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User Adoption Of M-Commerce Apps In Pakistan: UTAUT2 Framework Based Analysis

Muhammad Zohaib Irshad[1] , Dr. Anum Tariq[2]

[1]*PhD Scholar (corresponding author), The University of Faisalabad*.
[2]*Assistant Professor, The University of Faisalabad.*

Abstract

Purpose
This study purpose is to identify the factors influencing users' intention of using m-commerce apps in their smartphones.

Design/methodology/approach
A questionnaire was established using available scales in the available literature. 359 valid responses were obtained for statistical analysis from a total of 384 survey participants.

Findings
Significant predictors of m-commerce app usage intention included effort expectancy performance expectancy, price value, social influence, facilitating conditions, habit and perceived privacy were found significant predictors of m-commerce apps, except for hedonic motivation, which inversely impacts behavior intention. Usage behavior was largely mediated by usage intention, followed by facilitation conditions.

Practical implications
The study gives app developers vital cues on user expectations from the apps. Oftentimes, developers tend to focus entirely on the material utility of their apps, neglecting every other factor influencing use. One specific implication is that travel app usage behavior is not a hedonistic activity but still tourism is a hedonistic activity.

Originality/value
This is one of the few studies to examine the adoption of smartphone m-commerce apps in an emerging economy context by using extended unified theory of acceptance and use of technology 2 framework with one additional construct.

1. Introduction

Smartphone usage has been growing at a higher speed around the world (Horng & Chao, 2018). Two thirds of the global population have accepted smartphones as consumer technology[1]. Smartphones crossed six billion subscriptions

[1] https://www.gsmaintelligence.com/research/?file=3df1b7d57b1e63a0cbc3d585feb82dc2&download

worldwide and are expected to increase rapidly in coming years[2]. The vital characteristics of smartphones, i.e., mobility, low cost, universality, lightweight and connectivity from anywhere and anytime, boosts smartphone usage in a number of ways (Klopfer et al., 2002). Smartphone usage encourages the researchers to realize fresh opportunities in many fields (Aijaz et al., 2019). This has given rise to mobile commerce (m-commerce) as "an extension of e-commerce where business activities are performed in a wireless environment using mobile devices" (Zhang et al., 2012). Online companies need to understand how consumers use this new technology and most important what they value including knowing about the users (Shukla & Nigam, 2018). Therefore, m-commerce turn into a "business phenomenon" having potential for a large market (Zhang et al., 2012).

Technology adoption is becoming a necessity to survive (Khaskheli et al., 2017), however, the actual m-commerce usage remains low in emerging countries (Liébana-Cabanillas et al., 2017). Adoption of new technology and acceptance of m-commerce are related to each other (Anwar et al., 2021). Pakistan, an emerging economy, number of transactions have started through mobile applications, however, m-commerce usage is still in developing phase (Rahman & Rafiq, 2021). At the moment, low literacy rate, insufficient technological infrastructure, little knowhow about consumer behavior with regards to online shopping (Saleem et al., 2022), limited network coverage, and security of the account, are the main reasons in m-commerce adoption process (Kale & Mente, 2018). The drivers and barriers to m-commerce adoption were not understood particularly in developing countries (Anwar et al., 2021), therefore, there is a need to study the factors that are crucial for m-commerce adoption in Pakistan. In addition, users' data security is an important theme worldwide. A recent survey reported respondents' data privacy concerns, with the most alarming concerns being identity theft and fraud with 72 percent[3]. Moreover, literature focused little attention on the role of privacy concerns (Fortes et al., 2017). Consequently, to achieve this study objective with the help of identified gaps, the following research questions are presented,

RQ1: How does technology influence consumer behavior for m-commerce apps?

RQ2: How are the identified factors important in forecasting m-commerce apps' consumer behavior?

RQ3: Which factors (among those identified) have a significant influence on m-commerce apps adoption?

The significance of this study is twofold. First, it contributes to the m-commerce apps adoption literature. Second, it identifies the determinants of m-commerce apps adoption for shopping which can be used by practitioners to increase the adoption. The results of this study contribute to the empirical evidence by identifying the role of perceived privacy along with determinants of UTAUT2 in m-commerce apps adoption.

2. Literature Review and Hypotheses Development

Many researchers established theoretical frameworks and models to estimate the user

[2] https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/

[3] https://www.statista.com/statistics/248488/frequency-with-which-us-internet-users-worry-about-online-privacy/#statisticContainer

behavior towards technology adoption. The extended Unified theory of acceptance and use of technology (UTAUT2) proposed by Venkatesh et al., (2012), which includes original seven constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions, hedonic motivation, price value and habit. UTAUT2's focus is on consumer use context and demonstrate a better predictive validity in technology consumption context (Venkatesh et al., 2012), advising the estimation of individual consumer predict up-to 70% of behavior intention (Venkatesh et al., 2012). Prior research has applied the UTAUT2 model in various settings including social networking websites (Soror et al., 2022), online games (Ramírez-Correa et al., 2019), and mobile health (Duarte & Pinho, 2019), online travel purchasing (Slade et al., 2015), mobile learning (Arain et al., 2019), and mobile apps (Wottrich et al., 2018). In the following sections, we review the related literature, identify gaps, and propose hypotheses.

