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Mobile Payment Adoption in Pakistan: Extending UTAUT with Islamic Religiosity

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Abstract: *In recent years, mobile payments have increased around the world. However, limited studies have examined m-payment users' intentions and behaviors. Using the UTAUT framework, this study addresses this research gap by exploring the primary factors that influence users' behavior and intention toward mobile payments. An empirical cross-sectional survey was conducted in order to achieve the study's objectives. Three hundred and twenty-four samples from Pakistan were used to test the proposed conceptual model. The results indicate that performance expectation, social influence, effort expectation, and facilitating conditions are critical to predicting m-payment usage and behavior. There is also an association between Islamic religiosity and behavioral intentions.*

Introduction

A mobile-payment system is integral to people's lives worldwide as one of the most significant innovations in human history. Over the few years, these mobile-based innovations have gradually transformed rigid physical activities into virtual ones. According to Patil et al. (2020), the volume of non-cash transactions has tripled over the last two decades, reaching 539 billion; emerging Asian markets account for most of these transactions. In developing nations such as Pakistan, where formal banking penetration is low, mobile payment systems such as easy-paisa can provide practical solutions for previously unbanked citizens. Despite the many advantages that mobile payments offer consumers, they have not yet become mainstream and have not been widely adopted worldwide (Zhou, 2014).

Indeed, previous research on mobile usage has focused primarily on travel tracking (Raun et al., 2016), mobile commerce (Marinković et al., 2020), mobile banking (Jadil et al., 2021), mobile learning (Alghazi et al., 2021), mobile healthcare (Arfi et al., 2021), and mobile marketing (Wong et al., 2015). In recent years, mobile payments have become increasingly popular across emerging markets (Arjun and Suprabha, 2021), but their adoption rate remains slow (Zhou, 2014). Therefore, it is necessary to examine the factors that influence the adoption of mobile payments in emerging economies such as Pakistan (Wu et al., 2021).

Mobile payment is a way of transferring or paying for goods, invoices, or services through

mobile phones. M-payment services are mostly available through bank applications or third-party applications owned by banks or electronic wallet companies (Alkhowaiter, 2022). The purpose of m-payment is to provide authorized services to users by integrating their banking information with the apps (Hwang et al., 2021). Bank transactions in Islamic countries like Pakistan are based on religious ethics and financial values (Azmat et al., 2020). Several research studies have shown that religiosity can influence consumer behavior (Bananuka et al., 2020). Moreover, m-payment is rarely understood from a religious perspective. Hence, more studies are needed in several Islamic countries, such as Pakistan, to determine whether Islam affects mobile payment behavior (Soomro, 2019).

Based on the above discussion, two aspects of mobile payment need further research: (1) the precursor to associated behavior (Chopdar and Balakrishnan, 2020) and (2) how Islamic religiosity affects users' intentions and behavior towards mobile payments (Alkhowaiter, 2020). This research employs the UTAUT framework to investigate these gaps (Venkatesh et al., 2003). Moreover, Venkatesh et al. (2003) recommended adding other relevant constructs to UTAUT to broaden its application in different contexts and places. In their view, future studies should test the model in different cultures and countries to uncover additional factors affecting users to adopt the technology. Thus, the study examines the applicability of the UTAUT model by incorporating Islamic religiosity as an external factor in understanding Pakistani customers' intentions to adopt m-payment. The study will give market managers better insight into consumer perceptions and preferences regarding mobile payments, helping them reach a broader customer base and increase sales.

In the remaining sections of this paper, we discuss the theoretical background of Islamic religiosity and the UTAUT model. We then present our hypotheses, theoretical framework, and methods. Afterward, we analyze the results and discuss the theoretical and practical implications.

Theoretical Background

Unified Theory of Acceptance and Use of Technology (UTAUT)

Several authors have studied the various factors that impact technology adoption behavior. Different psychological and sociological models have been developed for this purpose. In 2003, by integrating eight previous models (i.e., 1. the theory of reasoned action, 2. the motivational model, 3. the technology acceptance model, 4. the theory of planned behavior, 5. the combination theory of planned behavior/technology acceptance model, 6. the diffusion of innovation theory, 7. social cognitive theory and 8. the model of personal computer utilization), the UTAUT framework was developed (Venkatesh et al., 2003).

