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RESEARCH PAPER

Use of Mobile Banking Apps in Pakistan: Extending UTAUT2 Framework with Trust and Innovativeness

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ABSTRACT

This study purpose is to identify the factors influencing users' intention of using m-banking apps in Pakistan. A questionnaire was established using available scales from literature. 508 responses were received using snowball sampling, and a total of 434 survey were considered valid. Significant predictors of m-banking app behavior intention included social influence, innovativeness, hedonic motivation, performance expectancy, habit, and trust were found significant predictors of m-banking apps adoption, except for effort expectancy and facilitating conditions, which have insignificant impact on behavior intention. Usage behavior was fundamentally mediated by usage intention. The study gives marketers, banks and app developers' vital cues on user expectations from the apps. This is one of the few studies to examine the adoption of m-banking apps in an emerging economy context by using extended UTAUT2 model with two exogenous constructs.

| **KEYWORDS** | Behavior Intention, Mobile Banking Apps, Pakistan, Use Intention, UTAUT2 |

Introduction

Mobile technologies advancements have produced intense modifications and the major driver leading towards an increase in the use of mobile banking (Zhang, Weng, & Zhu, 2018). Banks or financial institutions deliver m-banking, which is an application of m-commerce, to allow users to perform countless financial transactions mainly through smartphone (Al-Jabri & Sohail, 2012). A smartphone would enable users to do banking transactions without physical presence, therefore, m-banking allow users to connect with the whole world at any time, and this has changed the ways of using banking services (Aboelmaged & Gebba, 2013). Several banks have embedded technology in their offers by investing in developing interactive websites, and mobile apps (Souiden et al., 2021). Prior studies focused on e-banking, however, with little attention on the usage and adoption of m-banking (Chawla and Joshi, 2017). Extant literature highlighted the external factors that influence m-banking ignoring behavioral reasons that impact user mobile behavior intention (Goswami, 2017; Yu, 2012)

Mobile phone apps have supported businesses in sustaining consumer relationships (Islam et al., 2020). M-banking app is a versatile advanced mobile application that allows consumers to conduct banking transactions using users' smartphones. Prior research has shown that mobile apps have a positive impact on customer service and satisfaction (Verıssimo, 2016). However, it is unclear which factors influence customers' adoption of the m-banking app, which requires further examination, particularly in Pakistan. The study attempts to bridge that gap by examining the factors that lead to customer intent to use the m-banking app, which then leads to actual use of the m-banking app.

Prior research claimed that smartphone penetration in the general public is the major element in the usage of m-banking apps (Sharma and Sharma, 2019). Pakistan Telecommunication Authority (PTA) reported that 193 million people are using mobile phones in 2023. The report suggests that Pakistan is among the leading smartphone users in terms of the population. However, the number of registered m-banking users is only 8.4 million in Pakistan during FY 2022. Moreover, Dawn reported that not a single m-banking

app fall among the top apps downloads in Pakistan during FY 2022, even in finance category. These figures indicate that consumers are reluctant towards m-banking app adoption in Pakistan. Therefore, the current study objective is to investigate the factors behind consumer m-banking app adoption intention (BI) and actual usage (UI), to offer recommendations to help increase the rate of m-banking usage and adoption in the country. Moreover, m-banking today is still at its initial stages of adoption, thus the concept needs more examination, especially within developing countries that have been slow to accept such advances (Laukkanen, 2007). A variety of factors influence whether or not to accept and use an application (Ali et al., 2022). Technical requirements, user education, new competing technological products, security concerns regarding the m-banking app and synchronization are considered barriers for banks (Sharma and Sharma, 2019), limited network coverage and little knowhow about consumer behavior are the challenges being faced by Pakistan (Saleem et al., 2022).

