

The moderating role of gamification toward intentions to use mobile payments applications in Bahrain: an integrated approach

Intentions to use mobile payments application

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Abstract

Purpose – Using an integrated theoretical model, this study aims to examine the moderating role of gamification in influencing intentions to use mobile payment applications in Bahrain.

Design/methodology/approach – The current examination happens to be the first approximation in the context of Bahrain wherein an extended TPB-based model integrating variables from TAM and UTAUT2 is used along with gamification and situational influence to examine the intentions to use m-payment applications.

Findings – The findings revealed that among the variates of the TPB, AT and PB significantly affect the intentions (IN) to use m-payment applications in Bahrain, but SN fails to affect intentions, similarly SI also fails to affect intentions thereby proving that the pandemic fails to drive the intention of the population under study toward using m-payment applications. However, when the application offers gamification (GM) features, SI significantly affects intentions through GM, thus experience along with situation drives intentions and this becomes the major theoretical contribution of the study.

Practical implications – This examination offers useful practical implications in the form of the findings revealing that GM affects intentions to use m-payment applications and that GM moderates the relationship between perceived risk (PR) and IN, as well as SI and IN, which can be used by the service providers to improve the user experience and achieve better acceptance of their application.

Originality/value – The novelty of the study lies in testing the integrated theoretical model in the context of a GCC nation, Bahrain.

Keywords Extended TPB, TAM, UTAUT2, Integrated, Gamification, Situation, m-payment applications, Bahrain, SEM

Paper type Research paper

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1. Introduction

The rapid advancement of technology is continuously pushing service providers and consumers toward digitization. On the other hand, for a considerable amount of time, governments of various nations have consistently regulated and formulated policies to bring individuals from various regions of the nation under the umbrella of financial inclusion. In this regard, the emergence of communication technology enables the government to achieve its goals more quickly and reach even the most distant citizens (Klapper and Miller, 2021). In addition, the recent pandemic has affected virtually everyone and everything on the planet. Rouf *et al.* (2022) and Almekhlafy (2020) report that the ongoing pandemic has accelerated the digitization of financial services.

Remittances, merchant payments, savings, insurance, etc. are being dramatically transferred from physical mode to electronic mode, with the Internet, communication technology and smartphones playing a crucial role in reaching the most remote individuals. The ongoing pandemic also provided more opportunities for digital platform services and brought individuals under financial inclusion in a short amount of time since the individuals had no option due to lockdown and social distance laws. Additionally, it is beneficial for the users due to low costs, less time required and data encryption (Klapper and Miller, 2021).

The current study uses the theory of planned behavior (Ajzen, 1991), the technology acceptance model, Bauer's risk-taking in consumer behavior and the gamification effect (Davis, 1989; Bauer, 1967; Zichermann and Cunningham, 2011) and intends to investigate individuals' intentions toward m-payment usage. The existing literature on intention to use m-payment applications reveals a number of variables that influence intentions, including perceived usefulness, perceived risk, situational influence, attitude, subjective norms and perceived behavioral control. Hossain (2019), and Yiu *et al.* (2007) found that perceived usefulness and risk are significant predictors of Internet banking services. Davis (1989) defined perceived efficacy as the degree to which an individual believes that employing a particular system will enhance performance. Users intend to use m-payment applications, making it pertinent to investigate how the perceived utility of a service affects their intention to use that service. Bauer (1967) brought the issue of perceived risk through two factors: uncertainty and potential negative outcomes associated with the purchase or consumption decision to illustrate how perceived risk can influence an individual's intention to use. This necessitates an understanding of how perceived risk influences individuals' intention to use, particularly in the case of m-payment usage, where cyber risk is always assumed to be high.

Further, the current examination also tries to determine how gamification moderates the impact of perceived utility, attitude, subjective norms, perceived behavioral control and situational influence on the intention to use m-payment applications. Gamification is the application of game elements in non-game contexts (Zichermann and Cunningham, 2011). It relates to the characters, visuals, scripts, points and rewards that comprise the essence of gamified systems' artistic design. The purpose of gamifying payment applications is to entice and motivate users to utilize the applications. Moreover, due to the pandemic, the world has experienced dramatic changes over the past three years. It, therefore, encourages post-pandemic research into how situational influence affects individuals' intent to use m-payment applications.