2.1 Performance Expectancy

Existing research confirms that consumers are more likely to use technology that is more effective and produces favorable outcomes which are expected by the consumers (Compeau and Higgins, 1995). This construct is believed to be the most important and significant predictor of intention to use technology (Sair, & Danish, 2018). Previous literature identified the positive and significant relationship between performance expectancy and behavioral intention (Chopdar and Sivakumar, 2019) across several fields including online travel purchasing (Slade et al., 2015), telebanking services (Alalwan et al., 2016) and mobile banking (Tan and Leby Lau, 2016). Thus,

H1: Performance expectancy positively influences users' behavior intention to adopt m-commerce apps

2.2 Effort expectancy

Consumers prefer to use technology that is easy to understand and can deliver maximum benefits (Davis et al., 1989). According to Cimperman et al., (2016), the antecedents of effort expectancy are ease of use, complexity, and perceived ease of use. Effort expectancy has proved to be a strong predictor of behavioral intentions (Venkatesh et al., 2012) in various contexts, including internet banking (Wang et al., 2003)), mobile payments (Teo et al., 2015), and mobile banking (Tan and Leby Lau, 2016), and Therefore,

H2: Effort expectancy positively influences users' behavior intention to adopt m-commerce apps

2.3 Social influence

According to Ajzen (1991), a person is more likely to intend to engage in a given behavior if he or she thinks that a given behavior will be accepted by his or her peer group. Social influence refers to the effect of another party's opinion on an individual's intention to adopt and use a technology (Venkatesh et al., 2012). Third parties' opinions determine an individual's purchase intention (Sun and Chi, 2018) Singh et al., (2020) found social influence is an essential factor of behavior intention and strong predictor of behavioral intentions (Chong and Ngai, 2013) across various contexts including social commerce (Akman and Mishra, 2017), mobile banking (Tan and Leby Lau, 2016), mobile payments (Slade et al., 2015), learning management system (Ain et al., 2016). Therefore, this study hypothesizes

H3: Social influence positively influences users' behavior intention to adopt m-commerce apps

2.4 Facilitating conditions

In this study, facilitating conditions reflect the effect of necessary resources (internet connectivity, memory in the smartphone to download an app, online help and support) and

required knowledge necessary to operate m-commerce apps. Lewis et al., (2013) stated that facilitating conditions has a firm role in technology adoption. Moreover, facilitating conditions will hinder the intention to use new applications if found insufficient. According to Venkatesh et al (2012), facilitating conditions significantly effects both behavioral intentions and actual usage. The significant relationship is consistent in various fields like mobile learning (Arain et al., 2019), Internet banking (Foon and Fah, 2011), augmented reality technology (Faqih & Jaradat, 2021), and mobile apps (Hew et al., 2015). Therefore,

H4a: Facilitating conditions positively influences users' behavior intention to adopt m-commerce apps

H4b: Facilitating conditions positively influences users' use intention to use m-commerce apps

2.5 Hedonic motivation

Hedonic motivation refers to the pleasure that a consumer derives from using a given technology (Venkatesh et al., 2012). Hedonic motivation which is an intrinsic motivation, is considered an important predictor of technology acceptance and use (Venkatesh et al., 2012) based on the literature consumer context (Brown and Venkatesh, 2005) and Information System research (Van der Heijden, 2004). Hedonic motivation has found to be strong predictor of adoption of telebanking (Alalwan et al., 2016), social networking sites (Herrero and San Martín, 2017), learning management system (Raman & Don, 2013), e-learning systems (El-Masri and Tarhini, 2017), online games (Ramírez-Correa et al., 2019), NFC mobile payments (Slade et al., 2015), hotel booking (Chang et al., 2019), and mobile apps (Hew et al., 2015). Accordingly, this study hypothesized:

H5: Hedonic motivation positively influences users' behavior intention to adopt m-commerce apps

2.6 Price value

From a theoretical viewpoint, price value follows from the concept of perceived value (Zeithaml et al., 1988). Liu et al., (2015) found that perceived value significantly influences behavioral intention. Venkatesh et al., (2012) also argued that price value is a significant predictor of behavior intention to adopt a technology. Price value may include the device and internet data costs, and other types of service charges. Hospitality and tourism sectors have announced innovative pricing strategies to provide value in mobile apps (Gupta et al., 2018). Furthermore, Anwar et al., (2021) revealed that perceived cost/price value is a strong barrier to m-commerce adoption and usage in emerging economies. The study hypothesizes:

H6: Price value positively influences users' behavior intention to adopt m-commerce apps

