

Influence of Gender and M-Banking Self-Efficacy on Mobile Banking Acceptance: An Extended Technology Acceptance Model

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ABSTRACT

The purpose of this study is to validate the applicability of Technology Acceptance Model (TAM) in mobile banking perspective and explore the gender differences and m-banking self-efficacy as external variables. From the review of previous studies, it revealed that very few studies had developed research models statistically validate the role of gender on the intention of users to adopt mobile banking (m-banking). A total of 247 valid respondents in India were tested against the research model using analysis of variance and structural equation modeling (SEM) approaches. The results of current study recommend that the model was satisfactorily validated by the data. Overall, the model explained 42.8% of the variance in intention to use m-banking system. The findings have also favored gender as key determinants in the TAM. Based on these findings, the theoretical and practical implications are discussed.

Keywords: Technology Acceptance Model (TAM); Gender differences; Mobile Banking (m-banking); m-banking self-efficacy.

I. Introduction

With the rapid development of technology, all aspects of our life has changed, banking sector is no exception. Using information technology (IT), banking sector has been transforming from paper-based record keeping to digitalized record keeping process as part of ongoing efforts to cut down organizational and operational costs, saving time in order to keeping records and most importantly to improve customers' services. IT such as mobile banking (m-banking) is at the forefront of this ongoing transformation. Mobile banking (m-banking) is a technology that has emerged in recent times to enhance the deficits of e-banking and spread out the extent of financial services across all socio-economic clusters and territorial boundaries. M-banking is defined as a provision and availment of banking and financial services with the support of mobile telecommunication devices [1]. The scope of services offered may include facilities to conduct bank and stock market transactions, to administer accounts and to access customized information [2], to verify balances, transfer funds, pay bills, and perform various other transactions [3,4].

Mobile phones have become a significant communication medium for more or less every individual in worldwide. In

recent time mobile phone subscribers far surpass fixed line subscribers in India, due to advanced mobile infrastructure in contrast with fixed line infrastructure, has created environment in which mobile banking becomes more appealing. Several actors such as banks, financial institutions, service providers, operators etc. are involved in providing m-banking services and working in a potential development in m-banking context in India [5]. The banks in India recognize m-banking technology to cut down their operational costs and increase customer base [6]. However, after the introduction of m-banking in India, it showed some great sign of growth. But in India, m-banking is still in its infancy phase, and still has a long way to go because most of customers still prefer banking in the traditional ways [7,8]. Thus, it leaves a great deal of room for advancement and a crucial question raises here is why customers are not adopting mobile banking. In other words, bank authorities must need to recognize the significant determinants which influence on customers' behavioral intention to adopt m-banking in comparison with traditional banking ways in India [9].

Previous studies relating to information systems have explained or predicted users' behavior towards the adoption of m-banking services by seeking theories and models from social psychology, information systems and communication research [10,11,12]. Noticeably among them technology acceptance model (TAM), [13] and innovation diffusion theory [14] are used extensively to sort of end users' adoption behavior. The TAM proposes that perceived usefulness (PU) and perceived ease of use (PEOU) are the main determinants of users' behavioral intentions toward the use of technology. Although the TAM has received considerable support [15,16], it has been critiqued for not being comprehensive enough [17]. Therefore, to achieve its objective, the present study draws on this theory as the theoretical lens to describe the behavior of users towards m-banking services. Moreover, the study seeks out to provide further justification to the TAM constructs and any antecedent to a users' intention to adopt m-banking.

The success of integrating technology in banking environment keenly depends upon the engagement of both users and banking authorities. Having users who are capable of using and managing banking technology is

essential. Users are expected to be on the forefront of the banking reform. Fundamentally, the groundwork should be laid at user provider's level. However, increasing number of studies are recommending the significance of understanding relating to the levels of technology acceptance among individuals, because it is that the key determinant regarding the acceptance of the future. Thus, it is crucial to confirm that individuals are comfortable and capable to use the integrated information communication technology (ICT) into their banking behaviors.

Examining users' intention to use technology in their banking behaviors is yet another area in which gender may manifest itself. However, typically it has been neglected relating to banking technology acceptance studies. Having that, current study goes one step further to understand the moderating effect of gender on the relationship between the determinants and behavioral intention. Over decades even though several studies have examined the role of gender in different perspectives, but only limited studies have integrated gender as moderator in evaluating the relationships between self-efficacy, PEOU, PU, and attitudes towards the intention to use in m-banking perspective. Chu [18] pointed out that gender differences regarding the use of the technology have to be carefully examined, instead of simply demonstrating differences. Understanding gender differences in the significance of the path coefficients might bring additional perception into conventional theories concerning gender issues. Additionally, the significance of gender differences could be different across cultures [19]. A preliminary literature reviewed has displayed that providing further comprehensive information about users' opinion between gender differences is increasingly important for users and banking authorities. By considering better gender differences in users' attitudes towards m-banking system, banking authorities will understand how to motivate and increase accepting intention of users against gender. This suggests that effort should be made to study gender differences in m-banking perspective.

For banking authorities, although ICTs have become inevitable in banking environment, however there is growing indication of less than projected output due to poor user technology acceptance [20]. In other words, identifying the determinants that have an influence on individuals' intentions to use m-banking technology is important to banking authorities having the ability to optimize development policies. Meanwhile, TAM [13] is one amongst the foremost used models for determining an individual's acceptance of technology and several researches in banking perspective have examined the individuals' acceptance of banking information systems on the basis of TAM or extended TAM. Thus, this study also used TAM integrating the determinant "m-banking self-efficacy" as a theoretical basis. Premised on the above mentioned condition, this study proposes the extended TAM model, with gender and m-banking self-efficacy as external variables, to explore gender differences in perceptions and relationships among determinants effecting on m-banking acceptance. We consider that the findings of this study can contribute academicians and practitioners to

understand better way how gender and m-banking self-efficacy effect on users' attitude towards acceptance of m-banking, predicting how users will make reply to it, and so using it.

II. Literature Review

1. Technology Acceptance Model (TAM)

TAM proposed by Davis [21], has been a widely referred model for predicting and explaining user behavior and IT usage and has been considered an intense framework to investigate how users develop attitudes towards the adoption and utilize a technology [13,22,23]. TAM has been the instrument in many empirical studies and it has been found that its ability to clear up intention and attitude towards using IT is better than Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) [24]. Hernandez et al. [25] verified that TAM can precisely describe the acceptance level of a technology in the business perspective as long as the application and subject proposed are correct. Although TAM primarily focused on IS used in the workplace [23,26], the theory is applicable and is being successfully adopted to the study of an extensive sort of end users [26]. King and He [27] carried out a meta-analysis on TAM and found 88 published studies confirm the validation of TAM.

Previous researches advocated that TAM model should be extended by including additional variables in order to improve its specificity and explanatory power [23]. However, several studies have investigated the impact of external variables in TAM model in different perspective, for example social influence [28], perceived enjoyment [29], computer anxiety [30,31], self-efficacy [28], to shed light on the users' intention to accept technology. Besides, Venkatesh and Morris [26] recommended that self-efficacy or computer self-efficacy could be combined with TAM model as a defining factor to validate the acceptance behavior of individuals.

