the integration of the Expectation-Confirmation Model (ECM) with some of the most researched technology adoption models. The survey was conducted at two different time line, pre and post demonetization in India. The results of the study were compared to the model (pre demonetization in India), suggest that there is a control effect of ease of usage in experience, gender, and age. The effect of hedonic motivation on the desire to use is moderated by age, gender, and experience to a higher degree among young people in the early phases of digital payments also the effect of grievance redressal as a moderator variable was significant.
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Keywords: Digital Payment services, Continuance intentions behavior, Expectation-Confirmation Model, Demonetization.

1 Introduction

The digital payment service is a financial service that has reported gaining popularity in emerging economies. It is essential to study digital service quality, perceived usefulness (PU) of the service, and perceived security of the financial service to explore the loyalty and retention attributes for digital payment services, This study attempts to investigate young consumers' perception of the continual usage of digital Payment services. The study is focused on young and mature end-users(Kennett, Moschis, & Bellenger, 1995). The effects of perceived security, quality of service, and grievance redressal structure on the continuation intention of digital Payment services in emerging markets (Chemingui & lallouna, 2013; Chen, 2013; Jun & Palacios, 2016; Vlachos & Vrechopoulos, 2008) has been explored in this study. This paper has attempted a longitudinal study to identify the factor(s) affecting continual usage intention of

services like digital Payments (M Payment), which has not been reported before by any researcher. Also, the moderating effects of age, gender, and experience on usage intention have been investigated in this study, which is not available in published literature.

The adoption of platform-based (mainly digital) services is expected to witness exponential growth in the near future, particularly in countries where the government intervention has been inadequate. The rate of adoption has been encouraging, and so many new-age start-up companies have built their business models based on digital Payments. It is also projected that young consumers (in the18-30 age group) would primarily fuel this growth through increased adoption. Though there has been considerable research done to study the adoption issues (Gan & Li, 2015; Gao & Bai, 2014; Rakhi & Mala, 2014; Susanto, Chang, & Ha, 2016), there is a dearth of significant published literature on the study of continual usage intention amongst young consumers in developing countries.

The study of continuation intention depends on the multidimensional consumer's expectations and is studied by structural equation models (Gallarza, Arteaga-Moreno, Del Chiappa, & Gil-Saura, 2016). The research on the linkages among intrinsic variables such as value, loyalty, spirituality, and aesthetics and their effect on the satisfaction of service is imperative to predict the continuation of a service. The use of an expectation-confirmation model in predicting the continuation intention has been widely extended in various service conditions (Cheng, 2014; Hamer, 2006; Joo & Choi, 2016; Susanto et al., 2016; Zhang, Lu, Gupta, & Gao, 2015). The research questions concerning the linkages of the demographic and socioeconomic conditions of a region with intrinsic variables are also important to predict the continuance intention of the services (Lan, Zhang, Zhong, & Huang, 2016; Susanto et al., 2016; Walker & Baker, 2000). The perceived risk (PR) of structural reliability affects the quality of service, and hence continuation intention (Hamer, 2006), the effect of PR, should be investigated to predict the usage intention.

2 The theory underlying predictive research model framework

The theoretical foundation of this research is based on the Expectation-Confirmation Model ECM is prominently used for investigation of consumers' post usage behaviors (Bhattacharjee, 2001c). Oliver (1993) opines that Expectation-Confirmation theory (ECT) is instrumental in the promotion of cutting edge goods (Thong et al., 2006). Business organizations must comprehend the factors of users' satisfaction. It should be viewed as an "overall evaluation of technology, which reflects an emotion-based response about the target technology" (Lam, Shankar, Erramilli, & Murthy, 2004).

ECM was developed from two fundamental psychological theories; the first is the Theory of Planned Behavior (TPB) and the second is the Technology Acceptance Model (TAM,). There have been several applications in which the six versions of ECM have been thoroughly studied and discussed (Brown, Venkatesh, & Goyal, 2014). The past decade has seen a substantial surge in experiential research into implementation problems in products and services based on technology. The studies on the use of emerging technologies are primarily focused on Technology Adoption Model(TAM) (Davis, Bagozzi, & Warshaw, 1989), TPB, and Innovation Diffusion Theory(IDT) (Rogers, 2002; Rogers Everett, 1995). The concept behind the use and expansion of the ECM model for this work is largely attributable to the capacity to investigate the pre and post-product interaction, which contributes to an improvement in the model's predictive ability.