2.7 Habit

Past experiences lead to habit (Venkatesh et al., 2012) and consistency in past behavior is considered to be one of the principal determinants of present behavior (Ajzen, 2002). Prior studies have revealed significant effects of consumer habit on behavioral intentions and actual usage (Venkatesh et al., 2012; Gupta et al., 2018) in various contexts including social networking websites (Soror et al., 2022), online games (Ramírez-Correa et al., 2019), and mobile health (Duarte & Pinho, 2019). Based on these findings, study hypothesizes

H7a: Habit positively influences users' behavior intention to adopt m-commerce apps

H7b: Habit positively influences users' use intention to use m-commerce apps

2.8 Perceived privacy

Vimalkumar et al., (2021) defined perceived privacy is "the degree to which one's beliefs and the right to exercise control over the collection and use of one's personal information, even after it has been disclosed to others". Perceived privacy is the possibility that online companies collect data about individuals and use it inappropriately (Jarvenpaa and Toad, 1996). Perceived privacy affects people's willingness to disclose information to information technology based services (Joinson et al., 2010). Individuals' concerns about data privacy, misuse and disclosure undermine their trustworthiness (Kaleta and Mahadevan, 2020). Furthermore, Fortes et al., (2017) confirmed that there is a significant direct effect of privacy concerns on intention. Wottrich et al., (2018) established that mobile app users' privacy concerns in Western Europe negatively affected their intentions to grant app permission requests to access their personal information. Therefore,

H8: Perceived privacy positively influences users' behavior intention to adopt m-commerce apps

2.9 Behavior intention

Behavioral intention is considered as the best predictor of behavior (Fishbein and Ajzen, 1975), which is also well established in consumer research literature (Martins et al., 2014). Extant research in the area of mobile banking (Albashrawi et al., 2019), ICT based classes (Kim & Lee, 2022), QR-payment (Suo et al., 2022), and internet banking (Alalwan et al., 2018) establish the relationship between behavioral intentions and actual use. Therefore,

H9: Behavior intention to adopt m-commerce apps influences users' use intention

3. Methodology

3.1 Sampling and data collection

The proposed theoretical framework (shown in Fig. 1) was tested using a cross-sectional approach. Target population for this study were active users of mobile commerce apps. Primary data for the study was collected using structured questionnaires (see Appendix A) administered to respondents electronically through google forms. A convenient sampling technique was used to collect the data from Pakistani users. 500 questionnaires were distributed online, out of which 411 were returned, and 359 were determined to be valid giving an effective response rate of 70.8%.

3.2 Construct Measurement and Analysis

According to the conceptual model of this study (Figure 1), ten variables were used to measure consumer behaviors toward m-commerce apps. Eight variables were chosen as independent variables: performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), hedonic motivation (HM), habit (H), price value (PV), and perceived privacy (PP). Moreover, Use behavior/intention (UI) was set as dependent variable, and behavior intention (BI) served as the mediator variable of this study. The complete questionnaire with the respective sources of measurement items is shown in Appendix A. Each construct's item of the model was measured on a seven-point Likert scale (Strongly Disagree - Strongly Agree) and a separate page consisting each construct was presented to avoid confusion. The data were coded and analyzed using Smart-PLS 3.0 software.

3.3 Method of Analysis: PLS-SEM

The current study used the variance based partial least squares structural equation modeling (PLS-SEM) approach (Chin, 1998) to investigate the research model using Smart-PLS (Ringle, Wende, & Will, 2005). The PLS-SEM approach suits research contexts that are in the early stage of development and have not been studied

extensively (Hair, Sarstedt, Ringle, & Mena, 2012). A two-step approach was used for analysis as recommended by Anderson and Gerbing (1988). The reliability and validity of the measurement model were assessed by using the recommended procedural remedies, followed by the structural model assessment and hypotheses testing using a bootstrapping approach. The settings recommended by Hair et al., (2012) were used in running the PLS-algorithm.