UTAUT includes four constructs: performance expectancy, facilitating conditions, effort expectancy, and social influence. Additionally, the UTAUT model considers voluntariness, gender, experience, and age as moderating factors that explain behavioral differences among individuals. There has been a large amount of research on the UTAUT model, and its success has been confirmed in several empirical studies (Alalwan and Rana, 2017; Merhi et al., 2019; Venkatesh et al., 2012). The UTAUT is, therefore, a highly valid choice for exploring user behavior and intent to adopt mobile payments in this study.

Religiosity

Generally, religiosity refers to following a religious structure's beliefs, doctrines, and principles established over time (Bhuian and Ahmed, 2018). Previous studies found religiosity strongly predicts consumer behavior (Baazeem, 2018). The banking system in most of the Muslim nations is based on Islamic principles (Bilal and Mydin Meera, 2015). Most Islamic countries (i.e.,

Pakistan) issue Islamic credit cards in place of conventional credit cards (Jamshidi and Hussin, 2016). In this way, the Islamic religion has the potential to influence mobile payments (Alkhowaiter, 2022). Religiosity is therefore incorporated into the conceptual model as a potential antecedent.

Hypothesis Development

Performance Expectancy

Performance expectancy (PE) describes how people think their job performance will improve when they use the system (Venkatesh and Davis, 2003). As for m-payments, people will adopt the technology when they realize how useful they are to their financial and transactional needs. Studies show that performance expectancy influences behavioral intentions significantly when it comes to specific technologies like mobile commerce (Nur and Panggabean, 2021), mobile learning (Chao, 2019), and mobile payment services (Jung et al., 2020). This explanation leads to the following hypothesis:

H1: Behavior intention is significantly influenced by performance expectancy.

Effort Expectancy

An effort expectation (EE) is how people view an easier-to-use, problem-free, and error-free system (Venkatesh and Davis, 2003). Research has demonstrated that effort expectancy affects a person's decision to adopt a specific technology, including a mobile payment system (Nur and Panggabean, 2021; Patil et al., 2020). In light of the explanation above, we can hypothesize:

H2: Behavior intention is significantly influenced by effort expectancy.

Social Influence

A person's intention to use a particular technology is influenced by nearby people (Venkatesh and Davis, 2003). Social influence (SI) refers to persuading people to adopt and use mobile payment systems if other people perceive them as beneficial (Nassar et al., 2019). Research has shown that social influences significantly impact behavioral intentions in using mobile payment systems (Kim et al., 2010; Lisana, 2020; Upadhyay et al., 2022). Accordingly, we can formulate the following hypothesis:

H3: Behavior intention is significantly influenced by social influence.

Facilitating Conditions

A consumer's belief in the support and resources available to use technology is called the facilitating conditions (FC) (Venkatesh and Davis, 2003). Accordingly, if the operational infrastructure for mobile payments is in place and facilitates its use, consumers will adopt it (Oliveira et al., 2016). Various studies have demonstrated that facilitating conditions significantly impact intentions and use behavior regarding mobile payments (Morosan and DeFranco, 2016). Hence, we hypothesized:

H4. Behavior intention is significantly influenced by facilitating conditions.

H5. Use behavior is significantly influenced by facilitating conditions.

Islamic Religiosity

The nature of religion can be intrinsic and extrinsic, as noted above. People's materialistic behaviors can be influenced by extrinsic religiosity (Casabayó et al., 2020). However, its primary aim is to achieve social recognition (Çavuşoğlu et al., 2021). Evidence shows that religiosity can profoundly influence social behavior (Felix et al., 2018). The majority of the population in Islamic countries is Muslim, and their religious adherence impacts every aspect of their lives (Usman et al., 2022). The tenets and norms of Islam have an immense influence on every aspect of human society, including the use of technology (Suhartanto et al., 2019). Several studies have found that Islamic religiosity (IR) could influence customers' intention to use m-payment services (Alkhowaiter, 2022). Hence, it seems reasonable to hypothesize:

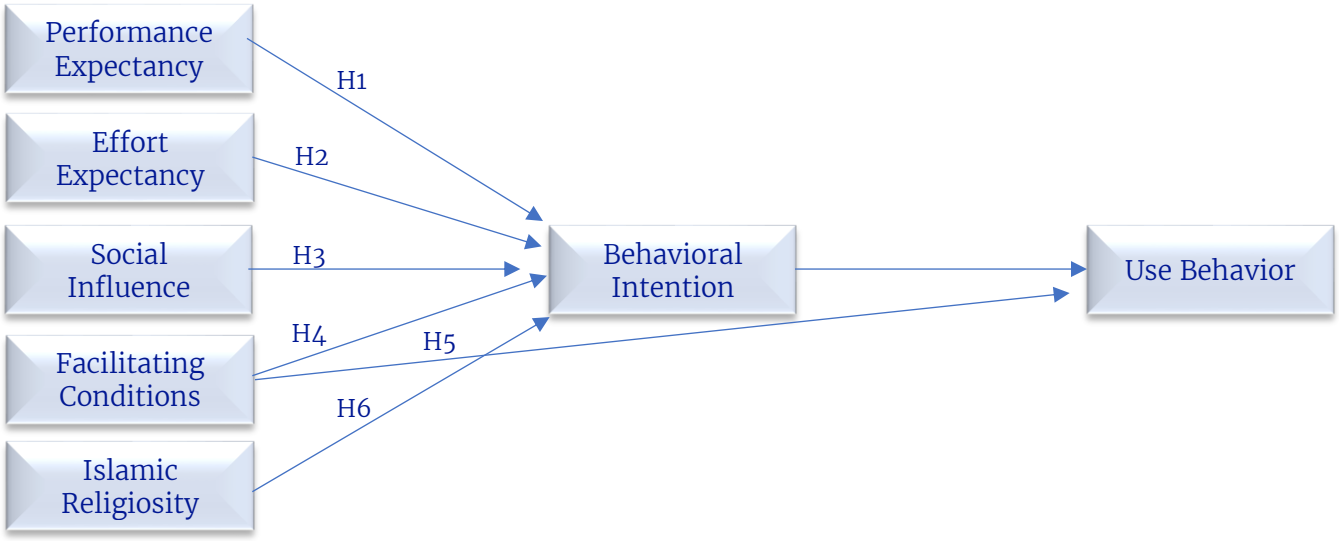
H6. Behavior intention is significantly influenced by Islamic religiosity.

Theoretical Framework

In the study, an extended UTAUT model was proposed with an additional variable, "Islamic religiosity." Figure 1 illustrates the new proposed model, which aims to increase both the predictive power and the reliability of the existing theory. Figure 1 shows all the proposed hypotheses of the study.

Figure 1

Conceptual model modified by Venkatesh et al. (2003)



Research Methodology

Research Design and Data Collection

In the study, researchers used a cross-sectional survey design to collect data. This study targets bank customers who primarily use m-payment to make financial transactions. Lahore, Multan, and Faisalabad were selected as sample locations in Punjab Province, Pakistan. Internet penetration is high in these cities, and most residents have access to Internet connectivity. Three hundred and twenty-four (324) samples were analyzed from three hundred and ninety (390) responses. In Table 1, we present the respondents' socio-demographic characteristics.

Table 1

Demographic Profile of Respondents (n=324)

Demography		Frequency	Percentage (%)
Gender	Female	146	45.1
	Male	178	54.9
Age Group	Up to 20	28	8.6
	21-30	161	49.7
	31-40	117	36.1
	41-50	12	3.7
	Above 50	6	1.9
Education Level	Matric	23	7.1
	Intermediate	78	24.1
	Bachelor's degree	98	30.2

	Master's degree	87	26.9
	PhD	16	4.9
	Others	22	6.8
City	Lahore	95	29.3
	Multan	118	36.4
	Faisalabad	111	34.3

Constructs and Questionnaire

We prepared a self-administered questionnaire in the Urdu language to avoid linguistic differences (Brislin, 1976). There were two sections in the survey instrument. The first section covers the respondents' characteristics (age, gender, city of residence, academic level, etc.). The second section contains measurement items (see Table 2) adapted from previous studies with similar constructs. Items related to behavioral intention facilitating conditions, effort expectancy, and performance expectancy were borrowed by Venkatesh et al. (2012). For social influence (SI), instruments were derived from Venkatesh et al. (2003). Items for Islamic religiosity (IR) were adapted by Soomro (2019). Based on the Likert scale, all measurement items were scored from 1 to 7 (strongly disagree to strongly agree). Measurements of use behavior were made on a Seven-point time scale (never to once a year, several times a year, once a month, several times a month, several times a week, and several times a day). UB items were adapted by Alalwan and Rana (2017).