Moreover, m-banking research is fragmented and based on different theoretical frameworks (Shaikh and Karjaluoto, 2015). Many theories and models have been devised to understand individual behavioral intention with regard to technology adoption and usage (Venkatesh et al., 2003, 2012). A large number of studies related to m-banking adoption have utilized TAM theory, thus suggesting to utilize other theories to cover any possible knowledge gaps (Tam and Oliveira, 2017). Furthermore, few UTAUT2 studies attempted to expand the theory itself to further enhance its accuracy (Farah et al., 2018). In addition, most studies solely assess m-banking adoption intention; so Koksal (2016) highlighted the importance to additionally measure the causality between m-banking intention and actual behavior. Therefore, this study will adapt the UTAUT2 theory and examine the impact of each of its constructs on a consumer's intention to adopt m-banking app adoption and use within the Pakistani context. To date, and to the best of the researchers' knowledge, no studies have utilized the unified theory of acceptance and use of technology (UTAUT2) model to assess m-banking apps intention and use in Pakistan.

Literature Review

The original UTAUT dictates four variables i.e., performance expectancy, effort expectancy, social influence and facilitating conditions (Venkatesh et al., 2003), that influence individuals' acceptance of technology. Later, UTAUT2 theory was improved with integration of three new variables: habit, hedonic motivation and price value (Venkatesh et al., 2012). Nevertheless, researchers have recently suggested that UTAUT2 model incorporate trust (Hanif et al., 2022) and innovativeness (Chauhan et al., 2022) to increase its predictive power and to better understand the technology adoption as a concept (Martins et al., 2014). Furthermore, price value, an original construct of UTAUT2 was removed from this study because the majority of m-banking services and applications are free (Al-Jabri and Sohail, 2012). The current study will therefore assess the impact of each of these eight variables on m-banking apps.

Performance Expectancy

Performance expectancy (PE) is defined as a user's belief that the usage of a certain technology will enhance his/her overall performance. An individual intent to adopt a technology when he feels that the use of technology will increase performance (Tan and Leby Lau, 2016). Prior studies emphasized the significant influence of performance expectancy on the behavior intention to adopt mobile-based communication technologies (Engotoit et al., 2016). Moreover, Yang and Forney (2013) reported that mobile applications increase flexibility, enable customization, save time, and allow for additional information, thereby increasing a user's perceived performance expectancy. Accordingly, this study posits:

H1. Performance expectancy will have a significant positive on behavior intention to adopt m-banking apps

Effort Expectancy

Effort expectancy (EE) is defined as the level of ease an individual associate with the usage of a certain technology (Yu, 2012); accordingly, it states the amount of effort needed to learn about the technology (Tai and Ku, 2013). Users will accept a technology if they assume that applications are easy to use and require minimum level of energy (Park et al., 2007). Without a doubt, ease of navigation is a potential benefit linked with m-banking apps, as it facilitates banking transactions (Sampaio et al., 2017). Thus, the study hypothesizes:

H2. Effort expectancy will have a significant positive effect on behavior intention to adopt m-banking apps.

Social influence

Social influence (SI) is an individual's perception that significant others in his/her life think that he/she should adopt a given technology (Yu, 2012). Concerning a user's behavioral intentions, social influence is a strong predictor of behavioral intentions (Chong and Ngai, 2013). Users are likely to depend greatly on referent feedback and experiences (Yang and Forney, 2013). Therefore, in this study, users would be expected to adopt m-banking apps under the influence of their colleagues, friends, family members, and other experienced users and postulates:

H3. Social influence will have a significant positive effect on behavior intention to adopt on m-banking apps.

Facilitating Conditions

Facilitating conditions (FC) is defined as "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003). Lewis et al., (2013) stated that facilitating conditions has a firm role in technology adoption. Soni et al., 2019 results confirm that facilitating conditions showed significant influence on behavior intention and use behavior. For the case of this study, users will be willing to use m-banking apps if they believe the infrastructure and resources exit to support use of the system, thus this study stipulates:

H4. Facilitating conditions will have a significant positive effect on behavior intention to adopt m-banking apps.

Hedonic Motivation

Hedonic motivation (HM) is defined as the level of pleasure and joy gained from using a technology (Brown and Venkatesh, 2005). Using a new technology with pleasure and enjoyment aspects plays a significant role in enhancing a user's adoption intentions (Alalwan et al., 2015). Indeed, when consumers have positive experiences, while considering them entertaining and enjoyable, users are likely to adopt (Chopdar & Sivakumar, 2019) such as m-banking apps. Therefore, the study hypothesizes:

H5. Hedonic motivation will have a significant positive effect on behavior intention to adopt m-banking apps.

