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Expansion of digital payment adoption using task-technology fit and trust

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Abstract

The rationale of the study is to a developed theoretical model that covers significant drivers for mobile wallet adoption. In the current study, Task-Technology fit, trust, risk, and cost construct are empirically tested. Samples were collected using online and offline techniques. A total of 700 samples collected from Gujarat. After removing missing values, 479 usable were further analyzed. Structural equation modelling techniques were used for further analyzing the data. One of the exciting findings of the study is that Task-Technology fit emerges one of the most significant factors, which influence the behavioral intention of consumers to adopt mobile wallets. Trust, risk and cost are other significant factors based on their influencing level. The study provides a new theoretical model in the information system's technology adoption branch.

Key words:

TTF=Task Technology Fit, SEM=Structural Equation Modeling, CFA=Confirmatory Factor Analysis, Mobile payment.

Introduction

The digital payment system is making the big wave for the retail market, and especially the mobile wallet has gained attention more in all economies (Kumar & Venkatesan, 2019). The mobile wallet which acquired attention and rapid acceptance is taking place among consumers across the globe. The penetration of mobile phones has increased, the availability of "Mobile Wallet" among users. Such penetration has increased the number of players who can provide mobile wallet services to consumers. According to the Google-BCG report, current digital payment is dominated by the micro and small transaction. According to RBI Digital Payment Report (2019), is expected that the mobile wallet will dominate the digital payment, it will contribute up to 30% to the total digital transactions. It is expected that mobile wallet adoption and use will grow at a rapid pace. Thus a scientific inquiry is required of technology adoption from a consumer perspective is required.

Mobile wallet, digital wallet or e-wallet are the words which are used interchangeably, to indicate mobile wallets. A mobile wallet is an application that integrates the user's bank's accounts with the phone, which helps users to make financial transactions. Mobile wallet is mobile payment systems, which provides the facility to users to make digital payment using the mobile phone (Shin, 2009). According to Amorson & Watanabe (2012), a mobile wallet is a multipurpose application, which can be used to carry out the low-

cost transaction.

A mobile wallet is a form of payment that enables users to conduct payment electronically using mobile devices, which can be replaced with a physical wallet, which helps the consumer to complete the transaction at the merchant location (Shaw, 2014). According to Hoofinagle et al. (2012), any payment which is made using a mobile wallet is one of the most convenient methods to make a digital payment, which reduces risk, increases security and reduces the overall cost of the transaction. A mobile wallet is a modern application, which can add debit/credit cards, details to received and send money for goods and services (Metamba & Li, 2017).

According to Singh, Srisvatava, & Sinha (2017), the mobile wallet is one of the instruments to carry out a mobile financial transaction using the mobile phone. Mobile wallet is a technology which will be installed on a smartphone which can store money to carry out financial transaction directly from the mobile wallet (Singh, Sinha, & Cabanillas, 2019). In the context of mobile wallet, many researchers have empirically tested different research model and make changes, which are based on their context to test empirically, which drives users to adopt the technology.

Information systems literature already identified the drivers in the form of TAM and UTAUT, a theoretical model. According to Venkatesh, Thog, & Xong (2016), theory development in the domain of information systems has reached its peak, this required new direction for further development. One such direction is to incorporate theories from other domains and the expansion of existing theories by adding relevant constructs. Based on the suggested direction, the current study has taken Task-Technology to fit the theoretical model as a base model. The TTF model further expanded by adding trust, risk and cost construct.

TTF model suggests that users will adopt and use that technology which suffices their need to carry out tasks efficiently. The adoption of a new information system much depends on the balanced fit between task and technology (Kim, Chan & Gupta, 2016). The fit between technology and task will determine the adoption of technology by end-users (Zhou, Lu & Wang, 2010). Researchers widely use the TTF model. TTF model empirically tested with a combination of other theoretical models such as TAM, UTATU, and UTAUT2, it enhances the explanatory power of suggested theoretical models (Dishaw & Strong, 1999; Parkes, 2013; Lin, 2012; Liang et al., 2013). The current study is the first attempt to develop the TTF model as the base model and expand the theory.

The first objective of the study to identify the influencing factors which drive the consumer's behavioral intention to adopt a mobile wallet, the second objective is to integrate the influencing factors into the TTF and the third objective is to empirically test the theoretical model in the context of a mobile wallet.

The preliminary part of the paper contains a theoretical background, followed by literature reviews and hypothesis development. The third part contains the research methodology followed by analysis, discussion, and the future scope of the study.

Theoretical Background and Hypothesis Development.

Task-Technology Fit

is a widely used theory in the domain of information systems? TTF is developed by (Godhure & Thompson, 1995). The underlying argument of TTF is that if users are not able to find the technology which effectively and efficiently carries out their task, the user will not adopt that technology. TTF captures one of the crucial factors which explain how technology leads to performance improvement. It provides links between the performance and developing better technology, which mainly addresses the

information system adoption issues.