TAM suggests that when new technology is introduced to consumers, certain factors affect their decision about the pattern and time of their use. The model has been continually researched and extended, the leading updates being TAM 2 (Szajna, 1996) and Unified Technology Acceptance and Use Theory or UTAUT (Chang, 2012; Williams et al., 2015). A TAM 3 was also suggested in the context of e-commerce, including trust effects and perceived system usage risk.

Digital payment has become the most common and obvious forms of payment in most of the countries. Zhou (2013) highlighted problems of system quality related to the continued use of digital payment services by users. As digital transactions are expected to increase in India in the near future dramatically, issues concerning the acceptance and the ongoing usage intentions of Indian consumers need to be investigated. We have extended the seminal work of Kumar et. al, (2018) to study the effect of demonetization on the continuation intention of digital payments. The paper seeks to examine the factors influencing the continuity of Digital Payment services by examining the hybrid model(Figure1). We also explored the impact of age, gender, experience, and grievance redressal (GR) as the variables moderator and mediator. For the study, the proposed models (Figure 1) have been compared to the model of pre demonetization (Kumar et. al,2018).

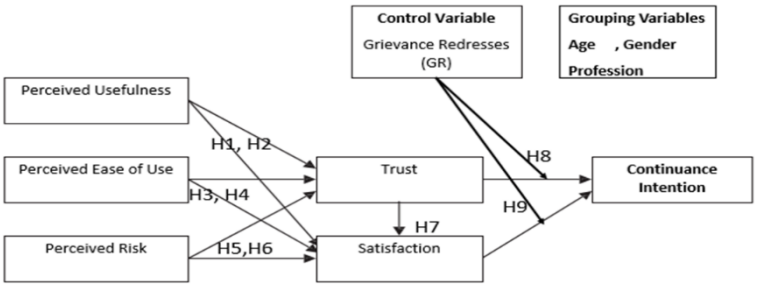


Fig. 1. Proposed Model Post Demonetization.

This paper is organized as follows. The theoretical foundation of the paper has been attempted through the literature review in the next section. Section 4 outlines the research model and hypotheses. Section 5 reports instrument development and data collection. The results of the data analysis are detailed in Section 6, along with the subsequent discussion and implications for business managers. The possible limitations of this study, along with future scope for research, are presented in the conclusion section (Section 7).

3 Literature review and hypotheses development

User behaviors have been distinguished from first-hand application of technologies and the desire of consumers before and after adoption (Bhattacharjee, 2001a). A few hypotheses and models have been used as an interpretation and prediction of technology adoption and diffusion, using TPB, TAM, IDT, and ECM. The prediction of confirmation of the continual usage model (of ECM) extends the principle of TPB and TAM (Bhattacharjee, 2001a). In different contexts, for example, ECM was introduced and extended to research variables that affect continued social network usage (Mouakket, 2015). Customers' value was added as a new construct to accentuate the ECM model (Oghuma, Chang, Libaque-Saenz, Park, & Rho, 2015; Oghuma, Libaque-Saenz, Wong, & Chang, 2016). As this research focuses on the prediction of the continuation intention of the Digital Payment Services, it is also essential to address the variables and constructs employed by different researchers for the study of technology in several circumstances.

Since this research uses a new framework that encompasses PR, so the impact of risk on customer satisfaction needs to be considered (Chiu, Chang, Cheng, & Fang, 2009; Chiu, Chiu, & Chang, 2007; Hsu & Chiu, 2004). The effect on users' continuity of perceived benefit is less than that of PR. By developing a relationship model, multiple behavioral factors that have an emotional impact were discussed (Premkumar & Bhattacherjee, 2008). The EC model has been improved by adding specific variables under different demographic conditions (K.-M. Lin, 2011; K.-M. Lin, Chen, & Fang, 2011).