Table 2

Measurements of constructs

Constructs	Items	Source
Behavioral Intention	BI1: I intend to use the M-payment application in the future. BI2: I will always try to use the M-payment application in my daily life. BI3: I predict I will use the M-payment application in the future.	Venkatesh et al., (2012)
Effort Expectancy	EE1: Learning how to use the M-payment application is easy for me. EE2: My interaction with the M-payment application is clear and understandable. EE3: I find the M-payment application easy to use. EE4: It is easy for me to become skillful at using the M-payment application.	Venkatesh et al., (2012)
Facilitating Conditions	FC1: I have the resources necessary to use the M-payment application. FC2: I have the knowledge necessary for to M-payment application. FC3: M-payment application is compatible with other technologies I use. FC4: I can get help from others when I have difficulties using the M-payment application.	Venkatesh et al., (2012)
Performance Expectancy	PE1: Using the M-payment application increases my chances of achieving tasks that are important to me. PE2: Using the M-payment application helps me accomplish tasks more quickly.	Venkatesh et al., (2012)

	PE3: Using the M-payment application increases my performance.	
Islamic Religiosity	IR1: I have Islamic beliefs, and I Practice the teachings of Islam IR2: In my personal life, religion is very important. IR3: Islam helps me to have a better life.	(Soomro, 2019)
Use Behavior	UB1: I use the M-payment application for balance inquiries and downloaded bank statements. UB2: I use the M-payment application for fund transfers. UB3: I use the M-payment application for paying bills.	Alalwan and Rana, (2017)

Analysis

A model hypothesis was tested using partial least square structural equation modeling (PLS-SEM) employing the SmartPLS 3.2.8. According to Vuong and Trang (2020), PLS can be very useful for causal analysis in behavioral studies. PLS can also analyze complex research problems that include unobserved variables and complex interactions between variables. Additionally, it works well with small sample sizes (Vuong and Trang, 2020). Considering the small sample size of the study (324 participants), PLS-SEM was deemed an appropriate advanced inferential analysis technique. Indeed, the study used PLS-SEM to evaluate the conceptual model in two stages: measurement and structural modeling assessment (Anderson and Gerbing, 1988).