Habit

Habit (HB) is defined as the degree to which an individual performs a certain behavior automatically and repetitively based on experience and knowledge acquired over time (Alalwan et al., 2015). Habit is formed by an accumulation of knowledge and skills over time (Venkatesh et al., 2012). Eriksson et al., (2008) study results empirically established that the user habit is a significant predictor of the customers' adoption of online banking in the USA. In this study, it was followed the proposition of the UTAUT2, which assumes a positive role for habit in motivating the adoption behavior (Venkatesh et al., 2012) particularly in m-banking apps. Thus, the following hypothesis postulates that:

H6. Habit will have a significant positive effect on behavior intention to adopt m-banking apps.

Trust

Trust (TR) in technology refers to users' belief that the use of that technology is trustworthy and reliable (Nikou & Economides, 2017). Trust can be established by decreasing consumer's worries and reservations to enhance adoption intention (Koksal, 2016). Many studies reported that there is a positive relationship between trust and consumer behavior intention (Gu et al., 2016; Gefen, 2000). In self-service technologies, trust is an important construct because there is no personal interaction and financial matters tend to be sensitive in nature (Alalwan et al., 2015), this would lead to customers' switching banks (Farah, 2017). As a fact, Pakistani people are sensitive to trust issues because of their cultural and religious beliefs, particularly in an online setting. Consequently, a higher level of trust in mobile apps will demonstrate a higher willingness to use these apps (Zhao and Bacao, 2020). Accordingly, the current study deduces:

H7: Trust will have a significant positive effect on behavior intention to adopt m-banking apps.

Innovativeness

Innovativeness (INN) refers to an individual's desire to seek out something new and different (Hirschman, 1980). Therefore, a user who like experiencing new technologies would be considered as innovative. No theoretical model of technology acceptance included innovativeness as a major construct, yet it developed provision as a key determinant of innovation adoption across various fields (Agarwal and Prasad, 1998; Cowart et al., 2008). Innovativeness concept is critical for marketing practitioners, and thus is an important extension to UTAUT2 in this study as the original model fails to recognize the importance of individual differences during the adoption process (Slade et al., 2015). Tan et al., (2014) found innovativeness to be the most significant predictor of behavioral intention to use NFC mobile payments in Malaysia. M-banking is a form of self-service technology and applications offer a new tool for balance inquiry, bill payment, and fund transfer (Rahmani et al., 2012) which is technologically different with respect to m-banking services, therefore, it is expected that a consumer's innovativeness will play an important role in m-banking app adoption intention, hence:

H8: Innovativeness will have a significant positive effect on behavior intention to adopt m-banking apps.

Adoption intention and usage behavior

Researchers recommend that a consumer's behavior intention is a highly important area of study because it can directly predict an individual's actual technology usage behavior (Yu, 2012). A significant relationship between adoption intention and actual usage exists for a given new technology (Venkatesh et al., 2003; Venkatesh et al., 2012). Future actions can be forecasted through intentions; as behavioral intentions mediate the relationship between independent behavioral constructs and the actual use itself (Arahita and Hatammimi, 2015). Consequently, the current study posits:

H9: Behavior intention will have a positive significant effect on actual use of m-banking apps.
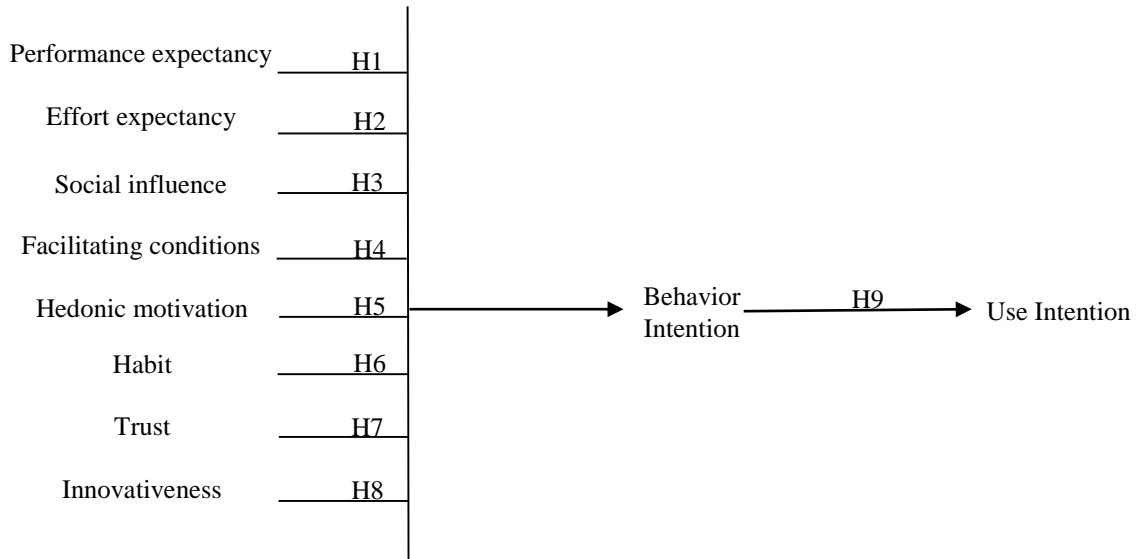
Performance expectancy   H1