The easy use of e-learning tools plays an important role (Yen & Lu, 2008). Zhou (2011b) has found in their study that there is a significant association among perceived advantage, endorsement, and gratification whereas, Zhao & Lu (2012) reports that there is a positive relationship between trust and loyalty to user's satisfaction. The study has undertaken, seven latent constructs for the investigation and are listed in Table 1. Five constructs have been taken from the previous studies of these seven constructs, and two latent variables have been developed according to the Indian scenario.

3.1.1. Perceived usefulness: It can be described as users' awareness of the expected advantages of digital Payment usage (Bhattacharjee, 2001c). Post consumption expectations are revealed as ex-post observed usefulness (Jamal & Sharifuddin, 2015). In this study of M-Payment, following hypothesis have been proposed:

H1: The PU of Digital Payment use is attributed positively to satisfaction.
H2: The PU of Digital Payment use is attributed positively to trust.
3.1.2 Perceived ease of use: It is defined as the extent to which physical and mental activities are excluded from a specific system (Hess et al., 2014). Perceived ease of use (PEU) represents the user-friendly nature of the technology that a customer might have perceived (Adams et al., 1992; Karahanna & Straub, 1999). Hence it can be hypothesized as follows:
H3: PEU of Digital Payment is attributed positively to satisfaction.
H4: PEU of Digital Payment is attributed positively to trust.
3.1.3. Perceived risk: While a user makes a financial transaction user always worried about security-related concerns like a steal of login credentials, loss payment, and multiple deductions of money from the account during and after use of Digital Payment(Leong et al., 2020; Madan & Yadav, 2016; Singh et al., 2020; Widodo et al., 2019). Therefore, we hypothesize :
H5: PR of Digital Payment use is attributed negatively to the Trust of Digital payment usage
H6: PR of Digital Payment use is attributed negatively to the Satisfaction.
3.1.4. Trust: It is also an indicator of behavioral intention. Trust for the service primarily for e-commerce and e-banking services plays a vital role in the use of the services (Kim, Shin, & Lee, 2009; Zhou, 2011a). Trust can be described as the desire to be faithful to a technology provider based on optimistic anticipation of future behavior. Trust has the three dimensions: ability, honesty, and goodwill; Several studies (Eid, 2011; McKnight & Chervany, 2001; Nguyen et al., 2013) have found that trust is a crucial component in the continuance of a service or product. Hence, the study proposes the following hypothesis:
H7: Trust in Digital Payment service providers is attributed positively to Satisfaction.
3.1.5. Grievance Redressal: It is a form of management framework structured to resolve conflicts between consumer and service providers (Kumar et. al, 2018). The construct was selected from a focus group analysis where consumers are asked a well-structured question about the proper process of the failed transaction. It is not related to perceived security. In a few cases, even if consumers feel that the system is secure, they prefer those services that assure failed transactions. Such a management system in India is very active and has a constructive impact on the intention of a service's use by consumers. If the user believes that the use of a particular service is secure and straightforward, then the service can continue (Rana, Dwivedi, Williams, & Piercy, 2015). Thus, it can be hypothesized as follows.
3.1.6. Association among GR, trust, and satisfaction: it offers a legal and social guarantee that users have access to some appellate authority in case of fraudulent transactions (Kumar et al., 2018). The presence of such authority generates trust. The trust offers a subjective promise that users would receive excellent service. Furthermore, the trust may affect users' satisfaction and adoption and continuance intention (Upadhyay & Jahanyan, 2016). Thus, trust in the service provider of a Digital Payment has a positive impact on continual usage intention. Therefore, we hypothesize:
H8: GR of Digital Payment moderates the effect of trust on CT.

3.1.7. Satisfaction: Post usage satisfaction always has a high impact on consumer intention to reuse the service (Dağhan & Akkoyunlu, 2016; Hsiao, Chang, & Tang, 2016; Tan, Lee, & Hsu, 2015). Satisfaction, in turn, leads to behavioral intention towards the technology (Venkatesh et al., 2012). Satisfaction represents the cumulative emotions gathered during the use of a product or service (Chow & Shi, 2014). If the customers are not happy with technology, their use can refrain. Several published studies have shown that satisfaction is a critical element in continuity (Hsu, Hsu, Wang, & Chang, 2016; Hsu, Chang, & Chuang, 2015; Mouakket, 2015; Thong, Hong, & Tam, 2006). Thus we hypothesize,

H9: GR moderates the effect of User satisfaction of Digital Payment to digital Payment continuance intention.