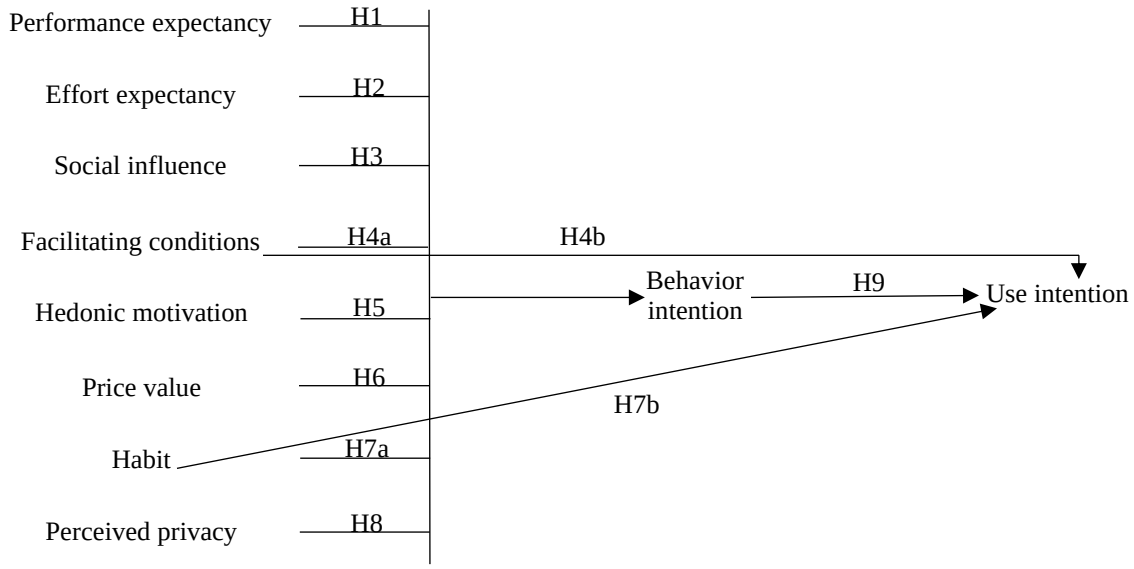

Fig. 1 Proposed theoretical framework for m-commerce app adoption

4. Results

4.1 Demographic Characteristics

This study asked four demographic questions about age, gender, education, and experience of m-commerce apps use in months. In the age category, the largest age group was comprised of respondents between 15 and 22 years (36.20%), followed in descending order by 32% in the age group of 23 and 30 years, which indicates that respondents age is sufficiently mature in terms of age to understand the current study. The demographic characteristics show (Table 1) that the profile of the respondents is adequate because the age group of 15-30 years is more likely to accept the adoption of new technologies (Chimento-Díaz et al., 2022) and the level of education is also healthier to understand the mobile commerce applications.

Table 1: Respondent Characteristics

Variable	Category	Sample Number	Percentage
Age	15-22	130	36.20
	23-30	115	32
	31-38	53	14.90
	39-46	42	11.70
	46 and above	19	5.20
Gender	Male	257	71.60
	Female	102	28.40
	Matriculation	51	14.20

Education	Intermediate	72	20
	Bachelor's Degree	107	29.80
	Master's Degree	79	22
	M. Phil/MS	34	9.50
	PhD	16	4.50
Experience of using mobile commerce app	6 months or less	185	51.53
	6-12 months	125	34.82
	12 months or more	49	13.65

4.2 Reliability, Factor Loading, and Validity Analysis

All items' factor loadings exceeded the recommended brink of 0.60 (Chin, 1998; Hair et al., 2011). According to Hair et al., (2005)'s recommendation, the items with low factor loading <0.5 were eliminated. The composite reliability (CR) for all constructs were above 0.60, which is recommended value by Bagozzi & Yi, (1988). Cronbach's alpha values for all items were greater than 0.70, which is an accepted lower limit (Hardy and Bryman, 2009), and the average variance extracted (AVE) values exceeded 0.50 (Kline, 2023). Table 2 demonstrates that all the criteria for achieving convergent validity are satisfied. To assess discriminant validity, as summarized in Table 3, the square root of average variance extracted (AVEs) is significantly greater than their corresponding inter-correlations. Path analysis diagram is presented in fig. 2.

Table 2: Factor loadings and reliability assessments for sample

	Factor loadings
Performance Expectancy (PE) Cronbach's Alpha=.798, AVE=.570, CR=.798	
I find m-commerce app useful in my daily life.	.795
Using m-commerce app increases my chances of achieving things that are important to me.	.688
Using m-commerce app helps me accomplish things more quickly.	.779
Using m-commerce app increases my productivity.	.487*
Effort Expectancy (EE) Cronbach's Alpha=.839, AVE=.674, CR=.892	
Learning how to use m-commerce app is easy for me.	.832
My interaction with m-commerce app is clear and understandable.	.769
I find m-commerce app easy to use.	.839
It is easy for me to become skillful at using m-commerce app.	.840
Social Influence (SI) AVE=.508, CR=.730	
People who are important to me think that I should use m-commerce app.	.622
People who influence my behavior think that I should use m-commerce app.	.822

People whose opinions that I value prefer that I use m-commerce app.	.610
Facilitating Conditions (FC) Cronbach's Alpha=.724, AVE=.544, CR=.827	
I have the resources necessary to use m-commerce app.	.711
I have the knowledge necessary to use m-commerce app.	.785
M-commerce app is compatible with other technologies I use.	.701
I can get help from others when I have difficulties using m-commerce app.	.750
Hedonic Motivation (HM) Cronbach's Alpha=.704, AVE=.508, CR=.754	
Using m-commerce app is fun.	.770
Using m-commerce app is enjoyable.	.744
Using m-commerce app is very entertaining.	.613
Habit (H) Cronbach's Alpha=.756, AVE=.602, CR=.747	
The use of m-commerce app has become a habit for me.	.490*
I am addicted to using m-commerce app.	.877
I must use m-commerce app.	.658
Using m-commerce app has become natural to me.	.458*
Price Value (PV) Cronbach's Alpha=.757, AVE=.585, CR=.808	
M-commerce app is reasonably priced.	.856
M-commerce app is a good value for the money.	.849
At the current price, m-commerce app provides a good value.	.755
Perceived Privacy (PP) Cronbach's Alpha=.761, AVE=.59, CR=.80	
I feel I have enough privacy when I use m-commerce apps.	.719
I am comfortable with the amount of privacy I have when using m-commerce apps.	.766
I think my online privacy is preserved when I use m-commerce apps.	.807
Behavior Intention (BI) Cronbach's Alpha=.758, AVE=.673, CR=.861	
I intend to continue using m-commerce apps in the future.	.786
I will always try to use m-commerce apps in my daily life.	.841
I plan to continue to use m-commerce apps frequently.	.834
Use Intention (UI) Cronbach's Alpha=.771, AVE=.591, CR=.851	