2. M-Banking self-efficacy

From the literature, it showed that numerous technology acceptance studies have emphasized the significance of self-efficacy, in explaining the influence toward the attitude and behavioral intention among users in different context [30,32]. But, those findings are not directly related to users' m-banking self-efficacy. Thus, they are insufficient to contribute considerably in the field of m-banking perspective in Indian. However, this study has moved a step further to deal with a particular systematic self-efficacy topic; namely, the effect of m-banking self-efficacy on users' intention to use m-banking. However, m-banking self-efficacy is defined as an evaluation of users' proficiency to learn with m-banking system and their individual confidence in using m-banking system as an effective tool to improve their banking behavior.

3. Gender roles in the technology acceptance model

Riquelme and Rios [33] investigated the impact of gender regarding m-banking adoption using the current users of e-banking in Singapore and findings revealed that PEOU and subjective norm (SN) have a greater impact for women whereas the relative advantage is more significant for men on intention to adopt m-banking services. Gefen and Straub

[19], examined the perception and intention to use of e-mail employing an extended TAM Model, and they reported that women and men were different in their perceptions regarding social presence, usefulness, and ease of use however not within the use of e-mail. But, their findings were based on direct effect of gender on the four dominant determinants but however not on how role of gender moderated the effect on the use of e-mail. Venkatesh and Morris [26] studied the moderating effect of gender relating to usage of software using extended TAM model. Their findings recommend that men take into account that PU as a significant determinant in determining to use software whereas women consider PEOU as the key contributing factor in reaching out that decision. Hwang [34] studied the moderating effects of gender regarding the factors influence on the adoption of e-commerce system and they found that SN has a greater influence on intention to adopt e-commerce for women whereas perceived enjoyment has a greater influence on intention to adopt e-commerce for men. Nysveen et al. [35] examined the moderating effect of gender on a mobile chat service by incorporating the TRA model with the TAM model and results simply that women consider SN and intrinsic reasons as significant determining factors in their intention to use mobile chat services but ease of use has little influence on their intention to use. According to study by Ong and Lai [36] regarding the gender difference in perceptions and relationships among determinants of e-learning adoption and they found that women were more significantly influenced by the perception of computer self-efficacy and PEOU, as well as men's acceptance decision were more significantly influenced by the perception of PU of e-learning. Amin (2007) took on a similar model like Nysveen [35] in their study regarding intentional use of a SMS mobile banking service. The study findings reported that perceived expressiveness, PEOU and SN are the significant factors for intention to use SMS banking for female students. On the contrary, PU and perceived system quality are the key determining factors for male students. Previous literatures validate that research on gender and banking system adoption theory is a significant characteristic of banking and individuals' behavioral adoption but has not yet been exclusively explored in the context of m-banking system adoption. Thus we recommend examining gender differences with regard to m-banking system adoption using a modified TAM model. By comprehending the role of gender, our aim is to develop appropriate strategies that can improve the adoption rate of m-banking system among Indian.

4. Mobile Banking in India

Mobile banking (m-banking) can be considered as “actions that result in an entity’s right to use to the sort of banking activities (associated with savings or credit) by using mobile devices such as cell phones” [37]. Based on the circumstances, this might also incorporate mobile payments [38]. In developed countries, the keen development of smartphones and other mobile devices has brought about the significant diffusion of mobile banking. According KPMG [39] the total number of mobile banking users

surpasses 0.8 billion globally and is projected to hit 1.8 billion by 2019. During the last few years, mobile banking has generated a deluge in banking industries in developing countries such as India through the escalated use of smartphones [40]. Thus, highest rates of adoption of mobile banking in the world have been seen in India and China [39].

Indian banks have been offering m-banking services since 2009 as a means to give their customers, especially those in rural areas, seamless access to banking services [41]. The main advantage of m-banking is that the people in remote area can also access the banking services at ease. According to KPMG [39] India ranks fifth in the world regarding its rate of adoption of m-banking services that currently surpasses 50%. In recent years, Indian m-banking has reflected a growing trend (even if in low volume). According to report by Reserve Bank of India [42], during 2015-16, the value of transactions through prepaid payment instruments (PPI) cards and mobile-wallets increased to 254 billion Indian Rupees (INR) and 206 billion (INR) respectively, against 105 billion (INR) and 82 billion (INR) respectively in the previous year. But m-banking still has a long way to go as majority of customers prefer banking in the traditional ways [8]. An important question here is why customers are not adopting m-banking as per assessment.

Researchers frequently have been studied about the barriers and drivers of m-banking adoption to improve understanding of why customers do not adopt m-banking [43]. According to RBI [44] report, two potential challenges were identified to attaining m-banking piercing to the predictable level. The first challenge is regarding the enrollment process for example mobile number registration, the m-pin (mobile personal identification number) generation procedure, privacy and security concerns, and training for both bank employees and customers. The second challenge is more regarding technical concerns (access networks for transactions, complicated transaction processes, and does not coordinate between mobile network operators and bank authorities to let customers a composed experience). Additionally, the transaction procedures is unwieldy involves numerous authentication input from customers. Table 1 indicates a review of several barriers of m-banking adoption.

Table 1. Barriers regarding m-banking adoption.

Barriers	Sources
Lack of easy-of-use	43,45,46
Lack of usefulness (traditional banking services)	16,33,45,46
Self-efficacy	47,48,49
Relative advantages	50,51
Lack of knowledge (awareness)	52,53,54
Privacy and Security concerns	54,55,56
Subjective norm	50,57

Though, the investment from government and banking sector in building technological infrastructure has eradicated a number of technological barriers. But, from the Table 1, we can comprehend that difficulty to use; usefulness and users' self-efficacy are among the main barriers to the adoption of m-banking. Nonetheless, barriers such as difficulty to use, usefulness are still persisting. Several studies on online banking adoption [49,58,59] have discussed about significant influence of easiness to use and usefulness of m-banking technology regarding users' acceptance of m-banking. Thus, we can conclude that behavioral characteristics and self-usefulness are significant barriers to the adoption of m-banking.

III. Research Model and Hypothesis

Based on the above literature review, the current study was conducted to investigate the applicability of the TAM in the m-banking context with gender and m-banking self-efficacy as external variables. Figure 1 shows the research framework.

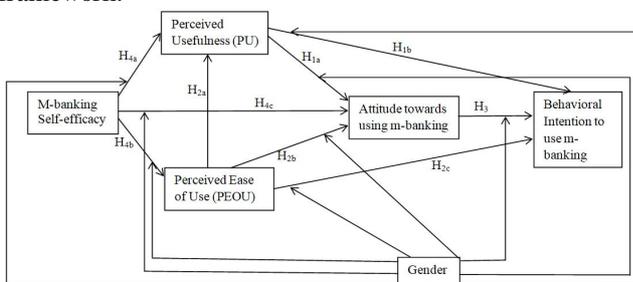


Figure 1. Research Framework.

