Mobile Payments Systems in India: A Millennial Perspective in Terms of Adoption Readiness, Technology Readiness, and Intention to Adopt

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Abstract

The objective of the study is to derive by means of confirmatory factor analysis, the factors to understand the perspectives of the millennials in India towards the mobile payments systems. The study is to understand and examine Adoption Readiness (AR), Technology Readiness (TR), and Intention towards adoption of mobile payment platforms among millennials in India.

Accordingly, a questionnaire-based survey was conducted on millennials. Total of 857 responses has been included in the study to carry out exploratory factor analysis (EFA) followed by confirmatory factor analysis (CFA).

Keywords: Mobile Payments, Adoption Readiness, Technology Readiness, Intention to Adopt, Millennials

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traditional infrastructure. And these financial technology firms are able to capture this gap with the help of their mobile payment platforms. (EY FinTech Adoption Index 2017 report)

It is essential to study and understand general attitudes of people towards this technology for countries such as India. Accordingly, through this paper, the attempt has been made to understand adoption readiness (AR) for mobile payments platforms and technology readiness (TR) from Indian Consumer perspective. As several of studies bounded by low sample size and generalization constraints, in this paper the effort is to overcome these challenges by surveying large number of respondents across Delhi-NCR region with the help of an online survey. Based on the theoretical aspects, this research will essentially help in underpinning the practical and theoretical implications which will benefit the mobile payment providers and Government policy making the digital financial literacy and widen the reach of these instruments. Major objective of these mobile payment platform providers and government would not only be to ensure the wider adoption of digital payments. Rather they should be focusing on increasing retention rate, increasing digital literacy and digital infrastructure, and building mechanism for transparency and curbing corruption and will make financial literate India and serve all people irrespective of their class, caste, and creed. Adoption readiness studies in India are sparse. Difference between developed word and emerging countries is so huge because of distinct culture, socio-cultural environment, colonized history. There is not much similarity that is found among the developed countries (Sinha & Sheth, Forthcoming 2018). To overcome these countries' specific research work has been prescribed by (Burgess & Steenkamp, 2006). Thus, understanding Indian's adoption readiness especially from millennials perspective will be more valuable to literature and learnings from this paper can be adopted by policy makers and corporates.

2. LITERATURE REVIEW

In literature, significant research has been performed to analyze the user behavior and user adoption readiness towards new technologies and systems. In this regard, Technology Acceptance Model (TAM) which was developed by Davis in 1989, emerged as one of the most reliable models. The model is quite helpful in explaining the behavior and attitude of the people. It proposes that perceived ease of use and perceived usefulness helps in prediction usage of an application. Various studies have been conducted by researchers (Bitner & M.J. 2001; Bitner et al., 2000) on advantages such as customization benefit, flexibility and quality service delivery provided by the mobile payment platforms. Adoption of mobile payment platforms results not only in increasing transparency but also to place a restraint on tax evasion, corruption, and black money with sufficient increase in customer equity and loyalty. It also reduces the transaction cost sufficiently (Rust, et. al., 2003). Literature discusses that rate of technology adoption is dependent on various factors such as user friendliness, ease of use, service interruptions and need/avoidance of service employee and social influence. However, interacting with technology instead of service personnel is considered to have a negative impact on the experiences of service quality, value, and loyalty (Parasuraman & Grewal, 2000). In case of Germany and South Africa, Technology Readiness and Acceptance Model for Mobile Payments was studied, and it was found that "Perceived Usefulness" is the most important factor of predicting the objective of users to adopt mobile payments (Martens et. al., 2017). In case of Korea, the effects of technology readiness and technology acceptance on Near Field Communication (NFC) mobile payment services was studied, and it was found that the four constructs of technology readiness (innovativeness, optimism, discomfort, and insecurity) exert ,significant effect on the perceived ease of use. The two technological characteristics of NFC mobile payment i.e., responsiveness and smartness showed substantial influences on the perceived usefulness (Shin & Lee, 2014). Also, the ease of use, degree of compatibility, belief and human touch can be considered as precursor to the digital banking systems (Mansumitrcha & Al-Malkawi, 2011). A comparison between Thai and Australian consumers' willingness to adopt or intention to adopt (IA) the mobile banking platforms revealed

The Table 5 below indicates that all the factors are found significant in predicting the dependent variable with p value of .000.