I regularly use m-commerce apps.
.763
M-commerce app usage is a pleasant experience. .636
I currently use m-commerce app as a supporting tool.
.845
I spend a lot of time on m-commerce apps.
.814

*Items were deleted from final analysis

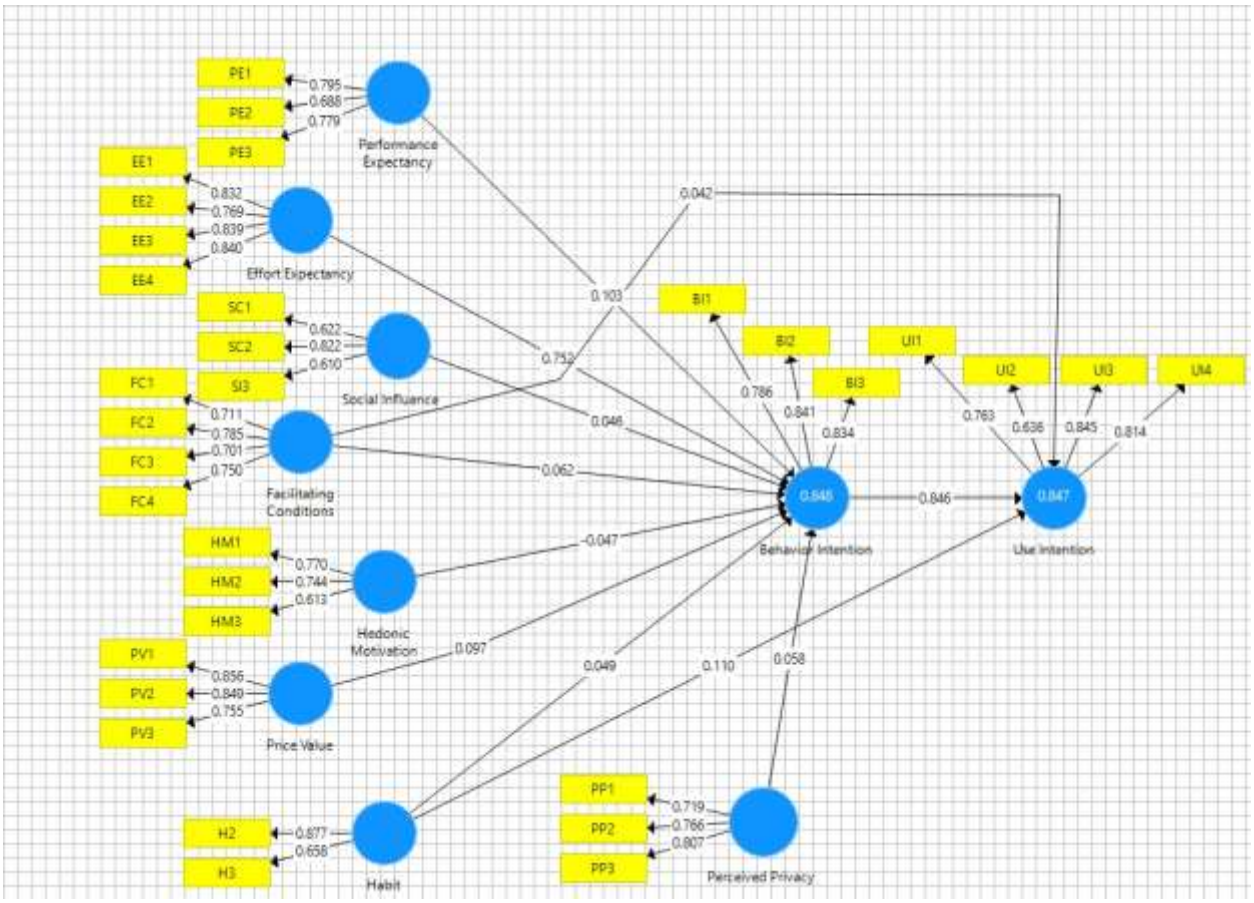

Fig. 2 PLS Algorithm results

Table 3: Discriminant validity

Constructs	BI	EE	FC	H	HM	PE	PP	PV	SI	UI
BI	0.821									
EE	0.905	0.821								
FC	0.508	0.490	0.738							
H	0.431	0.388	0.220	0.776						