1. Perceived Usefulness

The findings by Gefen et al. [60] confirmed that TAM models have reported that attitude toward using IT is drawn primarily from the individual's perception of usefulness. Previous researches have indicated that there is a positive relationship between PU and attitude toward using m-banking in addition PU and behavioral intention toward usage of m-banking [21,61,62]. According to study findings of Chau and Lai [63] regarding contributing factors towards the customers' adoption of internet banking concluded that PU was found as a significant factor in developing a positive attitude towards adoption of internet banking services. Alsamydai et al. [64] stated that PU has a positive effect on the attitude, intention and usage of m-banking services. Additionally, PU can directly influence on acceptance intention [65], in spite of whether PEOU directly or indirectly influences on the behavioral intention [66]. So, the following hypotheses were put forth:

- H_{1a} PU significantly and positively influences on users' attitude toward m-banking use.
- H_{1b} PU significantly and positively influences on users' behavioral intention to use m-banking.

2. Perceived Ease of Use

The findings of previous researches confirm inconsistent relationship between PEOU and attitude towards using IT [67,68]. According to study findings by Lee et al. [69] through a systematic review of 58 studies, observed a

significant relationship between PEOU and dependent variables as attitude and behavioral intention to use of IT, also recommended that PEOU is a volatile determinant in predicting dependent variables. Lee and Chang [70] suggested that PEOU is significantly correlated with attitude or intention through PU. However, Igbaria & Iivari [71] perceived no significant relationship between PEOU and attitude of using IS, whereas study by Davis et al. [62] stated that PEOU might indirectly influence the acceptance of IS through PU and PEOU could be a decisive factor in accepting IS. The effect of PEOU on attitude has been presented in numerous studies applied to different contexts [63]. Park et al. [72] observed that PEOU has a positive influence on attitude toward mobile social network games; and according to study by Ha et al. [73] on attitude toward mobile games also displayed same finding. Previous studies have also noticed that PEOU has significant influence on adoption and use of technology [8,62]. According to study findings by Luarn and Lin [16] PEOU was significant in determining intention to adopt m-banking. Thus, the following hypotheses were put forth:

- H_{2a} PEOU significantly and positively influences on users' PU.
- H_{2b} PEOU significantly and positively influences on users' attitude toward m-banking use.
- H_{2c} PEOU significantly and positively influences on users' behavioral intention to use m-banking.

3. Attitude to use m-banking

According to studies by Ajzen [74] the concept of attitude towards behavior seems to play an significant role in predicting and understanding users intention and behavior of using information systems (IS) such as m-banking. Behavioral intention is defined as an individual's personal likelihood to use the system in question. The hypothesis that intention is a consistent analyst of behavior is being supported in both attitudinal research and research regarding technology adoption [10,74]. The influence of attitude towards behavioral intention to use the system has been studied by Amoako-Gyampah and Salam [75], Venkatesh et al. [76] as to be positive. Davis et al. [62] stated that there was a direct relationship between attitude and intention to use IT suggesting that users intending to use IS when they consider it positive. Thus, according to TAM model, we perceive that a user's intentions to use the m-banking system can be explained by their attitude toward using it.

- H₃ Attitude toward using m-banking positively influences on users' behavioral intention to use m-banking.

4. M-banking Self-efficacy

The perceived self-efficacy is the belief that the individual is accomplished of executing a particular behavior [69]. In m-banking context, perceived self-efficacy can be defined as the decision of user's competence to use m-banking. Users are possibly forming a positive intention and accept m-banking when they perceive that they have the ability to use it. Thus, self-efficacy has a positive effect on Perceived usefulness. Hsu et al. [77] did a survey on 207 MBA students from an AACSB accredited University in the

Midwest of the United States of America and findings showed a significant positive relationship between self-efficacy and PU of computer software. In an empirical study, Tan and Teo [78] found that users who have self-confidence in their ability to use the Internet have exhibited significant propensity to adopt Internet banking services. Chau and Ngai [79] emphasized that self-efficacy plays a vital role in forming user's beliefs about using Internet banking services. Empirical research findings by [26,61,71,77] have verified that self-efficacy has a significant positive impact on PEOU. Luarn and Lin [16] and Wang et al. [11] also stated that self-efficacy has the positive impact on PEOU. So, in other words, the more self-efficacy is attained throughout training; the system is perceived to be easier to operate. This furthermore intensifies enthusiasm of learning (PU). However, self-efficacy or computer self-efficacy is being extensively referred in studies regarding IT or IS and the findings have contributed positively toward users' perceptions of system ease of use and usefulness [61,71]. Moreover, Nasri and Charfeddine [80] explored self-efficacy as a factor affecting user's m-banking acceptance behavior in their study and their findings endorse a significant positive relation between an user's self-efficacy and their attitudinal intentions to adopt m-banking services. Thus, based on the above observations the following hypotheses were put forth.

H_{4a}: M-banking self-efficacy positively influences on users' PU.

H_{4b}: M-banking self-efficacy positively influences on users' PEOU.

H_{4c}: M-banking self-efficacy positively influences on users' attitude toward using m-banking.

5. Gender

McDonald and Siegal [81] stated that self-efficacy regarding technology use is the perception refers to users' beliefs in a broader selection of contexts about their ability to cope with different situations and various challenging environments while dealing with a technology related function. Several researches examined whether and how, gender influences on self-efficacy in the context of IT. Some study indicated that men seemed to be more self-assured and well-informed in using technology-related services [82]. On the other hand, some other study found no gender differences in the context of technology use [83], or although less common, even findings are contrary [83,84]. Cooper and Lucas [85] considered that gender difference in self-efficacy could be caused from differences of individual's psychological states, behaviors and motivation. In the context of using m-banking system, gender and user's self-efficacy might be related, on the basis of user's perception of his or her own capabilities as associated with a particular function. Kekkonen-Moneta and Moneta [86] subjected that the practice of technology in learning is a commanding deed for male students who thus have more positive attitudes towards learning with technology than female students. Vekiri and Chronaki [87] also recommended that female students' lacking positive perceptions and less attentiveness in technology lead to a

less propensity for them to develop technology competence than male students.

Previous studies of technology acceptance research in the context of learning have explored that the gender differences in perceived of usefulness of IT and emphasize that male learners evaluated IT as more useful than female learners [88,89]. Venkatesh and Morris [90] showed that men evaluate PU to a better level than women in taking their decisions considering usefulness related factors of a new technology and that men are more motivated by influential factors than women. Users learning through IT are like learners learning in institutes, implying that men's rating of PU is higher than women's. Conversely, users generally believed that better practice will reward them in a way of preparing advance against any unintended catastrophe. In other words, m-banking system with a greater extent of PU is one for which a user considers that there is a positive user-performance relationship.

According to study findings by Harrison and Rainer [91] regarding the relationship between gender and computer skills, men associate with better computer skills, whereas women recorded had a greater level of computer anxiety. Since it has been recorded that women typically experience greater extent of anxiety in using IT compared to men [92], and that greater level of anxiety among women could be expected to lead to lowering the ease of use perceptions [90]. Furthermore, men's comparative tendency to sense more at ease with IT has been displayed in IS literature by Gefen and Straub [19], who recorded that men perceived more ease of use of e-mail than women. Additionally, Moon and Kim [93] in the context of IT, indicated that easier to use will be less menacing to the individual and have also found that females display less ease of use in IT, which is considered to be one of the most important barriers for technological development. The findings let us suggesting that men will intend PEOU of m-banking more positively than women.