Among the countries of the Middle East, Bahrain is a significant market for e-wallets, with 51.7 million transactions valued at BD 2.4 billion in 2020. Second, the nation's financial system is steadily advancing toward digitization. Multiple fintech applications and payment systems are inundating the nation's financial system, and efforts are being made to create a cashless economy. This makes it a fascinating region to research. Research in the Gulf Cooperation Council (GCC) nations, including Bahrain, has emphasized the significance of comprehending user intentions and attitudes regarding mobile payment applications. According to a study by Alalwan *et al.* (2017), perceived usefulness, simplicity of use and

security are the most significant factors influencing the adoption of mobile payment applications in the GCC countries. [Alalwan et al. \(2018\)](#) identified trust, perceived risk and social influence as significant factors that influence the adoption of mobile payment applications.

Gamification has been identified as a potential strategy to increase user engagement and motivation toward mobile payment applications in the GCC region. A study by [Al-Adwan and Al-Majali \(2018\)](#) in Jordan found that gamification positively influenced user attitudes toward mobile payment applications. Similarly, a study by [Alshurideh et al. \(2019\)](#) in the UAE found that gamification elements increased user motivation and adoption of mobile payment applications.

In Bahrain, there is limited research specifically examining the moderating role of gamification in affecting intentions to use mobile payment applications. Despite the potential benefits of gamification in increasing user engagement and adoption of mobile payment applications, there is still a research gap in understanding the moderating role of gamification in influencing intentions to use mobile payment applications in Bahrain. Additionally, there is a need to identify which gamification strategies are most effective in promoting user engagement and the adoption of mobile payment applications in Bahrain.

Based on the above discussion, the present study aims to offer an integrated framework based on the TPB, TAM and UTAUT2 to examine intentions to use m-payment applications in Bahrain. The integration of the Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) can provide a comprehensive framework for examining the intentions to use mobile payment applications in Bahrain. TPB provides a basis for understanding the factors that influence an individual's behavioral intentions, including attitudes, subjective norms and perceived behavioral control. TAM focuses on the factors that affect the acceptance and use of technology. UTAUT2 expands TAM and includes additional factors such as social influence ([Venkatesh et al., 2012](#)). By integrating these three models, researchers can gain a more comprehensive understanding of the determinants of mobile payment adoption and usage.

Thus, the current examination tries to answer the following research question.

RQ1. The impact of chosen variables on the individuals' intention to use m-payment applications and how gamification moderates the relationship between them in the context of Bahrain.

The outcomes of the study can be helpful to service providers, policymakers and researchers in the further investigation of existing literature or service improvement. The results can be useful to other Middle Eastern nations that have a similar cultural and economic system.

2. Literature review

TPB, TAM and UTAUT2 are based on the theory of reasoned action ([Ajzen and Fishbein, 1980](#); [Hill et al., 1977](#)); they also assume that the most important factor influencing behavior is intention ([Paul et al., 2016](#)). In the case of technological items, researchers have claimed that intentions can be a good predictor of actual behavior ([Shin, 2009](#)). TAM is a key concept in information system management that explains how people adopt and use new technology ([Legris et al., 2003](#)). According to TAM, a person's behavioral purpose determines his or her true conduct ([Davis, 1989](#)). The theories integrated into the current examination are widely used for evaluating the consumer acceptability of any internet-based technology ([Shankar and Kumari, 2019](#); [Chen and Tung, 2014](#)). By adding other variables to TAM, several researchers have been able to construct novel models ([Galib et al., 2018](#); [Arora and Sahney, 2019](#)). In recent times, the emerging trend of gamification and the impact of pandemics have

had an impact on human behavior. In this respect, it becomes imperative to understand how these can further influence behavioral intentions, and the same is the core strength of the present study model. In addition, there is still not enough evidence in the existing literature when it comes to using an integrated model inclusive of gamification and situational influence (pandemic influence) to examine intentions to use m-payment applications in the Gulf region. During and post-pandemic, the usage of mobile banking has been raised due to social distance and digital adoption, specifically in the context of geolocation, where the majority are ex-pats and have a higher income level; hence, the proposed model (Figure 1) can bring useful knowledge for researchers and policymakers.