3.1.8 Grouping Variables: As indicated earlier in the introduction section, the effect of age, gender, and experience of use have been investigated, establishing them as grouping variables. The effect of these variables had been theoretically verified in UTAUT2 model (Venkatesh et al., 2012). In this research, the controllability of the variables described above is investigated.

4 Research Methodology

4.1 Design of the questionnaire

Relevant constructs were taken from the related literature for the research. The ECM and TAM items were assessed in compliance with Bhattacherjee (2001c). All products were measured on a five-point scale with reliability greater than 0.8 (Table 2). Specifically for Digital payments, a new latent construction (PR) has been derived, which affects the continuation of the user and is measured by a self-derived scale, with reliability greater than .83.

Table 1. Constructs and observed items for the research.

Construct	Adapted from	Questionnaire items
Perceived Usefulness (PU)	(Davis, 1989)	PU1,PU2,PU3,PU4, PU5
Perceived Ease of Use (PEU)	(Davis, 1989)	PE1,PE2,PE3,PE4
Perceived Risk (PR)	Self-derived from the literature	PR1,PR2,PR3
Grievance Redressal (GR)	Kumar et.al, (2018)	GR1,GR2,GR3,GR4
Trust (T)	(Zhou, 2013)	T1,T2,T3
Satisfaction (SAT)	(Oghuma et al., 2015; Oghuma et al., 2016), (Bhattacherjee, 2001a, 2001c)	SAT1,SAT2,SAT3
Continuance Intension (CI)	(Bhattacherjee, 2001a, 2001c)	CI1,CI2,CI3

4.2 Data Collection

A pilot analysis to test the reliability of the initial items in the questionnaire was performed. Thirty questionnaires from telecom service providers and academic experts were sent to the company managers. Since several improvements proposed by them had been introduced, the readability of the items increased and reduced the chance of common method bias and endogeneity. Modified items have been given to postgraduate students of business administration. Data were collected using self-administered questionnaire items from mobile Internet users (in the 18-45 age group) across several Indian States. Convenience sampling was used to get responses. A Google Form for the questionnaire was planned to promote data collection. The Google web form has been submitted to about 1000 users of the online service.

The results were pre-processed by deleting incomplete responses and outliers; two hundred and fifty credible responses were eventually included in this sample for analysis. The sample size was calculated according to Little and Rubin (1989) norms. For this research, a minimum of 170 samples was needed, as the research has 34 objects. The final sample of 250 used in this analysis; therefore, it can be considered as adequate.

The demographic data on respondents are as follows: 150 males (60 percent) and 100 females (40 percent) were among the total number of respondents. Majority of the respondents were in the 18-45 age group (91%). A majority of respondents were graduates (65%), followed by postgraduates (35%). The annual income of respondents' categorization (in Indian Rupee, INR) was as follows: 0-3 (15.7%), 3-6 (18.9 %), 6-9 (22%), 9-12 (17.7%) and above 12 (25.6%).

5 Results

5.1 Measurement Model: Reliability and Validity

To gain information concerning latent factors, exploratory factor analysis (EFA) was initially applied to the items observed. EFA reveals that the EFA fit index value reflects appropriate factor loads with seven latent factors (see Fig.2). The above information was used to establish a theoretical research framework (see Figure 2). A Confirmatory Factor Analysis (CFA) was conducted to reconfirm the adequacy and fit indices of the latent constructs measured.

Cronbach Alpha has been tested for consistency and reliability of the measurement scale. The analysis is accurate enough as values vary from 0.80 to.83 (Bowen & Guo, 2012; Grace, 2008; Hu & Bentler, 1999). Construct reliability has been calculated by the use of composite reliability. The value is between.80 and.854, indicating that both values meet the acceptable range of 0.6 and above(Hu & Bentler, 1999). Convergent and discriminant validity have also been evaluated. Convergent validity of factor

loading, AVE, was assessed. Both items were loaded over normal cut-off 0.6 (ranges from 0.63 to 0.84) as suggested by Bowen & Guo (2012) and Hu & Bentler (1999).