HM	0.191	0.229	0.157	0.193	0.712					
PE	0.629	0.595	0.328	0.490	0.191	0.755				
PP	-0.262	-0.304	-0.208	-0.189	-0.053	-0.286	0.765			
PV	0.652	0.637	0.466	0.379	0.237	0.524	-0.370	0.821		
SI	0.237	0.200	0.149	0.208	0.134	0.190	-0.116	0.152	0.692	
UI	0.915	0.858	0.496	0.484	0.207	0.699	-0.297	0.660	0.217	0.769

Notes: PE: performance expectancy; EE: effort expectancy; SI: social influence; FC: facilitating conditions; HM: hedonic motivation; H: habit; PV: price value; PR: perceived privacy; BI: behavioral intention; UB: use behavior. Diagonal elements (bold) are the square root of the AVE for each construct; Off-diagonal factors correspond to construct inter-correlations

4.3 Analysis of the Structural Model

The adequacy of the structural model in PLS-SEM was evaluated on the basis of various criteria namely: (a) the level of significance of path coefficients, (b) the coefficient of determination (R2), and (c) predictive relevance Q2 value of the path model (Hair et al., 2012). The bootstrap re-sampling procedure with 5000 samples for the 359 cases with no sign changes was applied to evaluate the statistical significance of path coefficients. The PLS algorithm was used to obtain coefficient size. Table 4 shows the findings from the hypotheses testing.

Table 4: Results of UTAUT 2

Directional Paths	UTAUT2	
	β	t-value
Behavior intention → Use intention of m-commerce apps	0.846*	45.954
Effort expectancy → Behavior intention	0.752*	31.670
Facilitating conditions → Behavior intention	0.062**	3.120
Facilitating conditions → Use intention of m-commerce apps	0.042***	2.058
Habit → Behavior intention	0.049***	2.253
Habit → Use intention of m-commerce apps	0.110*	4.722
Hedonic motivation → Behavior intention	-0.047***	2.248
Performance expectancy → Behavior intention	0.103*	3.777

Perceived privacy → Behavior intention 2.881	0.058**
Price value → Behavior intention 3.475	0.097*
Social influence → Behavior intention 2.310	0.046***

	R^2 on BI	R^2 on UI
Base Model	0.845	0.846
	Q^2 on BI	Q^2 on UI
Predictive Relevance of the endogenous latent Constructs	0.45	0.58

Notes: * p < 0.05, **p < 0.01, ***p < 0.001, N = 359.

Bootstrapping results are presented in fig. 3. The results put forward that behavioral intention to use mobile commerce apps was significantly influenced by the UTAUT 2 exogenous constructs. Performance expectancy (b = 0.103, p < 0.001), effort expectancy (b = 0.752, p < 0.01), social influence (b = 0.046, p < 0.05), facilitating conditions (b = 0.062, p < 0.01), price value (b = 0.097, p < 0.001), habit (b = 0.049, p < 0.05) and perceived privacy (b = 0.058, p < 0.01) have been reported to have a significant influence on behavioral intention to use m-commerce apps. On the contrary, hedonic motivation (b = -0.047, p < 0.05) has a negative effect on behavioral intention to use m-commerce apps. As predicted, use behavior/intention (UI) of m-commerce apps was significantly affected by behavioral intention (b = 0.846, p < 0.001). Moreover, direct effects of facilitating conditions (b = 0.042, p < 0.05), and habit (b = 0.110, p < 0.001) were all significant. These results suggest that H1, H2, H3, H4a, H4b, H5, H6, H7, H7B, H8 and H9 were supported, whereas H5 was not supported in this study (see Fig.3).