The adoption of a new information system is much dependent on the balanced fit between task and technology (Oliveira, 2014). Since its inception, TTF has been widely used and combined with other models such as TAM, TPB, UTAUT, and UTATU2 to explain behavior intention towards adoption technology (Zhou, Lu & Wang, 2010) (Dishaw & Strong, 1999; Parkes, 2013; Lin, 2012; Liang et al., 2013).

TTF was combined with TAM to check the e-commerce adoption among undergraduate students of USA; the study found that it has increased the explanatory power of the model which has impacted on ease of use (Klopping & McKinney, 2004). The adoption of location-based information systems among consumers has found that TTF plays a deciding role in the adoption of technology (Junglas et al., 2008). According to Parkes (2013), a balanced fit between the user's task and technology has a positive impact on performance, which will increase the adoption of technology. The imbalance fit between tasks and technology will negatively impact on performance, which will have an inverse effect on the adoption of technology.

Empirical evidence shows that the interaction between task and technology characteristics affects users' behavior intention to adopt blogs, which further determines their usage (Zhou, Lu & Wang, 2010; Shang et al., 2007). Further, continuous usage of e-learning tools better explained by the inclusion of task technology fit in the model (Larsen & Sorebo, 2009). Mobile internet usage was also empirically tested along with the TTF construct to extend the rationality of adoption (Shin et al., 2009). In the mobile banking context, the task-technology fit influenced behavioral intention to adapt significantly by (Oliveira et al., 2014). Social networking site adoption was empirically tested by adding social constructs into TTF. Social construct has a very strong positive impact on behavior intention to adopt the technology. The researcher has argued the TTF needs to be revised by adding social constructs into it (Lu & Yang, 2014). Based on this discussion, it was derived that:

H1: Task technology fit influence the behavioral intention to adopt mobile wallet.

Trust

Trust is a multifaceted construct. It is easy to talk and difficult to pin down (Keen et al. 1999). Thus trust is one of the essential factors to examine for scientific inquiry on online purchases. For online purchases, consumers do consider various elements, but trust plays one of the deciding factors for consumer's purchase intention. Trust helps consumers to overcome the perception of risk and uncertainty. It helps consumers to establish trust in vendors and suppliers, especially when sellers and buyers physically separated. Building a trustworthy relationship between consumer and vendor is a costly and time-consuming process.

People's general tendency to trust is one type of personality trait (X. Luo et al. 2010). According to Gafen et al. (2003), trust plays a central role in building an unknown relationship. A study conducted to check online shopping has identified that, trust plays a significant role in building consumer's purchase intention. The study has also identified that trust is one of the critical indicators for e-commerce companies (Al-Debei, Akroush & Ashouri, 2015). According to Samul, Balaji & Wei (2015), online shopping using the app is the new mode of purchase compare to offline shopping, consumers show a low level of trust which restricts them to try our new things.

Trust is one of significant for business development and maintain the consumers, online shopping vendor's needs to build their application in such a way that, the consumer should feel that application is dependable, reliable and safe to carry any transaction (Bilghan, 2016). People are heavily relying on the ratings, reviews and other people's experience for e-commerce webs site argued (Sharma, Menard, & Murchler,

2017). Earlier studies have found that trust has a direct and influencing link to consumer's online purchase intention (Beldad, de Jong, and Steehouder 2010; Agag & El-Mastry, 2016).

Based on the above literature below, mention the hypothesis proposed.

H2: Trust influences the behavioral intention to adopt mobile wallet.

Risk

Risk measures the beliefs of the uncertainty regarding possible negative consequences. Risk in online transaction context is feeling insecurity in making payment. The risk associated with a product or service has gained significant importance in consumer research (Mitchell 1999; Lim 2003; Schierxm Schilke & Wirtz, 2010). According to Wu & Change (2007), the risk is one of the deciding factors for consumer attitudes towards adopting and use the mobile app. A study conducted by Lu et al. (2011), found that risk negatively impacts use behavior. Similar findings were reported in various studies conducted in China, Brazil and Bangkok (Cruz et al., 2010; Sripalawat et al., 2011; Yao & Zhong, 2011) reported by Thakur & Srivastava (2014). The study conducted to check the intention to adopt online shopping has found that product purchasing the product-related risk creates uncertainty in the consumer mind (Lee, 2017). According to Shuang, Leszczyc, & Lin (2017), risk significantly influence the purchase intention of e-Commerce consumer. Online purchase creates a high level of risk in consumer compare to the traditional retail purchase (Lee & Tan, 2003). The decreased level of risk will increase online shopping argued (Change et al. 2016).

Based on the above mention literature we are proposing.

H3: Risk influences the behavioral intention to adopt mobile wallet.