A comparison was made of the AVE (Average Variance Extracted) square root and factor-correlation coefficients, as described in Table 3, to examine the discrimination validity. The correlation of factor below 0.8 indicates ample discriminant validity (Brown, 2015). The construct's square root of AVE was found to be higher than its correlation value, which also ensures discriminant validity (Brown, 2015; Chin & Todd, 1995). Table 3 depicts the construct association, while the diagonal values show the square root of AVE.

5.2. Proposed Model: Goodness of fit statistic, modeling comparisons, and hypotheses testing.

Continuing with the measurement model, the suggested theoretical model fulfills the reliability and validity requirements. In addition, the goodness of fit was evaluated using a structural analysis; the fitness index of the model indicated also above the proposed criteria (Table 2). The model fit was higher than Kumar et al.,(2018), and the findings demonstrate that the suggested theoretical models have better fit indices (CFI=0.95, GFI=0.96, TLI= 0.98, IFI=0.97, chisq/df=1.043, RMSEA=0.016). The results show that the use of GR and perceived security is a better predictor of the continued intention (R2=.377 adjusted) than the Zhou model (2013) (R2=.371 adjusted). In addition to the above, the fitness indices of the suggested model are higher (RMSEA=.061, χ2/df= 1.386) than Kumar et al.,(2018) and Zhou (2013) (RMSEA=.052, χ 2/df= 1.53). In the case of Digital Payment, the findings accentuated the inclusion of GR as a mediator component and perceived safety in the ECM. The fitness indices are shown in Table 4. The proposed model fit metrics even surpass Bhattacharjee's original ECM (2001a).

Table 2. Goodness of fit indices and explanatory power of the model.

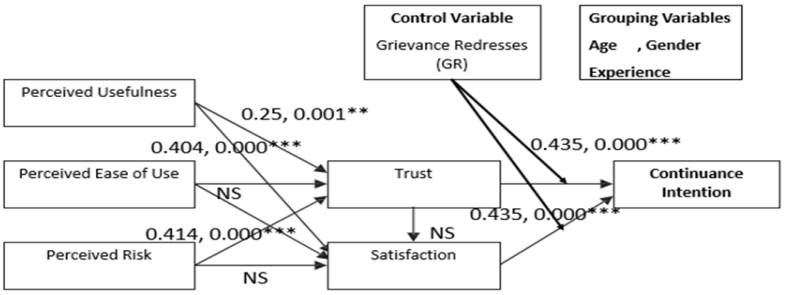
Fit Indices	Chi^2/df	TLI	CFI	RMSEA
Recommendedvalue	<3	>0.90	>0.90	<.08
Proposed Model	1.386	0.928	0.937	0.061
Integrated model of (Kumar et. al,, 2018)	1.53	0.866	0.966	0.052

Note: *chi2/df = ratio between Chi-square and degrees of freedom, CFI = Comparative Fit Index, NFI = TLI= Tucker-Lewis Index and RMSEA is the Root Mean Square Error.*

6 Discussion and Conclusion

The objective of this study was to examine the influence of PR and GR on the continuance intention of young subscribers of digital Payment users in India while taking the PU, satisfaction, and user-friendliness. As shown in Fig. 1A and B, excluding hypotheses H2 and H9, the other hypotheses are accepted.

PEU and PR have significant impacts on trust and satisfaction.PR and utility have a significant impact on GR and trust. The findings also show that PR does not affect satisfaction. The continuance intention can be predicted by GR, trust, and satisfaction. The PEU is the factor among the factors which have the most significant effect (β=0.342), and these findings are following Zhou (2013) and Bhattacharjee (2001c) results. The results tend to corroborate, to some degree, the results of previous research on developing economies (Kim, Lee, & Park, 2011). This research has also provided new ideas in theoretical terms, which appear to resolve the perception of the continuous usage of services such as M-Payment. The original model (Output of R Lavaan) is presented in Fig. 2. Test results are tabulated in Table 3. The comparison of the strength of the relationship amonst variable (Pre and Post Demonetisation) are tabulated in table 5B.