Broos [94] conducted an extensive quantitative analysis of previous studies regarding the influence of gender on information communication technology (ICT) attitudes and reported; overall, women had more negative attitudes toward ICT than men did. Study by Houtzand Gupta [95] informed significant gender differences support men had more significant attitude toward new technology, such as the extent of computer use. Another study findings by Whitely [96] also reported in the same line that men are more experienced with and have more positive attitudes about computers than do women. These findings suggest that men are more willing to use IT than women.

Sainz and Lopez-Saez [97] investigated gender differences regarding the preference of technology-related professions and the computer attitudes in Spain and the findings exhibited that female students showed less intention to use the technology and computers than their male counterparts. Venkatesh and Morris [90] examined the gender differences in the relative effect of attitude towards using technology, subjective norms and perceived behavioral control in deciding individual adoption. The findings reveal that the decisions of men were intensely influenced by attitude towards using technology when compared to

judgements of women. Furthermore, Reda and Dennis [98] examined gender-based attitude toward using computer assisted learning (CAL) among university students and the findings indicated that male students preferred of using CAL considerably than female students. Thus, the following hypotheses are generated, giving the research model in Figure 1:

- H_{5a} M-banking self-efficacy influences perceived usefulness more strongly for men than for women.
- H_{5b} M-banking self-efficacy influences perceived ease of use more strongly for men than for women.
- H_{5c} M-banking self-efficacy influences attitude toward using m-banking more strongly for men than for women.
- H_{6a} Perceived usefulness influences attitude toward using m-banking more strongly for men than for women.
- H_{6b} Perceived usefulness influences behavioral intention to use m-banking more strongly for men than for women.
- H_{7a} Perceived ease of use influences attitude toward using m-banking more strongly for men than for women.
- H_{7b} Perceived ease of use influences behavioral intention to use m-banking more strongly for men than for women.
- H₈ Attitude toward using m-banking influences behavioral intention to use m-banking more strongly for men than for women.

IV. Materials and Methods

1. Questionnaires

A preliminary list of measurement items was initially developed after reviewing the literature regarding TAM, role of gender, self-efficacy and m-banking [13,32,34,36,58,76]. This procedure generated 17 items. Additionally, we presented our study description such as what is m-banking and how m-banking works in general, and for what kind of purposes it can be useful. This approach was chosen to overcome any lack of familiarity and to form a reasonable opinion about m-banking system that could have kept on among our participants by reasons of its continuous technological innovation.

Then, these items were presented to seven experts, that is, two professors from Institute of Information Management (IM), three doctoral scholars in the IM field and two senior employees working in the bank and have more than 5 years of experience, to see if any further items could be identified and whether items were likely to be appropriate for the purpose of TAM, m-banking self-efficacy and m-banking system. This procedure resulted in five further items being added to the list of measurements. Thus, twentytwo items in the measurements were selected through these procedures.

In addition, a pretest was conducted using two groups of 15 people each, totaling 30 people. One group was consisted of those who have an experienced of using m-banking system, taken from a broader pool of Indian who participated in-person interview. The second group featured those who have experienced working either in banking sector or financial sector. Based on the pretest result, a factor analysis was conducted [99]. Four items were eliminated because they featured inappropriate wording or they failed to exhibit dimensionality or inter-correlation validity. Some items that appeared confusing were reworded for clarity. This procedure further refined the

measurement items, resulting in a final list of 18: PEOU (4 items), PU (4 items), ATT (4 items), BINT (3 items) and m-banking self-efficacy (3 items).

The purpose of the data collections was to reach as diverse sample as possible that would closely follow the representation of the demographic categories of the general adult individuals and specifically constructed to be representative of the Indian population. For that purpose, individuals were approached in various settings, including neighborhoods, small business, public meeting places such as parks and transportation stations. The individuals were asked to participate completely voluntary and if they wished, a preaddressed and prepaid envelope was given to them, so they can fill in and return the survey by mail at a later time. A total of 332 questionnaires are given out using direct procedure, in which 262 respondents replied back.

The instrument used for this study included three sections. In the first section (cover page), the purpose of the study, and a definition of m-banking was provided. The second section regarded respondents' basic information, including their age, gender, and educational level. The third section contained indicators regarding TAM and m-banking self-efficacy (18 items). The respondents were instructed to use a seven-point Likert scale to evaluate each item (1 for strongly disagree and 7 for strongly agree). To enhance the reliability and validity of the indicators, this study modified the content of the items regarding TAM and m-banking self-efficacy. Table 2 shows the items represent all the constructs of the study and their sources.

Table 2. Indicators for TAM and m-banking self-efficacy.

Dimension		Items	Sources
Perceived Usefulness (PU)	PU1	Using m-banking, I can improve my banking behavior.	Munoz-Leiva et al. [58]; Davis [13];
	PU2	Using m-banking, I can make my banking behavior more convenient.	
	PU3	Using m-banking would be useful in keeping record regarding my banking behavior.	
	PU4	Overall, I find m-banking is useful.	
Perceived ease of use (PEOU)	PEOU1	Learning to operate m-banking will be easy for me.	Munoz-Leiva et al. [58]; Davis [13]
	PEOU2	I can easily become skillful at using m-banking.	
	PEOU3	I can get m-banking to do what I want to do.	
	PEOU4	Overall, I think using m-banking is very easy to use.	
Attitude toward	ATT1	Using m-banking is a good idea.	Munoz-Leiva et al.

using m-banking (ATT)	ATT2	Using m-banking is pleasant.	[58]
	ATT3	Using m-banking is beneficial.	
	ATT4	Overall, I like the idea of using m-banking.	
Behavioral Intention to use m-banking (BINT)	BINT1	I intend to use m-banking in the near future.	Venkatesh et al. [76]; Munoz-Leiva et al. [58]
	BINT2	I plan to use m-banking frequently.	
	BINT3	My willingness to use m-banking is high.	
M-banking Self-efficacy (MBSE)	MBSE1	It is easy for me to use m-banking.	Ong and Lai, [36]; Rahman et al. [32]
	MBSE2	I have the capability to use m-banking.	
	MBSE3	I am able to use m-banking without much effort.	

V. RESULTS

1. Profile of Sample

This study collected 262 responses. Of which fifteen were considered unusable, because of incomplete responses. Thus, we included 247 valid responses for final analysis. The demographic information of the survey respondents is shown in Table 3. The results in Table 3 pointed out that the respondents are differed correspondingly in gender, age, educational level. To give an indication of the representativeness of our sample, we compared it with a nationwide sample. According to National Statistics of India [100], the population ratios between men and women are 51.50% and 48.50% respectively. However, the population of our sample coincides with the national statistics (54.25% and 45.75%) respectively, indicating that the sample is unbalanced in terms of gender.

Table 3. Profile of survey respondents.