Cost

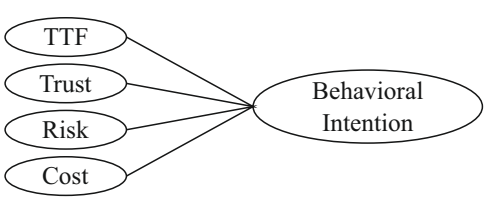
The concept of cost derived from the transaction cost theory (TCT) (Williamsons, 1998) it is used in information technology outsourcing decisions for the organization (Alaghehband et al., 2011). Direct cost and indirect cost are the two main dimensions of cost. The cost highly influences behavior intention to adopt digital payment and mobile banking. Transaction costs and service charges are two examples of the direct cost that the customer pays the bank to carry out digital payment (Yang, 2009).

Cost plays a significant role in the adoption of 3G mobile services in Malaysia (Carlsson, Walden, & Bouwman, 2006). As per (Abdinoor & Mbamba, 2017) cost negatively impacts the intention to adopt the technology. Thus, the following hypothesis developed:

H4: Cost influences the behavioral intention to adopt mobile wallet.

Based on the above discussion, the following research model proposed:

Figure 1 Research Model



Research methodology

Survey Instrument

A structured questionnaire was developed to collect responses that capture self-reported behaviors. The scale items for Task technology fit construct was adopted from (Klopping 2004; Larson, Sorebo & Sorebo, 2009; McKinneys, 2013). Cost construct was adopted from (Teo & Yu, 2005). Items for trust and risk are adopted from (Belanger & Carter, 2008). Trust All items were measured on a five-point Likert type scale ranging from 1 (strongly disagree) to 5 (strongly agree). There are three demographic questions (age, gender, and education) which included in the questionnaire. A pilot study was conducted to get accurate responses. This pilot group consisted of academicians, working professionals, and university students. The pilot group suggested a few changes that incorporated in the final version of the instrument.

Sample Selection

This study consists of adults whose age is above 18 years; as the mobile wallet carries digital financial transaction, adults whose age is above 18 were selected. Using convenient sampling technique 700 samples were collected. Samples were collected using online and off line method. For online method link of Google form was shared with potential respondents. After scrutinizing the data by eliminating missing values, 479 usable samples were further process for analysis. Samples were selected from the Ahmedabad, Bhavnagar, Surat, Baroda, and Rajkot city.

Demographic profile and characteristics of respondents

Table 1 shows the descriptive statistics of the consumers surveyed. Out of a total of 479 samples, 63% of respondents were male, and 37% were female. Age-wise, 64% of respondents were within the age group of 18-23 years, followed by 17% who were between of age group of 23-29. Remaining 14% of respondents were within the age group of 30-53. On the occupation parameter, out of total respondents, 37% were students, 19% fell under the private service category, 6% were government employees, 4% have their own business; 3% were self-employed, and the remaining 1% of respondents were pensioners. On the education parameter, 63% of respondents were graduates, followed by 25% who had completed schooling and joined an undergraduate program, and 11% of respondents had completed post-graduation.

Demographics Characteristics	**Frequency**	**%**
Gender		
Male	300	63
Female	179	37
Age		
18-23	327	68.3
23-29	83	17.3
30-34	32	7
Above 35	37	8

Demographics Characteristics	Frequency	%
Education		
Graduation	301	63
Up to Schooling	120	25.1
Post-Graduation	52	11
Ph.D.	6	1.3
Occupation		
Student	319	66.6
Government Service	28	5.8
Private Service	93	19.4
Business	19	4
Self Employed	15	3.1
Pensioner and others	5	1

Note: n=479

01

Data Analysis

To empirically test, the hypothesis structural equation modelling technique is used. "Structural equation modeling (SEM) is a technique for estimating causal relations applying a combination of statistical data and qualitative causal hypothesis. Earlier researchers have recognized the potential of SEM in distinguishing measurement and structural models, and considering measurement error" (Oliveira et al., 2016. p.6).

Reliability and Validity

Confirmatory factor analysis was carried out to access the reliability and validity of the construct of task technology fit, trust, risk, cost, and behavior intention. Three items from cost construct (C2, C5, C6, and C7) items were erased due to poor factor loading. Table 2 indicated the results of reliability and convergent validity. The standardized loading of all the variables was significant (Fornell & Larcker, 1981). All the constructs have an average variance extracted above 0.5 and composite reliability above 0.7, which indicates the establishment of construct validity. All the constructs which are mention in table 1 and 3 able to meet the criteria of CR and AVE. The overall model-fit indices for measurement mode is (DF=158; $P<0.05$; $\chi 2/DF=2.072$; GFI =0.91; TLI=0.949; CFI=0.95; RMSEA=0.04) (Han, Hsu & Sheu, 2010). All fit indices are satisfactory.