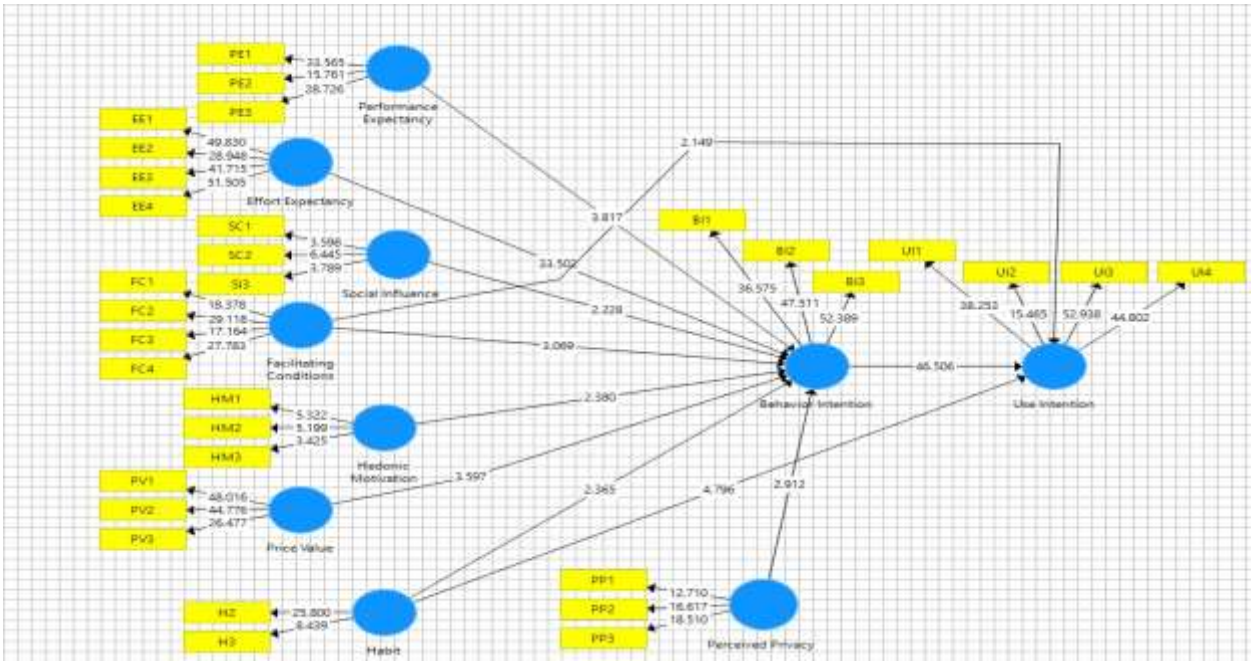

Fig.3 Bootstrapping

4.4 Variance explained, predictive relevance and effect size

The results reveal that 56 percent of the variation in behavioral intention to use m-commerce apps is explained by the constructs performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, habit, and perceived privacy. Furthermore, 48 percent of the variation in use behavior of m-commerce apps is explained by the various constructs behavioral intention, facilitating conditions, and habit. Consequently, this study confirms that UTAUT2 is applicable in m-commerce apps context. Literature suggests R2 - values of 0.67 as substantial, 0.33 as moderate and 0.19 as weak for model's predictive power assessment (Chin, 1998). The research model substantially explains variations in behavioral intention and use behavior of m-commerce apps based on the previous mentioned assumptions. This study applied the cross-validated redundancy measures of Q2 for evaluating the predictive power of our 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 high predictive relevance as with the recommended edge (Hair et al., 2012). Therefore, the research model has strong predictive power in clarifying behavioral intention to use m-commerce apps and the use behavior.

5. Discussion and Implications

The objective of the current study was to examine various factors that influence consumer's behavioral intention and use intention of mobile commerce apps. The UTAUT2 model was used and extended with the addition of construct of perceived privacy to investigate adoption and use of mobile commerce apps in Pakistan. Based on the results of the hypothesis testing, this study provides theoretical and managerial insights into m-commerce apps adoption and use. We outline these findings in the sections that follow.

5.1 Findings

The results demonstrate that the UTAUT2 model provides an exemplary predictive power for Pakistan: with the addition of the perceived privacy construct, it explains 56% of variance in behavioral intention and 48% of variance of Use Behavior regarding m-commerce apps. Apart from hedonic motivation, all the constructs related to UTAUT2 were found to be significant drivers of behavioral intention. Effort expectancy had the strongest influence on behavioral intention to use m-commerce apps reconfirming the results of Hébert et al., (2012), followed by performance expectancy and price value. Results of this study confirms behavioral intention has the strongest correlation with use behavior of m-commerce apps followed by habit and facilitating conditions.

However, the results of the study indicate that hedonic motivation negatively affects the adoption intention to use m-commerce apps. It can be understood that means users of the m-commerce apps would consider to use depending on the performance expectancy and price factors. In addition, hedonic motivation results in this study show that users install m-commerce apps just for formality. The results of this study are supported by research from Mansyur & Ali, (2022), Thaker et al., (2021) which states that hedonic motivation do not have a significant positive effect on behavior intention for using Fintech adoption in Indonesia and mobile banking in Malaysia respectively.

The study also extends the existing research on m-commerce by integrating perceived privacy as an independent variable to capture the underlying forces of the conceptual model. The results of the study highlight that m-commerce app information content which help develop user

attitude toward m-commerce significantly impacts the behavior intention of users to adopt m-commerce apps. Findings of this study are supported by information system and marketing literature which views privacy as one of the most important issues in a technology based environment (Miyazaki and Krishnamurthy, 2002). Users' with low information about apps may be more sensitive about their private information, have more privacy concern, and, therefore, need greater assurances that their personal information will be treated with confidentiality and security.

5.2 Implications

This study has theoretical implications that it suggests that UTAUT2 can adequately explain the behavioral intention and use of mobile commerce apps in cross-cultural settings. Considering that UTAUT2 is a measure that has been validated in developed economies like the USA, UK, and Germany, and the fact that it shows consistency in an emerging market context as that of Pakistan, helping in our understanding of consumer behavior research in an emerging country using instruments developed in different contexts (Hoppner & Griffith, 2015). While prior research has addressed m-commerce apps acceptance and use in general, this has not explicitly done in the context of Pakistan. Moreover, this study extends the applicability of UTAUT2 by integrating perceived privacy into the base model, the study observed their effect on the intention and use of m-commerce apps.