Effort expectancy   H2

Social influence   H3

Facilitating conditions   H4

Hedonic motivation   H5   →   Behavior Intention   H9 → Use Intention

Habit   H6

Trust   H7

Innovativeness   H8

Fig. 1. Proposed theoretical framework

Material and Methods

M-banking app users were targeted for data collection in Pakistan via Google Forms. Snowball sampling (Quinlan et al., 2019) was employed by encouraging participants to invite their contacts to take the survey. This study took place between February and April 2023. Cross-sectional approach was applied for the proposed theoretical framework (shown in Fig. 1). A total of 508 answers were gathered, 434 of these were considered valid. The demographic profiles of the respondents are shown in Table 1.

Table 1
Respondent Profile

Variable	Items	Frequency	Percentage
Age	18-25	212	48.85
	26-35	141	32.50
	36-45	49	11.30
	46-55	22	5.05
	56 and above	10	2.30
Gender	Male	233	53.68
	Female	201	46.32
Education	Matriculation	32	7.37
	Intermediate	46	10.60
	Bachelor's Degree	176	40.55
	Master's Degree	121	27.88
	M.Phil./MS/PhD	59	13.60
Mobile banking app experience	1 year or less	224	51.62
	1-2 year	171	39.40
	2 years and more	39	8.98

Measures

Measurement scales were adapted from Venkatesh et al., (2012) for PE, EE, SI, FC, HM, H, BI and UI. Agarwal and Prasad (1998) for INN, and Srivastava et al., (2010) for TR. All measures received responses on a 5-point Likert scale (Strongly Disagree - Strongly Agree). The data were coded and analyzed using Smart-PLS 4.0 software.

Measurement Model

The factor loadings of the items were checked by performing confirmatory factor analysis. The convergent validity of the data was analyzed by calculating average variance extracted (AVE) and composite reliability (CR). Factor loadings (>0.6) (Hair et al., 2011), average variance extracted (>0.5) (Kline, 2023), composite reliability (>0.6) (Bagozzi & Yi, 1988), and Cronbach's alpha (>0.7) (Hardy and Bryman, 2009); all achieved the minimum threshold values, shown in Table 2. Discriminant validity can be measure through Fornell and Larcker (1981) criterion, presented in Table 3. Path analysis diagram is presented in Fig. 2.