Item	Option	Count	Percentage %
Gender	Male	134	54.25%
	Female	113	45.75%
Age	20-29	62	25.10%
	30-39	95	38.46%
	40-49	54	21.87%
	50-59	23	9.31%
	>=60	13	5.26%
Education Level	High School or under	24	9.72%
	College	153	61.94%
	Master or above	70	28.34%

2. Data Analysis

A descriptive analysis was performed on MBSE, PU, PEOU, ATT and BINT. Mean and standard deviation values of all the constructs are presented in Table 4. Mean scores of all the constructs are above the midpoint of 3.5,

ranging from 3.74 to 4.76. It implies an overall confirmatory reply to the constructs of the study. The values of standard deviation (SD) recommend a reasonable distribution around the mean.

3. Instrument reliability

The validation of the measurement model is estimated on the criteria of reliability, convergent validity and discriminant validity. Reliability was tested using the composite reliability and the Cronbach alpha values. A Composite Reliability (CR) value of 0.7 or higher suggests good reliability by Hair et al. [99]. Table 4 shows that all of the CR values for the latent factors in this model are above 0.7 and all of the Cronbach's α value (Table 4) are above the recommended value of 0.7 Hair et al. [99]. Thus, we can conclude that the reliability of this model is validated.

Table 4. Descriptive statistics of the study dimensions.

Dimension	Mean	S.D.	Composite Reliability
MBSE	4.52	.93	0.92
PU	4.27	.92	0.87
PEOU	4.16	.87	0.85
ATT	3.74	.83	0.93
BINT	4.76	.91	0.91

4. Evaluation of the measurement model

A confirmatory factor analysis (CFA) was conducted using AMOS statistical software to investigate the measurement model and the results are shown in Table 5. All the value of standardized regression weights are above .70 and ranging from .854 to .952 (Table 5). According to Hair et al. [99] the value .50 or greater for multiple square correlations (R^2) is considered applicable. The value of all items in this study are ranging from .681 to .891 (Table 5), implying that these items were interpreted by their predictors, ranging from 68% to 89%.

Table 5. Results of factor analysis.

	Item	Factor loading	SE	t-value	R^2
MBSE	MBSE1	0.872	0.932	23.879	0.869
	MBSE2	0.843	0.917	-	0.841
	MBSE3	0.817	0.873	23.524	0.823
PU	PU1	0.886	0.952	-	0.762
	PU2	0.821	0.919	20.421	0.823
	PU3	0.842	0.921	16.451	0.681
	PU4	0.864	0.914	17.152	0.761
PEOU	PEOU1	0.892	0.872	-	0.882
	PEOU2	0.871	0.923	37.354	0.831
	PEOU3	0.796	0.913	36.461	0.827
	PEOU4	0.847	0.863	38.235	0.862
ATT	ATT1	0.873	0.934	19.241	0.835
	ATT2	0.881	0.921	17.343	0.834
	ATT3	0.826	0.854	15.235	0.891
	ATT4	0.881	0.861	-	0.871
BINT	BINT1	0.861	0.938	19.786	0.883
	BINT2	0.861	0.929	18.656	0.872
	BINT3	0.814	0.882	-	0.886

Note: SE: Standard estimate

t-value (critical ratio) indicates whether the variable is significant at the 0.05 level.

- This value was fixed at 1.00 for model identification purposes

The convergent validity of the scales is examined by using two criteria, suggested by Fornell and Larcker[101], that is, loadings of all indicators should be higher than 0.7 and Average variance extracted (AVE) of each construct should be exceeded the variance due to the measurement error of that construct (i.e. AVE should be exceeded 0.50).

As shown in Table 5, all the items have presented loading higher than 0.7. So, it offers satisfactory evidence to accept the convergence of items on the proposed constructs. Additionally, the AVE values of all the constructs are well above the cut off value of 0.5 (Table 4). Therefore, both conditions for convergent validity are met.

The Discriminant validity was measured by the correlations among the constructs and the square root of the AVEs, also suggested by Fornell and Larcker[101]. Table 6 shows the square root of AVE for each construct (the diagonal elements) was greater than the correlation values of the construct with other constructs, providing the discriminant validity of constructs. Thus, we conclude that the scales must have sufficient construct validity.

Table 6. Average variance extracted and Discriminant validity.

	MBS E	PU	PEOU	ATT	BIN T	AV E
MBS E	0.91					0.83
PU	0.42*	0.87				0.76
PEOU	0.51*	0.54*	0.88			0.78
ATT	0.45*	0.52*	0.56*	0.86		0.74
BINT	0.52*	0.57*	0.43*	0.65*	0.89	0.80

NOTE. Diagonal in Bold: square root of average variance extracted (AVE) from observed items;

Off-diagonal: correlations between constructs. * $p < 0.05$; ** $p < 0.01$

All goodness-of-fit indexes are summarized in Table 7 with regard to check the model fit of the measurement model. As shown in Table 7, all values are above the recommended values for acceptable model fit and it validates that the measurement model has shown a good model fit.

Table 7. Goodness-of-fit measures of the research model.

Goodness-of-fit measure	Recommended value (a)	Model Value
$\chi^2/\text{degree of freedom}$	≤ 3.00	2.27
Goodness-of-fit index (GFI)	≥ 0.90	0.95
Adjusted goodness-of-fit index (AGFI)	≥ 0.80	0.84
Normed fit index (NFI)	≥ 0.90	0.93
Non-normed fit index (NNFI)	≥ 0.90	0.92
Comparative fit index (CFI)	≥ 0.90	0.94

Root mean square residual (RMSR)	≤ 0.10	0.07
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Note: a: Hair et al., (2010), MacCallum et al. (1996), and Ping (2004).

Hypotheses testing

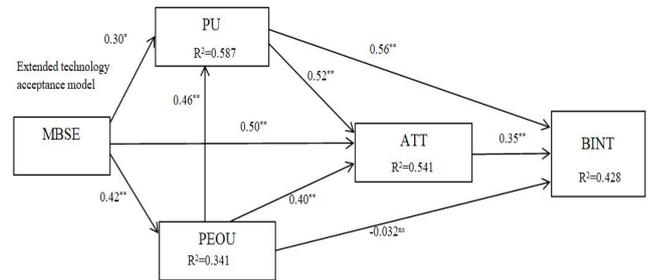


Figure 2. SEM analysis of research framework.

Note. * Significant at $p < 0.05$ level, ** Significant at $p < 0.01$ level, ns not significant at $p < 0.05$ level.

The results of the standardized structural path analysis are shown in Figure 2. The results provide support for the proposed significant relationships between the eight relationships (i.e., H1a, H1b, H2a, H2b, H3, H4a, H4b and H4c) while the remaining one relationship (i.e., H2c) is not significant at the 0.05 level of significance. M-banking self-efficacy, PU and PEOU have reported 54.1% ($R^2=0.541$) of the variance in attitude toward using m-banking. Perceived usefulness was significantly reported by m-banking self-efficacy and PEOU resulting in variance explained was 58.7% ($R^2=0.587$). PEOU was significantly reported by m-banking self-efficacy, resulting in variance explained was 34.1% ($R^2=0.341$). Overall, the model explained 42.8% of the variance in behavioral intention to use m-banking.