Results

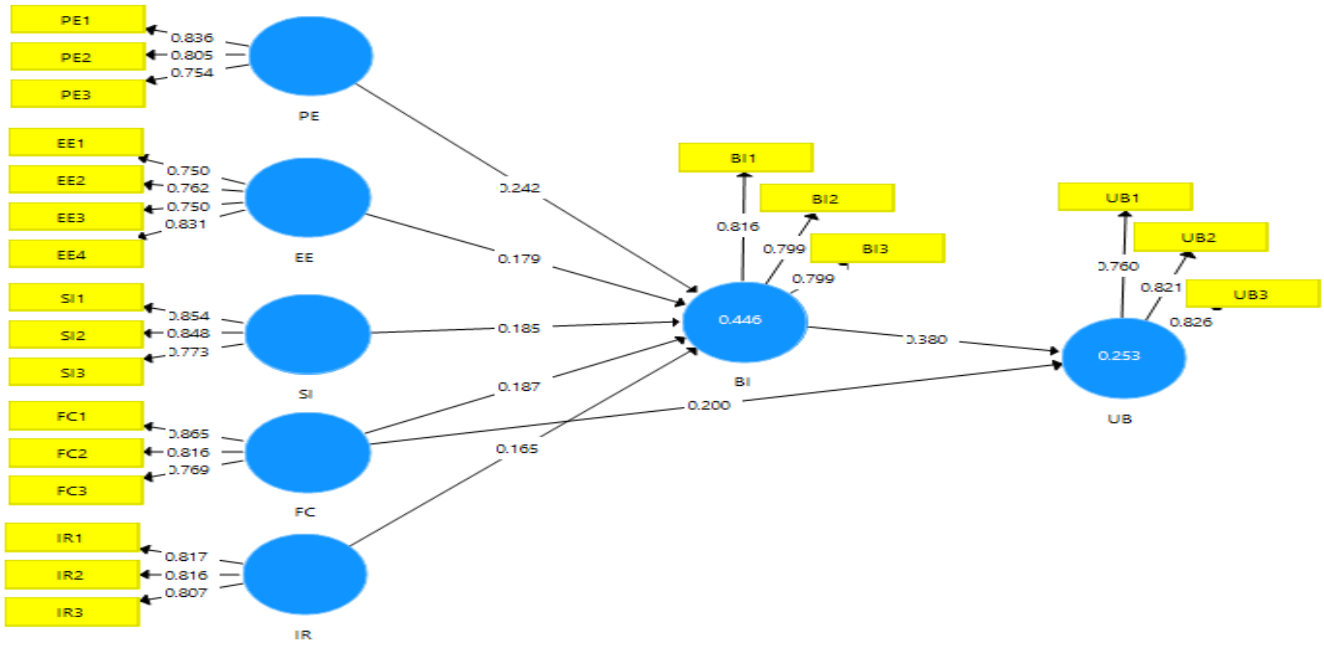
Measurement Model

Based on Hair and Sarstedt (2017), the measurement model assessment consists of

1. Estimate composite reliability, Cronbach's alpha values, and indicator reliability to determine internal reliability consistency.
2. Convergent validity estimation using the average variance extraction and outer loadings.
3. Discriminant validity assessment by determining fornell-Larker criteria and HTMT ratios.

Figure 2

Research model path loadings



Internal Consistency Reliability

The measurement model was initially evaluated based on its internal reliability consistency. Table 3 shows (a) indicator reliability values, which should not be less than 0.4 (Urbach and Ahlemann, 2010), (b) Cronbach's alpha (α), which should be 0.7 or higher (Nunnally, 1967, p. 226), and (c) composite reliability values, which are acceptable from the range of 0.700 to 0.900 (Hair and Ringle, 2019).

Table 3

An analysis of internal consistency and convergence of validity

Constructs	Items	Loadings λ	indicator reliability	Cronbach Alpha	Composite Reliability	AVE
BI	BI1	0.816	0.666	0.728	0.846	0.647
	BI2	0.799	0.638			
	BI3	0.799	0.638			
EE	EE1	0.750	0.563	0.778	0.856	0.599
	EE2	0.762	0.581			
	EE3	0.750	0.563			
	EE4	0.831	0.691			
FC	FC1	0.865	0.748	0.752	0.858	0.668
	FC2	0.816	0.666			
	FC3	0.769	0.591			
IR	IR1	0.817	0.667	0.745	0.855	0.662
	IR2	0.816	0.666			
	IR3	0.807	0.651			
PE	PE1	0.836	0.699	0.716	0.841	0.638
	PE2	0.805	0.648			
	PE3	0.754	0.569			
SI	SI1	0.854	0.729	0.768	0.865	0.682
	SI2	0.848	0.719			
	SI3	0.773	0.598			
UB	UB1	0.760	0.578	0.724	0.845	0.645
	UB2	0.821	0.674			
	UB3	0.826	0.682			

Notes: FC, facilitating conditions; EE, effort expectancy; BI, behavioral intention; SI, social influence; PE, performance expectancy; UB, use behavior; IR, Islamic religiosity. AVE; average variance extraction; VIF, variance inflation factor.

Convergent Validity

It is recommended that the average variance extracted (AVE) be at least 0.5 in order to ensure convergent validity (Fornell and Larcker, 1981; Hair and Anderson, 2010), and the loading values should be 0.50 or more (Fornell and Larcker, 1981). Table 3 shows ideal values for AVE and loadings.