2.1 Perceived usefulness (PU)

Perceived Usefulness (PU) is a measure of how strongly consumers believe that implementing a specific piece of technology would improve their lives (Davis, 1989). According to empirical evidence, PU is an important predictor of intentions to use new technologies in the future (Arvidsson, 2014). With respect to mobile payment systems, PU refers to the ease and speed with which transactions may be completed, as well as the fact that they are complementary to cash transactions (Chen *et al.*, 2018). To add to this, according to Taylor and Todd (1995), perceived usefulness (PU) was a significant antecedent in distinguishing the differences between users and non-users. Liébana-Cabanillas *et al.* (2014) conducted an empirical study in which they discovered that PU was a powerful predictor of the behavioral intention to utilize mobile payment services. In recent studies, Kavitha and Kannan (2020) confirm that perceived usefulness has a significant impact on consumers' attitudes toward mobile applications. Another study that corroborated the same impact discovered that perceived usefulness significantly influences customers' intentions to use mobile payments (Denaputri

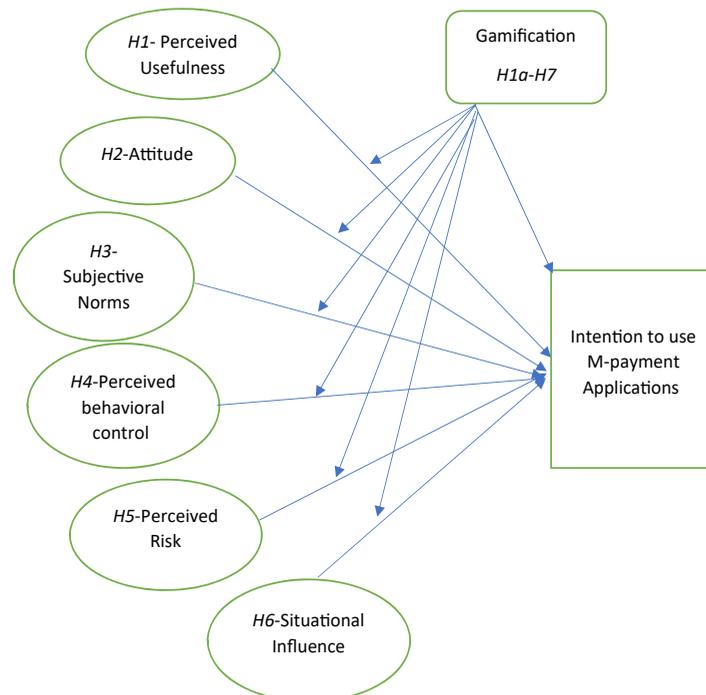


Figure 1. Authors' proposed model

and Usman, 2019). A recent study mentioned that perceived usefulness is the most crucial indicator of future intention to utilize mobile payments (Franque *et al.*, 2021). Thus, it would be interesting to examine how it works in the current model.

H1. Perceived Usefulness positively affects intentions to use m-payment applications among users in Bahrain.

2.2 Attitude (AT)

Whether they are positive or negative, people's responses to particular conduct have an impact on their attitudes (Fishbein and Ajzen, 1975). Attitude is thought to be a complex mix of behavior, thinking and feeling (de Luna *et al.*, 2018). When it comes to technology adoption, the TAM (Davis, 1989) and the TPB (Ajzen, 1991) both consider attitude to be a significant factor. Attitude has also been identified as a common element influencing the uptake of mobile payment services (de Luna *et al.*, 2018; Liebana-Cabanillas *et al.*, 2014). According to studies by Gupta and Arora (2017) and Wulandari (2017), attitude toward mobile payment services have a positive effect on their acceptance. Safari *et al.* (2022) proposed a similar association in the case of new payment systems, which is consistent with earlier research. There are significant positive relationships between tourists' attitudes regarding augmented reality technology and their intentions to use it (Zhuang *et al.*, 2021). The relationship between attitude and intent to use is both positive and substantial (Hussein *et al.*, 2017). Similar findings may have an impact on mobile payment apps as well, according to another study (Hossain *et al.*, 2019) that found that people with a positive outlook on information systems might show more interest if they have a positive outlook on learning about mHealth apps. Hence, attitude forms a critical aspect of the current model under study to examine how attitude affects intention to use the m-payment applications in Bahrain.

H2. Attitude positively affects intentions to use m-payment applications among users in Bahrain.