5. Measurement of total, direct and indirect effects

To evaluate confidence intervals for the indirect effect, a bootstrapping test was performed. Table 8 indicates the standardized total, direct and indirect effects related to each of the endogenous and exogenous variables toward behavioral intention to use m-banking. In line with MacKinnon [102], standardized path coefficients with values close to 1 are measured to be greater values influence. The most dominant factor of behavioral intention is PU, with a total impact of 0.698 and is followed by MBSE, ATT and PEOU with an outcome of 0.397, 0.352, and 0.155 respectively. Jointly, these four factors explain nearly 42.8% of the variance in behavioral intention to use m-banking. Moreover, m-banking self-efficacy functioned as a significant factor for all endogenous variables in the model.

Table 8. Direct, indirect and total effects of MBSE, PU, PEOU, ATT and BINT.

Predictor Variable	Outcome Variable	Standardized estimates			
		R ²	Direct	Indirect	Total
MBSE	PU	0.58	0.301	0.278	0.579*
PEOU	PU	0.341	0.462	-	0.462*

MBSE	PEOU	0.341	0.424	-	0.424**
MBSE	ATT	0.541	0.501	0.117	0.618*
PU	ATT		0.521	-	0.521**
PEOU	ATT		0.404	0.223	0.627*
MBSE	BINT	0.428	-	0.397	0.397*
PU	BINT		0.561	0.137	0.698*
PEOU	BINT		-	0.187	0.155
ATT	BINT		0.032	-	0.352**

Note. *p<0.05; **p< 0.01

We carried out a two-group test for investigating the gender differences in strength of the path coefficient. On this evaluation, one path coefficient turned into confined to be same across the two gender groups, and the resulting model suit was compared with a base model, wherein all path coefficients were freely expected the usage of a χ^2 difference test. The results of the gender difference analysis are shown in Table 9 and Figure 3. The paths from MBSE → PU, MBSE → PEOU, MBSE → ATT, PU → BINT, PEOU → ATT and ATT → BINT were found to be significantly different. In other words, Hypotheses 5_a, 5_b, 5_c, 6_b, 7_a and 8 were supported. Therefore, the path coefficient from PU → ATT and PEOU → BINT were not found difference between two groups. Thus, hypothesis 6_a and 7_b were not supported.

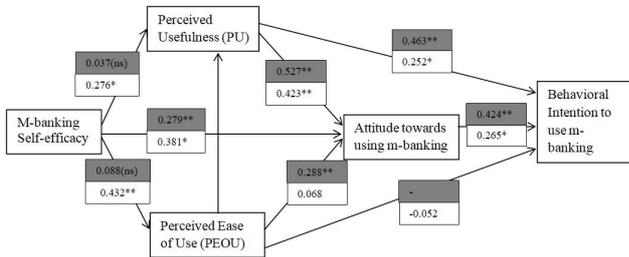


Figure 3. Standardized path coefficients for the male and female users

Coefficients for male users are in the shaded boxes. *p < 0.05; **p < 0.01; ns= not significant.

Table 9. Two group comparison of paths for men and women users.

		χ^2	df	$\Delta\chi^2$ from base model
Unconstrained model ^a	base	271.148	142	
Constrained paths ^b	MBSE → PU	283.219		8.632**
	MBSE → PEOU	283.035		8.476**
	MBSE → ATT	287.181		11.262**
	PU → ATT	287.162		0.174(ns)

PU → BINT	271.322		13.746**
PEOU → ATT	276.267		9.621**
PEOU → BINT	271.236		0.072(ns)
ATT → BINT	271.292		7.608**

NOTE. ^aPaths for the two groups were allowed to be freely estimated.

^bThe path specified was constrained to be equal across the two groups.

* p < 0.05; ** p < 0.01; ns= not significant.

VI. Discussion

The findings of this study empirically validated the TAM in an m-banking perspective by going a step further to find out the role of gender and m-banking self-efficacy as external variables. The research findings offer several significant implications from academic and practical point of view regarding the adoption of m-banking system. Largely, the model explained 42.8% of the variance in intention to use m-banking system among Indian. According to the findings of goodness-of-fit measurement, this study headed to the conclusion that research model perfectly speak for the collected data and the factor suitably, toward individuals' intention to m-banking use. The findings among the research constructs are discussed below.

First, there was a significant positive correlation between PU and attitudes toward using m-banking, in addition PU and behavioral intention to m-banking use. It implies that users are likely to develop a positive attitude towards using m-banking system when they find it useful in their banking behavioral practice. If the users believe m-banking system is useful, then they will have a positive attitude towards using the system. Given this, when improving their m-banking system, the bank authorities should especially strengthen system usefulness, so as to attitudes towards their m-banking system and improve adoption. In other words, m-banking system design should primarily seek out to evolve the functions that meet with the users' needs and motivate them to use the system continuously. This finding is line with Taylor and Todd [10] who pointed out that PU has both direct and indirect influences on the attitude towards using the system.

Furthermore, the analytical results of the study reveal that the relationship between bank authorities and users can be enhanced while behavioral intention to m-banking system use and users' reliability towards the practicing system is improved. If users perceive that using system will help and improve them in their banking behavior then they consider using it persistently. In other words, this also can improve the usefulness of users regarding acceptance of banking system services.

Second, Alatawi et al. [103] and Davis et al. [62] indicated that users who perceived information system is as easy to use also perceived it is as useful. Alatawi et al. [103] revealed that the significant relationship between PEOU and PU shows how crucial it is for the system to be

perceived by way of user-friendly and easy to use regarding perceived useful by its users. The findings of current study indicate that the more users perceive m-banking system as being easy to use, the more they feel it is useful. Generally, PU is considered as the development of m-banking processes and quality services along with information provided by bank authorities by means of the functions in an IS. Significantly, users may not experience the inclusive satisfaction of m-banking system without an easy to use interface and to be free from difficulties.

Third, PEOU is positively correlated with attitudes towards using m-banking system, suggesting that PEOU is significantly associated with user's positive attitude toward using m-banking system. In other words, users' consideration to use the m-banking system piles up further as the system turns out to be easy to use. Therefore, PEOU not only predicts attitude towards the m-banking system, but is also a determinant antecedent of PU, that is, minimum effort is applied to use m-banking system to improve users' performance regarding banking activities, directly effects on users' further attitude to use the system.

Fourth, several studies of users' acceptance of technology have presented that PEOU has a direct influence on behavioral intention to use the system. However, the findings of this study could not verify this result. The study findings coincided with previous studies including Alatawi et al. [103] and Sharma and Chandel [104]. It indicates that although user experience that the m-banking system is easy to use but it does not influence on the development of users' behavior regarding the usage of m-banking systems. The functions to operate the m-banking system can be accessed very easily from one option to another. However, easily access the system consent to users to easily remember how to access the function on the next time use. Though, easy to operate may be significantly influence on users' intention to use a system in specific context such as e-commerce [105]. But in banking perspective a financial service providing system is used by users for specific purposes. Users use such kind of systems as they can take care of their financial decision in a better way as well as control their banking behavior from anywhere at any time it is required with a complete trust on banking service providers. Thus, users are mostly concerned about whether the services or contents offered by the system are beneficial to improve their banking behaviors rather than feelings of easiness to operate the system. So, the difficulties with the system's interface or easiness to operate may possibly not be such a significant consideration in m-banking perspective.