Discriminant Validity

This study considered Heterotrait-Monotrait and Fornell-Larcker criteria to ensure discriminant

validity. The Fornell-Larcker criteria indicate that correlation values between constructs are tabulated off-diagonally, but square roots of AVE are arranged diagonally. Accordingly, Table 5 shows a higher "square root" of the construct's AVE than the constructs with the highest correlation (Fornell and Larcker, 1981). Table 4 indicates that HTMT was below 0.85 in all constructs (Dijkstra and Henseler, 2015).

Table 4

Hetrotrait-Monotrait values

	BI	EE	FC	IR	PE	SI	UB
BI							
EE	0.610						
FC	0.605	0.412					
IR	0.572	0.384	0.432				
PE	0.720	0.612	0.539	0.510			
SI	0.585	0.487	0.416	0.367	0.448		
UB	0.645	0.387	0.498	0.409	0.565	0.363	

Notes: EE, effort expectancy; IR, Islamic religiosity; BI, behavioral intention; FC, facilitating conditions; PE, performance expectancy; UB, use behavior; SI, social influence.

Table 5

Fornell-Larker values

	BI	EE	FC	IR	PE	SI	UB
BI	0.804						
EE	0.469	0.774					
FC	0.452	0.320	0.817				
IR	0.420	0.290	0.324	0.814			
PE	0.523	0.460	0.396	0.373	0.799		
SI	0.441	0.381	0.317	0.280	0.338	0.826	
UB	0.470	0.298	0.372	0.299	0.407	0.276	0.803

Notes: EE, effort expectancy; BI, behavioral intention; PE, performance expectancy; IR, Islamic religiosity. FC, facilitating conditions; SI, social influence; UB, use behavior.

Structural Model Evaluation

According to Hair and Sarstedt (2017), five basic criteria should be considered when assessing structural models; (1). collinearity assessment or variance inflation factor (2). level of R^2 values; (3). significance of the path coefficient; (4) effect size (f^2); and (5). predictive relevance (Q^2).

Collinearity Assessment

We tested the collinearity of the research model both vertically and laterally using a full collinearity testing approach (Kock, 2014, 2015). In Table 6, all VIF values below the upper limit of 5 indicate that there are no vertical or lateral collinearity issues in the model (Garson, 2016; Hair and Page, 2011).

Significance of the Path Coefficient

Table 6 presents the bootstrapped samples, their means, standard deviations, t-values, and p-values. It could be observed that all constructs with p-values less than 0.10 were significantly

influencing customers' BI and UB to adopt m-payment (Kwateng and Charity, 2019).

Effect Size (f^2)

An effect size can be explained by the amount of influence an exogenous construct has on an endogenous construct (Chin, 1998). If the effect size (f^2) value is 0.35, 0.15, or 0.02, then the value is larger, medium, and smaller (Cohen, 1988). Table 6 shows that behavioral intention has a more significant effect on user behavior. While effort expectancy, Islamic religiosity, facilitating conditions, performance expectancy, and social influence have a medium effect on intention. Facilitating conditions were also found with a medium effect on user behavior.

Table 6

Significant testing results of the path coefficient with effect size square (f^2) and VIF

Hypotheses Relationships	OS	SM	SD	f^2	VIF	t-values	p-values	Significant level
BI -> UB	0.380	0.382	0.049	0.380	1.257	7.714	0.000	Significant
EE -> BI	0.179	0.182	0.046	0.179	1.397	3.846	0.000	Significant
FC -> BI	0.187	0.188	0.056	0.187	1.295	3.350	0.001	Significant
FC -> UB	0.200	0.199	0.056	0.271	1.257	3.581	0.000	Significant
IR -> BI	0.165	0.169	0.046	0.165	1.246	3.592	0.000	Significant
PE -> BI	0.242	0.239	0.054	0.242	1.483	4.460	0.000	Significant
SI -> BI	0.185	0.183	0.045	0.185	1.273	4.128	0.000	Significant

Notes: EE, effort expectancy; SI, social influence; IR, Islamic religiosity; FC, facilitating conditions; PE, performance expectancy; BI, behavioral intention; UB, use behavior; VIF, variance inflation factor; f^2, effect size; SD, Standard Deviation; SM, Sample mean; OS, Original sample.