This study provides insights for retailers, marketers and app developers. As reported in results, effort expectancy had a significant impact on the behavioral intention to use m-commerce apps. Therefore, app developers should focus in designing the user interface to be convenient and easy to navigate. App developers should make the m-commerce apps simple and easy to use so that users can find and order goods and services requiring a minimum level of mental and physical effort. Use of local language in designing the app may also increase the usability of the app and its adoption by users. Moreover, performance expectancy has the second strongest influence on the intention to use m-shopping apps in this study. As a result, online marketers and app developers should emphasize on providing newer and better functionalities on their m-commerce apps making it more convenient, fast and useful for consumers.

Since mobile commerce adoption is in an early stage in Pakistan, hedonic motivation inversely impacts users' intention to adopt. To reduce the barriers exercised, retailers and other stakeholders should provide better higher levels of engagement and enjoyment. Even if using m-commerce apps is considered as a personal activity by its users and not as a social activity, interface designers should not ignore social influence and promote social interaction among users integrating social media platforms with apps. The findings of this study validate our research framework based on UTAUT 2 and provide several guidelines for practitioners in Pakistan to develop successful marketing strategies to enhance adoption and use of mobile shopping apps.

6. Conclusions limitations and future research

This study has successfully applied the UTAUT2 as a base model to investigate the several factors that influence behavioral intention and use of m-commerce apps. Perceived privacy factor as a barrier to use of m-commerce apps has been examined along with the other UTAUT2 constructs, thus providing more predictive power to the model. All stakeholders of m-commerce apps will get valuable insights from this study findings, particularly app developers who observe cultural issues for app localization. In addition, the current study has some limitations which could be addressed in future research. Since convenience sampling was used, future

research should target a probability sampling for more generalization. Secondly, the study is based on cross-sectional approach, which is time-dependent so future studies should consider longitudinal approach to will allow capturing the change in consumer's perception and behavior over time, thus yielding useful insight on the topic. Regarding directions for future research, other factors that affect online consumer behaviors need to be analyzed, e.g., security, gender differences, internet habits, consumer experience. Moreover, the drivers and barriers to diverse types of m-commerce apps are different; is another research area which will be appealing for future studies.

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Appendix A

Construct	Item Code	Items	Source

Performance Expectancy (PE)	PE1	I find m-commerce app useful in my daily life.	Venkatesh et al., (2012)
	PE2	Using m-commerce app increases my chances of achieving things that are important to me.	
	PE3	Using m-commerce app helps me accomplish things more quickly.	
	PE4	Using m-commerce app increases my productivity.	
Effort Expectancy (EE)	EE1	Learning how to use m-commerce app is easy for me.	Venkatesh et al., (2012)
	EE2	My interaction with m-commerce app is clear and understandable.	
	EE3	I find m-commerce app easy to use.	
	EE4	It is easy for me to become skillful at using m-commerce app.	
Social Influence(SI)	SI1	People who are important to me think that I should use m-commerce app.	Venkatesh et al., (2012)
	SI2	People who influence my behavior think that I should use m-commerce app.	
	SI3	People whose opinions that I value prefer that I use m-commerce app	
Facilitating Conditions (FC)	FC1	I have the resources necessary to use m-commerce app.	Venkatesh et al., (2012)
	FC2	I have the knowledge necessary to use m-commerce app.	
	FC3	M-commerce app is compatible with other technologies I use.	
	FC4	I can get help from others when I have difficulties using m-commerce app.	
Hedonic Motivation (HM)	HM1	Using m-commerce app is fun.	Venkatesh et al., (2012)
	HM2	Using m-commerce app is enjoyable.	
	HM3	Using m-commerce app is very entertaining.	
Habit(H)	H1	The use of m-commerce app has become a habit for me.	Venkatesh et al., (2012)
	H2	I am addicted to using m-commerce app.	
	H3	I must use m-commerce app.	
	H4	Using m-commerce app has become natural to me.	
Price Value(PV)	PV1	M-commerce app is reasonably priced.	Venkatesh et al., (2012)
	PV2	M-commerce app is a good value for the money.	
	PV3	At the current price, m-commerce app provides a good value.	
Perceived Privacy(PP)	PP1	I feel I have enough privacy when I use m-commerce apps.	Chellappa, (2008)
	PP2	I am comfortable with the amount of privacy I have when using m-commerce apps.	
	PP3	I think my online privacy is preserved when I use m-commerce apps.	
Behavior Intention(BI)	BI1	I intend to continue using m-commerce apps in the future.	Venkatesh et al., (2012)
	BI2	I will always try to use m-commerce apps in my daily life.	
	BI3	I plan to continue to use m-commerce apps frequently	
Use Intention (UI)	UI1	I regularly use m-commerce apps.	Venkatesh et al., (2003)
	UI2	M-commerce app usage is a pleasant experience.	
	UI3	I currently use m-commerce app as a supporting tool.	
	UI4	I spend a lot of time on m-commerce apps.	