In this study, users expected to improve their banking activities through using the m-banking system. So, if, a user perceives that despite the system is ease to use but did not improve their banking activities, then their usage behavior regarding m-banking system is not going to be improved anyhow. Thus, the findings recommend that bank authorities should not place needless importance on appearance of the system while considering the design of the m-banking system; instead of emphasizing on the factors users reasonably expecting from the m-banking system, for example, suitability of the system functions.

Fifth, the findings of the study revealed that attitude towards using m-banking positively correlated with behavioral intention to use m-banking. The findings of current study are consistent with Davis et al. [62]. According to Davis et al. [62] there was a direct relationship between attitude and the use of system indicating that users positively evaluate the system. In other words, if users have positive attitude towards using m-banking system, then users' intention of using m-banking system becomes more. Thus, positive attitude should be considered as a strong determinant when acceptance of financial systems such as m-banking system is concerned.

Sixth, with concerns to certain efficacy factors, it was also verified decisively that m-banking self-efficacy has a significant positive influence on PU, PEOU, and attitude toward using m-banking. Additionally, m-banking self-efficacy has the maximum impact on attitude toward using m-banking, followed by PEOU and PU. Significant point is that m-banking self-efficacy has indirect impacts on attitude toward using and behavioral intention to use the m-banking system. This finding has presented an additional understanding into the implication of m-banking self-efficacy, and set up a new contribution in m-banking context. Due to the significance of m-banking self-efficacy in stimulating higher intentions toward the use of m-banking system among users, banking authorities and policymakers must pay greater interest to improve users' perception and self-confidence in using m-banking system. Banking authorities and policy makers specifically should design the training program and educating the users about new information system (IS) is going to be used from time to time, is a dominant determinant regarding the acceptance behavior of a new financial system as systems are advancing and developing rapidly. This could also serve as a psychological preparedness for users to be prepared towards appropriate information acquisition and effective use of technological system regarding m-banking in near future.

This study additionally examines if there is any gender difference present in the effect of the factors on behavioral intention to use m-banking system. The results reported that gender moderates the effects of $PU \rightarrow BINT$, $PEOU \rightarrow ATT$ and $ATT \rightarrow BINT$. This findings pointed out that regardless of gender, those with greater PU, PEOU and attitude toward using m-banking had greater levels of intention to use m-banking system than those with lower PU, PEOU, and attitude toward using m-banking. This result is in same line with the previous studies which also showed that gender significantly moderate the effects of PU and PEOU towards intention to use technology [19,76]. This may due to the fact that m-banking system has not permeated the everyday lives of users and differences in the usage between men and women have been widened until it could be a significant usage system in users' financial behavior.

Therefore, a significant finding from this study is that the effect of m-banking self-efficacy on PU and PEOU was significant for women, but insignificant for men. Moreover, m-banking self-efficacy influenced attitude toward using m-banking more intensely for women instead of for men. It

signifies that compared to men, women will be more positively influenced by their own potential aptitude to comprehend m-banking system and also by their confidence about using m-banking system as effective learning methods to improve their performance in m-banking activities. This could be due to the recognition that men tend to have better technological self-efficacy, and therefore m-banking self-efficacy does not affect their perceptions regarding usefulness and ease of use of the m-banking system. Though, several studies have observed that women revealed lower self-efficacy regarding technological usage than men [106,107]. The lower self-confidence of women towards the usage of technologies may have significances for their own self-beliefs in the use of new technologies in m-banking context. However, specific informative technological training programs regarding m-banking context should be introduced to allow women improving their own self-confidence, and a self-belief that using m-banking system could improve their performance regarding m-banking behaviors, which in turn improve their overall banking performance. Consequently, this validation needs more investigation and assessment, as larger number of participants is young.

VI. Contributions

In spite of the empirically documented applicability of the TAM, advance attempts are critical to verifying remaining study findings in the TAM literature involving different IS and settings. This study has verified TAM in the context of emerging m-banking system in Indian perspective. The study aims to extend the TAM model's empirical applicability and theoretical validity by investigating determinants influence on Indians' acceptance of m-banking system. The purpose of the study was to make a theoretical and practical contribution to m-banking system acceptance research by advancing the understanding of user's technology acceptance behavior and extending the TAM research including in the new context. Furthermore, understanding determinants and environments facilitating regarding m-banking system acceptance might help to predict future acceptance behavior of other emerging ICTs. In addition, findings from India could be applied to other countries in South East Asia (such as, Pakistan and Bangladesh) by reason of their ethnic similarities.

Second, an important contribution to user technology acceptance study is the use of a primary intention-based model in m-banking system perspective, which is significantly different in functioning independence and individual self-reliance from the business organizations usually considered in prior research. One way, we verified the reasonable extension of the usability of TAM model, on the other way, we further answered back to justify our theory testing effort to endorse research findings accumulated from previous studies on banking technology acceptance, particularly in the context of m-banking system. In principal, findings from the study recommend TAM could be an appropriate model for justifying users' technology acceptance decisions. The model offers a parsimonious conceptual representation of users' technology acceptance decision-making with a rationally

satisfactory empirical support, as measured by the analysis of study results.

Finally, current study efficiently uses TAM to investigate the effect of gender in the perceptions and policymaking processes in banking perspective especially in m-banking system acceptance. This is a new contribution to literature regarding m-banking studies.

VII. Conclusion and Implications

As an emerging system, the success of m-banking in India, in addition to other parts of the world, still depends on many other factors. These factors include government policies, financial infrastructure, strategies taken by banking authorities, coordination of technical standards, and the abilities to protect user's privacy and security.

This study has provided empirical data to support the acceptability of TAM and also provided insights into the relationships between PU, PEOU, attitude toward using m-banking, behavioral intention to accept m-banking and external variables, m-banking self-efficacy and gender regarding emerging banking system, m-banking. The findings of this study provide several important implications regarding acceptance of m-banking technology research and practice. Through the antecedent variables of usefulness of system, ability to use the m-banking and attitudinal intention to use m-banking can better control users' beliefs about using m-banking and then recommend new strategies for improving their usage intention. The results of current study also recommend that researchers studying financial systems must take gender difference into consideration in the improvement and validation of the theories of m-banking system adoption.

1. Theoretical Implication

The model of behavioral intention to use m-banking system represented in this study is supported by the empirical results. The current study endeavors to develop a theoretical research model by applying TAM model integrating new relationships between variables. Study findings offer further confirmation on the acceptability of using TAM to evaluate the different dimensions of acceptance in m-banking environment. Therefore, we can state that the model is applicable for m-banking perspective in India, although the contributing direction of the relationship could be established in better way through longitudinal research.

Current study extends previous work on IS by presenting empirical evidence, and the findings cast off light concerning the positive potential of the TAM theory in intention of users to accept m-banking system. The findings show up those new services must be driven in user centered approach to understand user involvements more closely. This study also stands for how users endeavor to validate their acceptance behavior of new banking information system such as m-banking system in the best possible way and explains the robustness of the model. Furthermore, the findings rationally demonstrate that traditional variables for example PU and attitude towards using persist to be significant predictors of behavioral intention of using m-banking.