Table 5: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.085	.151		-.559	.000
TR_Scale	.245	.085	.174	2.882	.004
AR_Scale	.783	.083	.570	9.428	.000

a. Dependent Variable: IA_Scale

6. CONCLUSION AND IMPLICATIONS

World is witnessing the creative destruction and disruptive innovations. Novel concepts and technologies in the field of artificial intelligence, machine learning, among other have transformed not only the economic activities but also the way of life. Most innovations in the digital field are disruptive or the one which displaces an existing product or method. In this context understanding the general attitudes toward technology, would strengthen our knowledge base especially towards mobile payment systems and their adoption rate. This study has focused on the overall understanding about technology and its technological advancement with a reference to mobile payment platforms development. Adoption readiness and technology readiness influences each other and create favorable environment towards behavioral change towards customer retention and leapfrogging the digital literacy.

The sample used for the study is small in size and hence, the study can be conducted with the larger sample size. Also, the study has been conducted on educated millennials having operational bank accounts and access to the Internet. The study may be applied to other customer segments as well. The study helps future researchers interested to explore technology adoption and the derived results and theoretical model will add value to the existing literature. This research paper has various other implications on policy makers, corporates and will compliment government and NGOs efforts

towards increasing the financial literacy and infra and initiatives such will be BHIM-app, UPI would be instrumental as well beneficial for managerial point of view. The key findings of this paper would be useful for fintech firms to design their marketing mix including digital marketing landscape so that it can ensured that users will move towards digital financial medium from traditional finance mediums.

This study will also help understand the implications on go-to-market strategy adopted by the industry players on mobile payments. Demonetization has a significant impact on digital economy (Sen, 2017). However, there are several barriers and fraught with multiple challenges. Due to these factors, there has been sporadic growth of these payment planforms and resulted in lower usage and low retention rate of these digital platforms. There is an ardent requirement of crystal clear, multidimensional policy engaging all stakeholders such as new financial firms driving on technology, government bodies, corporates, MNCs. New technology-based entrant has to be incentivized if it is following rules of business.

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of mobile payment platforms in India except for megacities and some tier-1 cities. Also, most of the mobile payment platforms have low retention rate of customers and lower usage. Hence, real number of active users is sufficiently low. There can be several reasons for this such as low internet penetration, lower speed of service providers, lack of financial regulations etc. Hence, this paper considers willingness to adopt payment platforms as a dependent variable in this model.

Figure 1: Conceptual Model
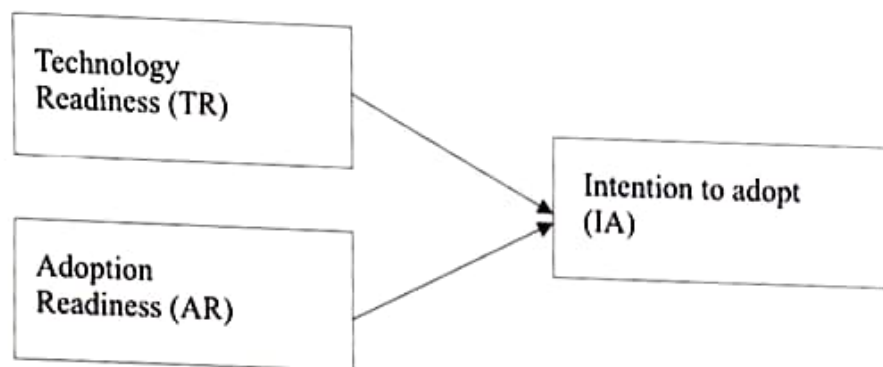
4. RESEARCH METHODOLOGY

For the study, a structured questionnaire was adopted to measure the constructs. The conceptual model consisted of three constructs. Each of these three constructs were measured using multiple items. These items were taken from various well researched models. Ten items were used to measure Adoption. To measure technology readiness, 3 items were considered. Two items have been used to measure the intention to adopt. Questionnaire also consisted of items to measure awareness, demography etc. Total of 15 questions on a 7-point Likert scale were incorporated in the questionnaire for the survey. The questionnaire comprised of three sections pertaining to technology readiness, adoption readiness, and intention to adopt. The data for these three constructs was collected from the questionnaire-based survey floated online among millennials. A total of 857 responses were included in the study.