Level of R^2 Values

R^2 values of 0.02 are described as weak, 0.15 as moderate, and 0.35 as substantial (Cohen, 1988). Based on the R^2 adjusted value of 0.437 for BI and 0.248 for UB, the model shows substantial predictive accuracy in Table 7.

Predictive Relevance Q^2

Table 7 shows endogenous latent variables have cross-validated redundancies of 0.278, 0.124, and 0.089, respectively. All values meet criteria that require values to be greater than zero to meet significant predictive relevance for all endogenous constructs (Cha, 1994).

Table 7

A measure of the determination of R squares and adjusted R squares and predictability of the model (Q^2)

Construct	R Square	R Square Adjusted	Cross-Validated commonality	Cross-Validated Redundancy
BI	0.454	0.437	0.207	0.268
UB	0.153	0.248	0.149	0.151

Discussion and Conclusion

In our research, we examined the role of "Islamic religiosity" on the behavioral intentions of m-payment consumers in Pakistan and improved the UTAUT model's predictive effectiveness. The study's findings support the author's research model since all hypotheses were supported. The results of our study confirmed that Pakistani customers consider the utility aspects of m-payment apps when deciding whether to use

them. Research has shown that performance expectations significantly impact behavioral intentions (Farah et al., 2018). Furthermore, effort expectancy and behavioral intentions were found to be significantly correlated in our study. Results show customers prefer simple, easy, and minimal effort when using m-payment apps. A study by Alalwan and Rana (2017) has also demonstrated that effort expectancy and behavioral intention correlate positively. Our analysis also shows that facilitating conditions impact m-payment behavior. Regarding functionality, resources, and skills, m-payment apps are more important to consumers and positively influence their behavior (Alalwan and Rana, 2017; Alalwan et al., 2016). Therefore, companies should enhance their organizational and technological infrastructures to increase the acceptance of m-payment apps (Farah et al., 2018).

Indeed, the findings show a significant effect of social influence on behavioral intention. According to research, people are more likely to use new technologies in their daily lives if others recommend and endorse them (Mbrokoh, 2016). Behavioral intention and social influence were also found to be positively correlated in a study by Farah et al. (2018). Indeed, our study found a positive correlation between Islamic religiousness and behavioral intentions. Results indicate that Islamic religiosity is associated with a higher behavioral intention to use mobile payment apps. Past studies have confirmed our findings that Islamic religious beliefs positively affect technology adoption behavior (Suhartanto et al., 2019).

In particular, this study provides a comprehensive model for explaining the relationship between Islamic religiosity and m-payment usage among Muslim customers. As a result, the proposed extended UTAUT model was validated by the results and findings of the study. The findings of the study have led to a substantial improvement in understanding and predicting customer behavior and technology adoption with UTAUT. A possible explanation for this improvement is that UTAUT has never empirically tested a religiosity construct in Pakistan.

Theoretical and Practical Implications

This research is unique in its theoretical approach because of the combination of the UTAUT model with Islamic religiosity. The study adds to the body of literature by incorporating Islamic religiosity (IR) into the UTAUT model, as well as discussing technology adoption in the context of an emerging Islamic economy (Pakistan). A few studies have been carried out on the topic, so the findings of this study confirm the validity of the extended UTAUT model.

As a result of this study, managers can also apply its findings to their daily practices by emphasizing the importance of the Islamic religion to the behavior of Muslim customers. The marketing manager may be required to plan and execute marketing strategies by considering customers' religious beliefs. A bank should not promote interest-bearing services in Islamic countries that have a high level of religious devotion among the consumers. Banks in Islamic nations might offer interest-free products (like m-payment) as a way to establish trust and improve their image.

Limitations and Future Recommendations

Despite contributing to existing literature and filling a significant gap in knowledge, this study also has limitations, particularly regarding sampling. Respondents in this study were primarily young and educated, and their behavior and characteristics may differ from those of other people. Highly qualified and young customers are generally early adopters of new innovative technology, so generalizing the findings may take time and effort. In addition, the model of the study can be applied to other Muslim countries. Additionally, the extended UTAUT model can test religiosity as a moderator and mediator.

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