Our study results underscore the importance of PU as the main mediator of individual's attitudes toward using m-

banking. In literature, PU has been found to explain a considerable amount of variance of attitude and intention [13,24,62], and that its effect is typically stronger than the effect of perceived ease of use [13,108]. PU in the context of m-banking system has typically been related to financial status, benefits and relevant information provided in the right time and in the right context. Therefore, the findings contribute positively to the m-banking literature regarding users' behavioral intention to accept.

Based on the results, we recommend that in the context of willingness to accept IS among users, users' consideration regarding usefulness and perception of easiness to use satisfactorily validate the development of attitudes and usefulness further influence on the usage intentions towards self-management banking technology. Additionally, researchers could discover that TAM as a framework for investigating the acceptance of m-banking system in an adoption co-produced based service perspective is the most applicable. We conclude this is as a verification of the robustness of the underlying theory.

Users apparently have a tendency to be logical in their IS acceptance decisions, regarding to focus on usefulness in IS consideration. That is to say that a user is prospectively to accept a IS when it is considered to be useful to him or her practice. However, PU is an important defining factor of attitude, exhibiting incredible effects on users' attitude formation. This finding is consistent with the findings of previous studies in the perspective of TAM. For example, Keil et al. [109] concluded that usefulness is more determining factor whether to use or not to use a IS than ease of use. In our study perspective, an indispensable factor for users' acceptance of m-banking system is whether the system satisfies his or her service requirements. The perceived significant role of PU on users' attitude building could also have been partly implanted in individuals' self-executive assessment of technology of system and is accepted only when showing favorite usefulness in their performances.

Attitude seemed to be the second most significant determinant of an individuals' intention for accepting m-banking system. This emphasizes the analytical role of attitude in system acceptance decision making by individuals and thus singles out the significance of attitude nurturing to successful implementation of system. The findings recommend additional support that attitude of users' behavior is a significant determinant in user' behavioral intention to use m-banking system. By validating the findings of a previous IS acceptance study current study recommend additional support that the well-acquainted m-banking system acceptance model may need to be designed to benefit banking information systems.

From a gender differences perspective, our results confirm relationship between PU and behavioral intentions to be stronger for men than women, as men enjoying using m-banking system as an opportunity to extend their IS skills as well as perceived to receive the better outcomes regarding banking behaviors, while women generally seek to keep time spent to a minimum because of their theoretical barrier towards using IS. The results confirm our

perception that men respond more positively to direct use of IS regarding banking behavior than women.

The findings regarding the role of gender are also important regarding the design of the program for user's development related to m-banking usage. Considering user's training as a kind of solution for individual especially women's lack of interest towards the acceptance of new IS in banking sector is still unified and one-off. Thus, without a continuous supportive training, the problem of lack of acceptance would still be a significant barrier to the successful use of IS in banking perspective.

2. Practical Implication

A significant implication of this study is the strategic planning value in investigating the determinants which influence on acceptance of m-banking by users. Bank authorities invest huge amount of money on newly introduced information technology (IT) and information system (IS) to provide more improved service to customer. But, many of these technologies are not enthusiastically accepted by the users. Thus, bank authorities should investigate which determinants are playing positive role toward adopting emerging technologies or systems for user.

Bank authorities can apply the framework to predict users' willingness to accept and use the system, diagnose the reasons for low acceptance of system, and take correct initiative. The key point is users' attitude towards using the system. If users have more positive attitude, they are more likely to accept and use m-banking system. The framework also offers insights on how to achieve this: a more positive attitude can be achieved by enhancing m-banking system's compatibility with the user's needs, value, and expediency. Users make inferences about the services received based on the information provided by bank authorities. The quality and usefulness of the provided information is determined by the degree to which users can perceive the information to predict their satisfaction with the system compared to actual use: users' choice of accepting m-banking system will greatly depend on bank authorities' ability to provide rich and timely information.

Bank authorities may be able to enhance users' ease to use of system by providing training; for example, a virtual tour of the m-banking system usage that aims at raising users' technical self-efficiency relating with m-banking system. To intensify the objective usability of them-banking system, developers of m-banking application must need to conduct extensive usability tests. While the classic m-banking technical design principles are valid, the new technological media has provided developers new challenges. M-banking application with easy navigation and convenient checkout has been consistently found to attract new user to use the system and improve their usability.

The findings of this study reveal that, in order to nurture users' intentions to use a system, it is considerable to boost up and encourage a positive attitude toward the using of the system. In this correlation, positive perception regarding usefulness of the system is more important than the easiness to use the system. This could be explained that the banking authorities, upon decision to adopt m-banking, must strongly emphasize developing efficient approaches to

communicate about the financial efficiency of the system to users. Information materials and training on m-bankingsystem should be concentrated mainly on how the system can help to improve the efficiency and effectiveness of providing services and users' self-judgment rather than on the technical jargons regarding how actually m-banking system works. In other words information resources must emphasize on expected usefulness and convenience of carrying out self-judgment.

Conceivably learning instructions could be developed to lead conveniences through the implementation method and minimize resistance to change. The current study findings empirically validate the factors influence on users regarding newly initiated bankingtechnology and might prove particularly cost-effective for bank authorities.As the ICTs literature pointed out, gender differences demonstrate that, to some extent, men and women perceive and value similar system quite differently. Bank authorities who are well-informed of this difference can better support the IS with individual's behavioral principles; a relationship that might support to develop IS implementation in bankingcontext successfully [110]. Additionally, to the extent that gender has an attitudinal effect toward using a bankingIS, bank authorities also need to look into the fact that how to create a more favorable atmosphere, one that not only depends on organizational and legislative perpetual factors, but also on the gender of its individuals. Such a consideration could have not only an influence on actual implementation of the m-banking system, but also, could be a deciding determinant on directional training and implementation programs regarding m-banking system.

M-banking self-efficacy is a salient factor affecting PU,PEOU and attitude toward using m-banking.Bank authorities and system developers can increase users' especially women's usage intentions through m-banking self-efficacy and the mediating variables recommended in this research. In m-bankingsystem context, bank authorities can organize training program to improve users' familiarity with m-bankingsystem to let users gradually improve their level of m-banking self-efficacy, a method which can also be efficient for both genders. Though these processes are not directly associated with m-banking itself, but it could be still helpful for the users to improve positive perceptions more easily towards the usefulness and ease of use of m-banking system.

VIII. Limitation and Future Research

Even though a comprehensive research framework design, instrument developed, sample recruited, and data analysis were applied here, this study has some limitations. First, the measures of constructs of current study are collected at the same point of time. Thus, users' perceptions and intention to use m-banking system might change over time as a continuous process by reason of better experience and development of mobile technologies for the time being. So, it is suggested to conduct a longitudinal research to study the m-banking adoption at different points of time during the decision of adoption process. Second, examining the role of gender in the acceptance of m-banking system is a relatively new topic for banking technology researchers.

Therefore, cautionary should be taken while generalizing our study results and discussion with other banking technologies or groups. Thus, a cross-cultural evaluation with a different sample collected from somewhere else is necessary for further generalization of current study findings.

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