Notes: 2. *P < 0.05, **P <0.001, ***P< 0.000

Fig. 2. Proposed Model results

Fig.2 indicates that GR, moderates the effect of satisfaction, and trust on the continuation intention of digital payments.). In their research, McKnight et al. (2002b) stated that structural safety in the form of an institutional security framework has a major impact on consumer intention (McKnight, Choudhury, & Kacmar, 2002a, 2002b).GR mechanism in the case of failed and fraudulent transactions and their time-bound settlement are necessary to instill trust and confidence in subscribers.

. **Table 3:** Results of Hypothesis

Hypothesis	Estimated	P value	Remark

	Beta			
H1	0.25	0.001	Significant	Supported
H2	0.404	0.000	Significant	Supported
H3	0.073	0.353	Not Significant	Not Supported
H4	0.061	0.459	Not Significant	Not Supported
H5	0.414	0.000	Significant	Supported
H6	-0.006	0.964	Not Significant	Not Supported
H7	0.079	0.581	Not Significant	Not Supported
H8	0.435	0.000	Significant	Supported
H9	0.435	0.000	Significant	Supported

Table 4: : Moderation Effect and comparison of Pre Demonetisation Model with Post Demonetization

Decision variable: continuation Intention	*Model Pre Demonetization*		*Model post Demonetization and*	
	Estimated Beta	**P value**	**Estimated Beta**	**P value**
H1	NS	NS	0.25	0.001
H2	0.271	0.000	0.404	0.000
H3	0.342	0.000	NS	NS
H4	0.115	0.000	NS	NS
H5	0.225	0.053	0.414	0.000
H6	NS	NS	NS	NS
H7	0.358	0.000	NS	NS
H8	NA	NA	0.435	0.000
H9	NA	NA	0.435	0.000

Notes: 1. Table indicates SEM results

2. $^{*}P < 0.05$, $^{**}P < 0.01$, $^{***}P < 0.001$, NS (Not Significant)

There is a control effect of ease of usage in experience, gender, and age. Such results are more dominant in older age women at the initial experience of digital payments. The effect of hedonic motivation on the desire to use is moderated by experience, gender, and age to a higher degree among young people in the early phases of digital payments. These findings are consistent with Venkatesh et al. (2002) and indicate that experience, gender, and age should moderate the impact of habit on behavioral intent and the use of technology. Table 4 findings also reveal that the model (Pre) predictive ability ranges from 0.46 to 0.71 of post demonetisation.

6.1 6.1. Theoretical and Managerial Implications.

From a managerial perspective, the findings are significant for business as over the last few years, costs of smartphones and data have come down significantly. Reduction of costs has attracted more users from tier 2 and tier 3 cities to avail digital-based value-added services like M-Payment. This has presented a big opportunity for businesses to offer more products and services to subscribers in tier 2 and tier 3 cities. Now the digital Payment service provider target low-income group people in tier 2 and tier 3 cities. Digital Payment service providers must have adequate security for a precise grievance redress mechanism. Therefore, digital Payment providers in emerging economies like India will concentrate on showing prospective customers how such a technology-based service would easily handle their transfer payment job (Rakhi & Mala, 2014) but also without risk. Few published studies (Chen, Chen, & Chen, 2009; Cooper & Zmud, 1990; Lu, Hsu, & Hsu, 2005)have reported the significance of the risk factor.

6.2. Conclusion

The study presented in this paper has attempted to investigate young consumers' Continuation intention of digital payment services. The effects of perceived security, quality of service, and GR structure on the continuation intention of digital Payment services in emerging markets have been undertaken in this study. The moderating effects of age, gender, and experience on continual usage intention have been investigated and reported for the first time in this study. Future researchers may get some valuable insights from the findings of this paper and may examine the usage intentions for other age groups as well. It will be equally interesting to learn about the usage intentions in context to developed economies as well.

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