5. ANALYSIS AND FINDINGS

The reliability and validity of the questionnaire were established. The internal consistency (Cronbach's $\alpha = 0.884$) was met for the scale. The data was analyzed using Statistical Package for Social Sciences SPSS v.21. Methods used for analysis consists of descriptive data analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and regreassion analysis. Within CFA, goodness-of-fit, convergent validity, discriminant validity and composite reliability were also conducted. The first step consists of extracting the factor structure of the research framework. To do this, principal component analysis (PCA) was performed to reduce the larger set of variables to a categorized and more manageable set of scales. Before performing EFA, another important parameter is Kaiser-Meyer-Olkin (KMO) Test that is a measure of how well the data is suited for factor analysis. The test is run to measure the sampling adequacy for each variable in the model along with the complete model. The high value (close to 1) of KMO test indicates that a factor analysis may be useful with the data. The result of Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.859 indicating that the sampling was adequate. Another test which is Bartlett's Test of Sphericity is also used to assess the equality of variance in different samples. Small values (less than 0.05) of the significance level specify that a factor analysis may be useful with the data. The result of Bartlett's Test of Sphericity was 0.00. The table 1 below represents the results of KMO and Bartlett's Test.

Table 1: Results of KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.859
Bartlett's Test of Sphericity	Approx. Chi-Square	701.424
	df	105
	Sig.	.000

Post KMO and Bartlett's Test principal component analysis (PCA) was performed on the items with varimax rotation and three factors were extracted. These three factors are labelled based on items included in each of them. The total variance explained for this is 58.091%.

To achieve the objectives and to confirm the psychometric properties of the scale used, he results of exploratory factor analysis were tested using measurement model. On this measurement model, a CFA was performed to understand the strength of each variable in explaining its respective construct. Accordingly, CFA of measurement model is applied using AMOS 21. After identifying the constructs and their respective explaining variables, confirmatory factor analysis was performed as shown in figure 2.
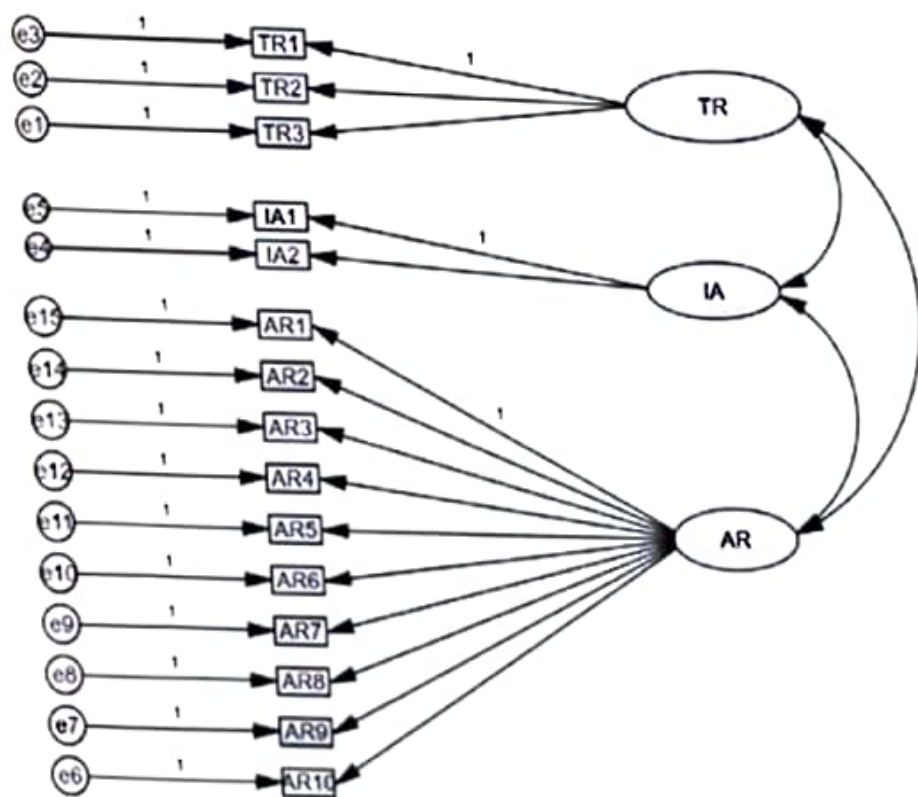