Table 2
Factor loading and Convergent validity

Constructs	AVE	CR	Cronbach's alpha	Items	Factor loadings
Performance Expectancy	0.739	0.919	0.882	PE1	0.861
				PE2	0.895
				PE3	0.853
				PE4	0.828
Effort Expectancy	0.722	0.912	0.874	EE1	0.815
				EE2	0.873
				EE3	0.840
				EE4	0.870
Social Influence	0.750	0.900	0.833	SI1	0.861
				SI2	0.888
				SI3	0.848
Facilitating Conditions	0.691	0.899	0.851	FC1	0.803
				FC2	0.875
				FC3	0.836
				FC4	0.809
Hedonic Motivation	0.698	0.874	0.784	HM1	0.828
				HM2	0.866
				HM3	0.812
Habit	0.726	0.914	0.875	HB1	0.856
				HB2	0.853
				HB3	0.825
				HB4	0.874
Trust	0.724	0.887	0.810	TR1	0.845
				TR2	0.872
				TR3	0.835
Innovativeness	0.655	0.883	0.819	INN1	0.843
				INN2	0.874
				INN3	0.848
				INN4	0.655
Behavior Intention	0.802	0.924	0.877	BI1	0.894
				BI2	0.895
				BI3	0.898
Use Intention	0.699	0.912	0.856	UI1	0.874
				UI2	0.851
				UI3	0.839
				UI4	0.776
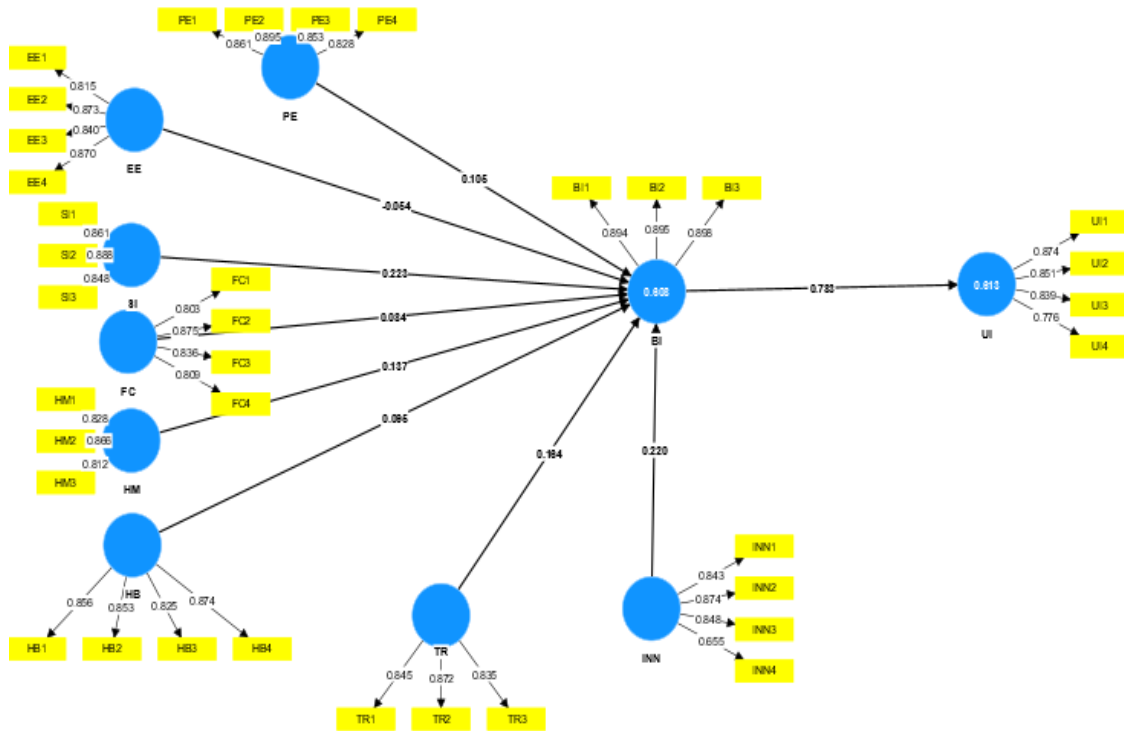
Fig. 2. PLS Algorithm Results

Table 3
Discriminant validity

Constructs	BI	EE	FC	HB	HM	INN	PE	SI	TR	UI
BI	0.896									
EE	0.250	0.850								
FC	0.639	0.313	0.831							
HB	0.410	0.499	0.483	0.852						
HM	0.480	0.113	0.458	0.275	0.836					
INN	0.688	0.318	0.649	0.387	0.417	0.810				
PE	0.495	0.206	0.496	0.242	0.245	0.506	0.860			
SI	0.682	0.329	0.625	0.351	0.424	0.799	0.484	0.866		
TR	0.656	0.304	0.782	0.455	0.444	0.640	0.507	0.647	0.851	
UI	0.783	0.256	0.652	0.475	0.480	0.618	0.455	0.647	0.652	0.836

Notes: Diagonal elements are the square root of the AVE for each construct; Off-diagonal factors correspond to construct inter-correlations.