Table 2: Reliability and Validity

Sr. No.	Variable	Cronbach's α	CR	AVE
1	Task-Technology Fit	0.84	0.85	0.58
2	Behavioral Intention	0.86	0.86	0.56
3	Risk	0.78	0.79	0.55
4	Trust	0.77	0.83	0.51
5	Cost	0.72	0.77	0.50

Structural model

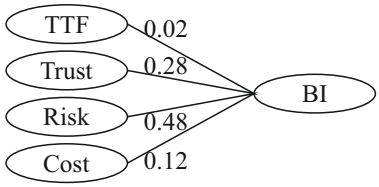
Structural Model was estimated for all independent variables, Task-Technology Fit, trust, risk and cost load on behavior intention. Explanatory power and model fit indices are mentions in table 4.

Table 3: Explanatory Power of model and fit indices of model

Paths	Coefficients (β)	t-value	P Value	Hypothesis Supported
Riks →BI (+)	0.02	0.45	.065	No
Trust →BI (-)	0.28	4.43	***	Yes
TTF →BI (+)	0.48	6.15	***	Yes
Cost →BI (+)	0.12	2.07	0.03**	Yes

Note: *p<0.01;**p<0.05;***p<0.001

Figure II: Structural Model Modified UTAUT



Analysis of the hypothesis was carried out by using SEM. The result indicates that the theoretical model is an acceptable fit to the data. Standardized path and coefficient were measured using model fit indices.

Table 4: Model Fit indices

Fit Indices & R^2	Suggested	Achieved
Df		158
X^2/df	2 to 5	2.11
GFI	> 0.90	0.93
RMSEA	< 0.08	0.04
CFI	> 0.90	0.96
NFI	> 0.90	0.92
TLI	> 0.90	0.95
PGFI	> 0.5	0.7
PNFI	> 0.5	0.77
R^2	Behavior Intention	0.66

Standardized coefficient estimates indicated the path between TTF and behavior intention (β=0.48; t=6.15, p=<0.001), between trust and behavior intention (β= 0.28; t=4.43, p=<0.001), between risk and behavior intention (β=0.02; t=0.45, p<0.065), and between cost and behavioral intention (β=0.12; t=2.07, p<0.03).

The model explains a 60% variation in behavior intention. Among all the construct task technology fit, is the most significant construct, followed by trust and cost. An interesting finding of the theoretical model is the Task-Technology along is able to explain more than 45% variance in behavioral intention.

Discussion

The contribution of the study was to identify driving factors that impact behavioral intention for mobile wallet adoption among consumers. The study finds that task technology fit has significant direct effects on behavior intention. This is one of the interesting findings of the study. Task technology fit has emerged as one of the important predictors of behavior intention with the highest coefficient value of (0.48). These findings are in line with (Oliverial et al., 2016). This finding indicates that there is a need to enhance the model by adding more predictors on the technology side as indicated by (Venkatesh, Thing & Xu, 2016).

The study highlights that trust is another construct that influences the behavioral intention of consumers to adopt the mobile wallet. Risk emerges non-significant over the behavioral intention, as consumers already build that trust, so it has resulted in non-significant; these findings are in line with (Ponce et al., 2017). There can be two main reasons for the non-significant effect over behavioral intention. The first reason is that awareness about the basics of technology adoption among consumers has increased. Second is that users are easily able to find resources that provide necessary support and help.

In the present study cost construct also emerged as one of the predictors of behavioral intention. One of the reasons is that the consumer perceived that mobiles do not have any cost association while using. Results suggest that users do consider using the cost associated with every transaction, which is being carried out by mobile wallet. Cost includes transaction cost, internet cost, up-gradation or mobile wallet cost, and these findings are in line with (Emad, Person & Setterstorm, 2011; Baptista & Oliveira, 2016).

Theoretical implications

One of the major contributions of the study is to extend the Task-Technology Fit, by integrating construct from other dominant theories. In the domain of information systems, research TTF model is not used as a base model, it been always used as the second model which enhances the explanatory power of another theoretical model like TAM, UTATU, and UTAUT2. Expansion of TTF with the new construction will expand the theory, of information systems in a new direction, and it will take it to the next level.

The key contribution is the perception that consumers have a shift for basic adoption of technology to task-specific adoption; thus, TTF has emerged as one of the most significant factors among all factors which influence behavior intention. The rationale of the study was to develop an inclusive theoretical model that covers significant drivers for mobile wallet adoption, which supported.

Limitation and Future Research

The limitation of the study is that as the mobile wallet is a newly introduced form of digital payment; findings may differ for the more specific digital payment options. The second limitation is that relevant variables like personal innovativeness, risk, overall awareness of digital payment, and government policy could be included. Covariance technique is used to check the relationship among the drivers, which is another limitation of the study, and need to be taken into account while replicating this study. The study has not used any demographic variables as moderators.

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