Figure 2: Confirmatory Factor Analysis

that perceived usefulness and risk are essential but perceived ease of use was more critical for Australians compared to Thai consumer whereas perceived Social Influence (SI) was found to be more important in Thailand. Parasuraman & Colby (2011) mentioned that there are three key relationships from mobile payment platforms' point of view, these are that of, consumer and technology, consumer and transaction and transaction and technology. Consumer technology relationship can be defined as how easily a consumer can use or interact with technology (Parasuraman & Colby, 2001). Here, one needs to understand the speed of technological advancement as this is complementary factor in order to flourish this relationship. Technological changes carried in India, itself represent a rapid movement from landline phone to smart phone, and with Internet of Things (IOT) and Artificial Intelligence this change will be faster. Consumer and transaction relationship can be defined as how easily a consumer use mobile payment platform to do financial transaction. TAM model considers key aspects "perceived ease of transaction using technology", "adoption of technology". Further, the unified theory of acceptance and use of technology (UTAUT) was developed. This model helps in identifying the cultural differences (Venkatesh et al., 2003). Though this model fraught with correlation issues. To overcome this, adoption readiness (AR) construct was conceptualized and framed (Thakur & Srivastava, 2014). AR will part of this research study as well. The consumer - technology interface entails attitude towards technology. This can be evaluated by Technology Readiness, i.e., consumers' overall feeling of ease or unease with the use of technologies for life and work (Parasuraman & Colby, 2001). In emerging economies such as India, technologies are relatively new where some new technologies succeed, over others. In the technology disruptive era, continuous technological change may be a supporting factor.

3. RESEARCH OBJECTIVES AND CONCEPTUAL MODEL

The objective of this study is to understand and examine Adoption Readiness (AR), Technology Readiness (TR), and Intention towards adoption of mobile payment platforms among millennials in India. Based on the studies from both, developing world and developed world, and some key learning from both the markets, developed as well as emerging markets, this study discusses the theoretical model and underlying concept is subsequent section.

Technology Readiness: Consumers' technology adoption decisions are based on the Individuals' area expertise and experiences impact on (Rogers, 2003). When clients involved co-produce services their attitudes contributed to their technology adoption propensity (Bendapudi & Leone, 2003). Both, positive and negative reactions may coexist on technology and accordingly, different positive and negative reactions are expected towards technology. Therefore, individual can be placed alongside hypothetical technology–beliefs scale within the two extremes, one is strongly positive and other being strongly negative. This can be correlated to their propensity to adopt and embrace new technology. Technology Readiness (TR) is the tendency to use, clinch and utilize innovative technologies for achieving individual personal and professional objectives (Parasuraman & Colby, 2001). The TRI deals with broad range of negative and positive thoughts about technology. (Venkatesh & Davis, 2007).

Adoption Readiness (AR): With the advent of UTAUT, that is unified theory of acceptance and use of technology (UTAUT) study has proposed the framework of eight models (Venkatesh et al., 2003), and resolved shortcoming of the TAM model, following aspects need to be considered in evaluating the adoption readiness. These are perceived ease of use, perceived usefulness and cultural aspects. Numerous researchers identified that some of the constructs are similar and have correlation issue between them (Wessels & Drennan, 2010). According to few other researchers, four UTAUT constructs have correlations between all (Curtis et al., 2010). Consequently, in place of four separate constructs (Thakur & Srivastava, 2014), researcher developed a complete construct called AR that treat each of them as one dimensional. From the study, it was deciphered that these constructs have full blown impact on adoption rate.

Intention to adopt (IA): There is lower adoption

1. INTRODUCTION

India is among the fastest emerging economy and one of the hotspot markets. There is considerable population that has been living without bank account and skills to access to banking facilities. Considering this and the increasing penetration of the Internet and smart phones, digital technology reach and mobile payment systems has potential to resolve these problems or reduce their impact on large amount of people in India. With the growth rate more than 7 percent and initiatives by the government such as Demonetization, Digital India, UPI, RBI sustained efforts in payment digitization, it will expand the access to financial services and will drive towards more efficient, more effective financial literate India. Indian digital financial market is sought to have faster growth rate and it can be expected that it will be USD $1 trillion by 2023. It is already witnessing tremendous growth rate in mobile payments transactions. At the same time, it offers big opportunities for corporates as well entrepreneurs. As per a report by Credit Suisse on 'Digital Payment: Trends, Issues and Opportunities', it is estimated that the mobile payments would rise to $190 billion by 2023 from $10 billion in 2017-18. Number of Internet mobile phones users in India, has reached to 351 million in 2017. Further it is expected that this number would be 500 million by 2023 (Statista). In case smart phone segment, this penetration stands at only 28% percent of the population in India. As per the RBI annual report, mobile banking services observed a growth of 92% and 13% in terms of volume and value, respectively. The registered customers soared by 54% to 251 million in March 2018.