Structural Model

After the analysis of the measurement model, the researcher tested the structural model to assess the hypothesized relationships using smart-PLS v.4. Structural model suitability in PLS-SEM was calculated on the basis of a number of criteria namely: (a) path coefficients significance level, (b) the coefficient of determination (R^2), and (c) predictive relevance (Q^2) value of the path model (Hair et al., 2012). The PLS algorithm was used to obtain coefficient size. Statistical significance of path coefficients was checked by bootstrapping procedure with 5000 samples for the 434 cases. Table 4 shows the findings from the hypotheses testing.

Table 4
Results of UTAUT2

Directional Paths	β	t-value	p value	UTAUT2
BI → UI		0.783	28.114	0.000

EE → BI	-0.054	1.320	0.187 [n.s.]
FC → BI	0.084	1.161	0.246 [n.s.]
H → BI	0.095	2.042	0.041
HM → BI	0.137	2.774	0.006
INN → BI	0.220	2.969	0.003
PE → BI	0.105	2.428	0.015
SI → BI	0.223	3.520	0.000
TR → BI	0.164	2.356	0.019

	R^2 on BI	R^2 on UI
Base Model	0.599	0.612

	Q^2 on BI	Q^2 on UI
Predictive Relevance of the endogenous latent Constructs	0.580	0.534

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, N = 434. n.s. = non-significant

The results show that behavioral intention to use mobile banking apps was significantly influenced by the UTAUT2 exogenous constructs. Performance expectancy (b = 0.105, $p < 0.05$), social influence (b = 0.223, $p < 0.001$), habit (b = 0.095, $p < 0.05$), hedonic motivation (b = 0.137, $p < 0.01$), trust (b = 0.164, $p < 0.01$), and innovativeness (b = 0.220, $p < 0.01$) have a significant influence on behavioral intention to use m-banking apps. On the contrary, effort expectancy (b = -0.054, p = n.s.), has a negative and insignificant effect on behavioral intention to use m-banking apps, hence H2 was not supported. Moreover, facilitating conditions (b = 0.084, p = n.s.) has insignificant effect on behavior intention, therefore H4 was not confirmed. As predicted, use intention (UI) of m-banking apps was significantly affected by behavioral intention (b = 0.783, $p < 0.001$). These results suggest that H1, H3, H5, H6, H7, H8 and H9 were supported, whereas H2 and H4 were not supported in this study (see Fig.3).
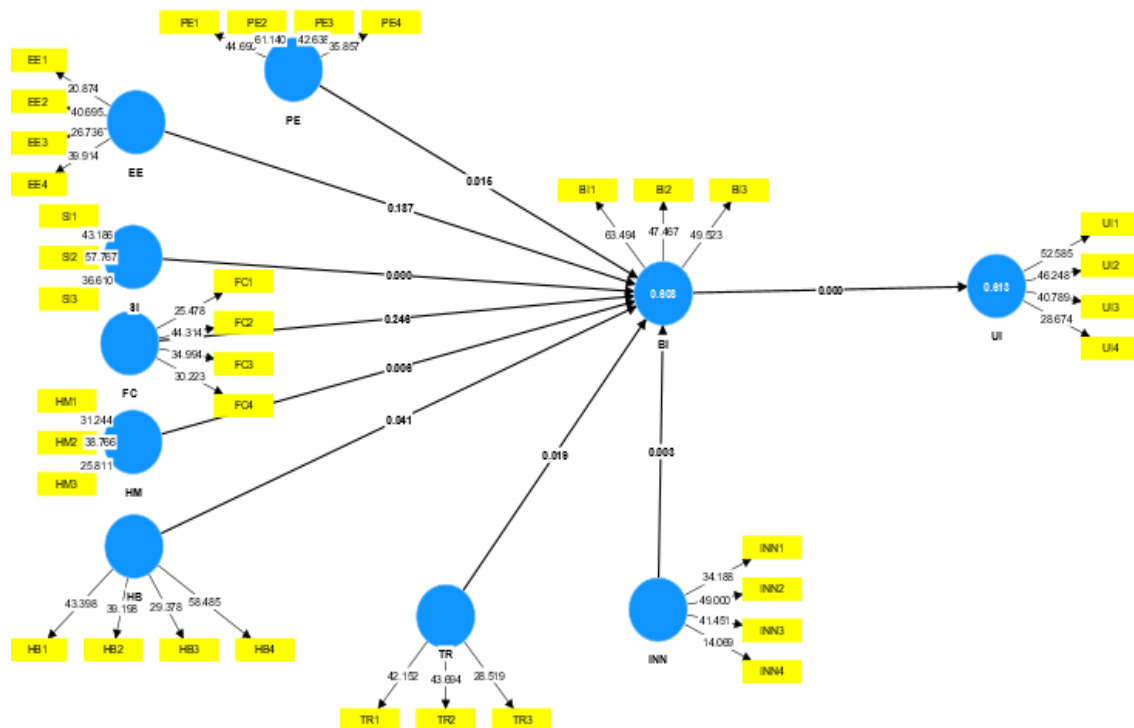

Fig. 3. Bootstrapping results

Predictive relevance and variance explained

Literature suggests R2 values of 0.67, 0.33 and 0.19 as substantial, moderate and weak respectively for model's predictive power assessment (Chin, 1998). Therefore, the research model of this study moderately explains variations in behavioral intention and use

behavior of m-banking apps based on the previous mentioned assumptions (see Table 4). This study applied the cross-validated redundancy measures of Q2 for evaluating the predictive power of the model (Hair et al., 2012). Behavioral intention and use behavior were found to have sufficient predictive relevance. It can be noted in Table 4 that Q2 values are greater than 0.35 for both, hence, suggesting a high predictive relevance (Hair et al., 2012). Therefore, the research model has strong predictive power in clarifying behavioral intention to adopt m-banking apps and the actual use. The results reveal that 60.8 percent of the variation in behavioral intention to use m-banking apps is explained by the constructs performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, habit, trust, and innovativeness. Furthermore, 61.3 percent of the variation in use behavior of m-banking apps is explained by the behavioral intention. Consequently, this study confirms that UTAUT2 is applicable in m-banking apps context.

Discussion

Applying the UTAUT2 model, this study explores the predictors of behavior intention and actual use through mobile banking apps, by investigating the role of performance expectancy, effort expectancy, social influence, facilitating conditions, habit, hedonic motivation, innovativeness, trust, and behavior intention towards actual usage of the m-banking apps. The uniqueness of the research lies in exploring a niche with a growing propensity, research area, namely the mobile applications from a marketing perspective, integrating the UTAUT2 model, and incorporating the trust and innovativeness in the Pakistani m-banking context. These results indicate that Pakistani consumers are influenced by the benefits of mobile banking applications.

The empirical findings suggest that social influence as the most significant predictor of behavior intention reconfirming the results of Abd Rahman et al., (2021) towards adoption of m-banking apps. The result of this study can be explained as the effect tends to be stronger for people without previous experience as they depend more on the social influence of others. Customers with high social influence will have high intentions to use m-banking apps. In addition, innovativeness, hedonic motivation, performance expectancy, habit, trust also significantly predict the intentions of users to adopt m-banking apps, confirming the results of (Chakraborty & Mitra, 2018; Tak & Panwar, 2017; Soni et al., 2019; Soror et al., 2022; Gao et la., 2020) respectively.

The second most significant predictor of behavior intention is innovativeness: thus supporting the relevance of this construct in m-banking apps context, confirming the results of (Chakraborty & Mitra, 2018; Soni et al., 2019). The current study supports the predicting power of this personality trait and shows that people with innovative personality traits (Alalwan et al., 2018) are more likely to use m-banking apps. Trust was incorporated as second exogenous variable of UTAUT2 in this study, and results show that trust has a significant positive relationship with behavior intention to adopt m-banking app, confirming the results of (Gao et la., 2020; Vinerean et al., 2022). In this study, trust seems to have a key role in determining the behavioral intentions for m-banking apps.