Though cash is still considered the desired mode of payment across Asia. A report by PayPal, states that the 57% of Indians chose to use cash in spite of the drive for a cashless economy. Another interesting finding was that about 90 to 95 percent of vendors did not have sufficient digital infrastructure to support digital transactions (Wade, 2017). Even though the government boosted hard for the use of digital mode for payments and even after demonetization, there is sluggish understanding of the concept of digital payment in rural areas. There is still reluctance among people to adopt digital payment modes in tier-II and tier-III cities.

Demonetization compelled many non-digital users to adopt digital or a mobile transaction. The cash transactions from ATMs increased 22% to 2.6 lakh crore Rs (RBI annual report, April 2018). It is encouraging to witness a growth of 37% in the overall volume of the digital payments which were about 1.9 billion as that of 1.4 billion in April 2016 (NITI Aayog, 2017).

Mobile payment platforms are facing many challenges such as low customer acquisition, lower ROI etc. But things have been turned especially after demonetization and swift change in sign-ups, but less usage or retention is the main cause of worry apart from fragmented market, new players and volatile market shares. One of the key learning from the failure of several new entrants, pointed out that the factors for the adoption of mobile payment are not crystal clear. An established example is that of popular M-Pesa, which worked in Kenya (Anyasi & Otubo, 2009) but failed to give similar results in India (Iyenger, 2016).

A mobile payments platform is considerably a new phenomenon in the domain of digital fin-tech world. Though there are several studies and research work has been carried on them for past 20-25 years. Findings of these studies unlikely to point out mobile payment platform adoption readiness in India for multiple reasons such as studies carried in developed countries have low relevance compared to emerging countries, use case of these developed countries are different, factors responsible for adoption in one country, would be different, socio-cultural diversity, education level. However, some studies are based on emerging market but due to insufficient sample size lacks capabilities to generalize the same for India. Globally there is an average of 33 percent of financial technology adoption rate and an average of 46 percent financial technology adoption across emerging economies such as China, Brazil, Mexico and India. The primary reason for such high adoption in emerging market can be understood by the factor that these firms are able to tap technically the literate population in spite low financial infrastructure. Emerging markets are growing rapidly, and their middle class is widening on much faster rate. Also there is faster growth in broadband services as compared to growth in financial service provider or building

Model fit summary and moderating constant are represented by the respective fit statistics in table 2. The model fit results recommend satisfactory overall model fit.

Table 2 : Model Fit Indices

Measure	Threshold	Model Statistics
CMIN/DF	<=3.000	1.71
IFI	>=0.900	0.935
CFI	>=0.900	0.934
TLI	>=0.900	0.922
RMR	<=0.100	.083
RMSEA	<=0.080	0.058

5.1 Convergent and Discriminant Validity

The AVE values for all the constructs that are studied are tested and the found to be greater than the minimum recommended value of 0.40. Further the square root of AVE for each of the construct considered in the measurement model, as reported in the diagonal of the correlation of constructs matrix is larger than the corresponding off-diagonal correlations of the construct to their latent variables. These two measures of the model confirmed convergent and discriminant validity of the questionnaire. The results of the CFA indicates that all the fit statistics index has met the requirement condition as indicated in the table 2.

Hence, the data gathered is fit with the measurement model of learning environment based on CFA.

5.2. Regression Analysis

Further regression analysis of the factors is performed where Technology Readiness (TR) and Adoption Readiness (AR) are considered as independent variables and Intention to adopt (IA) is considered as a dependent variable. The model summary presented in Table 3 indicates R square value is 0.785 depicting that 78.5% the total variation in dependent variable is explained by the independent variables.

Table 3 : Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.882a	.785	.780	4.64

a. Predictors: (Constant), AR_Scale, TR_Scale

The table 4 below depicts the F value which is found to be significant at .000 indicating that independent variables reliably predict dependent variable.

Table 4 : ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	76.566	2	38.283	90.703	.000b
	Residual	88.212	209	.422		
	Total	164.778	211			

a. Dependent Variable: IA_Scale
b. Predictors: (Constant), AR_Scale, TR_Scale

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