Effort expectancy has an insignificant relationship with the behavioral intention to use m-banking app in this study confirming the results of Wut et al., (2022). These findings can be explained by the fact that in general, mobile apps have become a familiar technology in people's everyday life. There are 67 mobile apps on average in a mobile phone, however, commonly used apps average remains just 25 (Shah, 2020). Therefore, many people in the digital era are familiar with this technology. Moreover, facilitating conditions was also insignificant in this study, emphasizing the results are in line with Fadzil, (2017). A possible description for this is that if consumers have no resources and supports, they will not have the intention to use m-banking apps. In addition, Pakistan has a poor technological infrastructure and needs to uplift the economy using digital transformation (Saleem et al., 2022). Finally, the results suggest that a consumer's adoption intention significantly effects actual use behavior, which is in line with extant literature, indicating that adoption

intentions are one of the primary underlying motivators of actual usage behavior (Yu, 2012; Trinh et al., 2020).

Implications

The major theoretical contribution of this study includes re-affirming the central role of behavior intention in consumer technology adoption studies, particularly m-banking and examining usage behavior in contrast to most existing studies, which investigate only behavioral intention. In addition, even though m-banking is becoming a more mature research field, none of the existing empirical research has included the use behavior construct to understand m-banking app adoption. This research is a step further along those line in contributing to the existing m-banking literature by including use behavior as outcome variable and validating the model by collecting appropriate data from the adopters of the m-banking apps in the context of Pakistan. Secondly, the comprehensive review of literature on m-banking adoption also indicates that the proposed UTAUT2 model does not have all context specific external constructs that could more appropriately capture the possible features of m-banking app adoption, particularly in the context of Pakistan. Realizing this gap, this research has included trust, and innovativeness, as the additional constructs along the UTAUT2 model.

This study also has a number of practical implications for marketers, and app developers. A technology system is considered efficient and successful upon providing wanted advantages to stakeholders (Davis, 1989), thus the main objective of a m-banking app should be to ensure application's long-term success. Facilitating conditions was insignificant in this study, therefore, to avoid system failure, the application developer should consider investing additional resources in improving the m-banking app's technological infrastructure (Mohammadi, 2015). Such initiatives and facilitation may help consumer with timely and efficient technological features that improve user intention and actual use of the m-banking app. Developers need to add online help support and online forum to facilitate usage. Moreover, Rodríguez-Torrico et al., (2019) found that low privacy and security issues lead to trust thus our results extend these findings, adding the positive impact on consumers' trust towards using m-banking apps. Banks and app developers should focus on minimum requirements for personal information and adding extra security features in m-banking app for consumers' satisfaction. Furthermore, consumers are more likely to adopt a m-banking app because it enables them to accomplish transactions more quickly, enhances their routine performance, and increases their m-banking app productivity. Thus, these performance expectancy characteristics improve consumers' behavior intentions to adopt and use the m-banking app. In addition, app developers should also need to address hedonic motivation. Developers can consider designing a dual mode, enabling two smart phones to link with each other so that users' can share useful information.

Conclusion

This study investigated the factors that influence behavioral intention and actual usage of the mobile banking app in Pakistan. The factors of the intention to use the m-banking apps were explored in this study, using UTAUT2 model. The current study confirmed the research model for actual m-banking app use with 2 additional constructs namely, trust and innovativeness. This study's findings supported most of the suggested hypotheses. Behavior intention to adopt the m-banking app was found to be significantly related to social influence, innovativeness, hedonic motivation, performance expectancy, trust and habit. However, effort expectancy and facilitating conditions were found to have an insignificant impact on behavior intention. Lastly, the actual utilization of m-banking app is largely impacted by the adoption intentions of consumers.

Recommendations

This study has a number of limitations like all other studies. First, the theoretical model of this work is empirically evaluated using data collected from m-banking app users

in Pakistan. Pakistan, a developing country has witnessed fast technological advancements in recent years. In addition, Pakistan's cultural environment differs at large from those of Western countries. Therefore, this study recommends that future researchers examine this study's model in the context of Western culture. Second, cross-sectional research was employed in this study. As intentions and usage behavior change over time, the current study recommends future researchers should collect longitudinal data: this may yield more reliable findings. Third, a survey method was used to gather data for this research, which is a valid methodology, but to improve the validity and reliability of the results, future studies should investigate various ways of other research design, such as observations and experiments. Finally, this study considered Pakistan only, leading to less generalization. In future, a cross-cultural approach can be used by researchers to assess the impact of cultural dimensions on individual user m-banking app adoption and usage intentions.

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