2.3 Subjective norms (SN)

Subjective norms (SN) refer to the perceived social pressures that individuals feel from certain significant referents in their lives, such as families, friends and anyone else who is related to them, to engage in specific conduct (Ajzen, 1991). Studies have found that the SN is an important factor in the adoption of technology-based services, and it has been used in TAM-based models (Chong *et al.*, 2012; Venkatesh and Davis, 2000). As Davis (1989) stated, the concept of social influence is linked to the concept of subjective norms. de Luna *et al.* (2018) and Zhou (2011), concurred with this conclusion.

Adoption studies of digital payments (Dahlberg *et al.*, 2015) have found that subjective norms are one of the most frequently studied variables among participants in relation to intentions to use. Subjective norms have been found to be an important indicator of intentions toward social media for learning and investments (Al Kurdi *et al.*, 2021; Shahzamal and Adnan, 2022; Akhtar *et al.*, 2023). Therefore, the model under examination also examines the relationship between SN and intentions to use m-payment applications in the context of Bahrain.

H3. Subjective Norms positively affect intentions to use m-payment applications among users in Bahrain.

2.4 Perceived behavioral control (PB)

Perceived behavioral control (PB) is a measure of how easy or difficult it is to carry out a behavior (Ajzen, 1991). According to past research, the notion that one has control over one's

behavior is a crucial influence on the intention of customers to make online purchases (Ting *et al.*, 2016; Khatimah and Halim, 2016). When it comes to deciding, PB has a major impact on the outcome (Albayrak *et al.*, 2013; Moser, 2015; Paul *et al.*, 2016). Using mobile payment services, users' expressions of displeasure are predicted by their perceptions of behavioral control, suggesting a positive influence on behavioral intention (Dorfleitner *et al.*, 2017). Hence, the authors included PB as a variable under examination in the current model.

H4. Perceived Behavioral Control positively affects intentions to use m-payment applications among users in Bahrain.

2.5 Perceived risk (PR)

In the context of an innovative product, perceived risk (PR) is described as the degree of ambiguity among customers about the potential negative repercussions of utilizing new technology, which may discourage adoption (Bauer, 1967). This suggests that growing unpredictability will raise the risk perception of m-payment users. Using the example of Schierz *et al.* (2010), who observed that customers are less likely to use mobile wallets if they perceive a higher risk of failure, PR is thought to be very important when people are not sure how to use new technology because they are afraid of what could happen when they use it. According to Esawe (2022), perceived risk has a significant impact on retailers' behavioral intentions to use mobile payments. Another study found a negative impact of PR on millennials' attitudes toward using m-payment (Zhu *et al.*, 2022). The previous evidence of interaction between PR and intention to use mobile payments makes it imperative to include PR as an important predictor in the current model.

H5. Perceived Risk positively affects intentions to use m-payment applications among users in Bahrain.

2.6 Situational influence (SI)

In the short term, conditions that have an impact on how customers act—whether they buy a product or something else or do nothing at all—are referred to as “situational factors” (Ross and Robertson, 2003). Previous research has suggested that situational factors play an important influence on choice when it comes to a wide range of issues (Wallenius *et al.*, 2014). Entrepreneurship and innovation experts suggest that situational factors have a significant influence on the intentions of entrepreneurs (Liñán *et al.*, 2011). Previous research examinations have revealed that SARS-nCOV and related virus-like influenza can also infect the paper surface (van Doremalen *et al.*, 2020). This has also affected individual behavior, and it is also backed by research, like the outcomes of a recent investigation, which demonstrated that the COVID-19-induced scenario had a significant impact on the online book purchase behavior of customers in Vietnam (Nguyen *et al.*, 2020). Situational influence is one of the factors that positively affect intentions to use mobile payment applications (Maleki and Hosseini, 2020). Thus, situational influence has gained prominence as a variable to investigate intentions to use during the pandemic; hence, it also forms a prominent part of the model under examination.

H6. Situational Influence positively affects intentions to use m-payment applications among users in Bahrain.

2.7 Gamification (GM)

Gamification is the application of game design concepts in non-gaming situations (Deterding *et al.*, 2011). Motivation and engagement, the two most studied gamification concepts, both influence usage behaviors (Koivisto and Hamari, 2019; Liu *et al.*, 2017).

According to [Landers et al. \(2018\)](#), gamification research should be conducted to better understand “how to best affect human behavior, attitudes and other states with tailored treatments derived from games.” Furthermore, the existing literature in the field indicates that gamification has a positive influence on users’ intentions by allowing them to participate in activities that they find pleasurable ([Lee and Jin, 2019](#)). The findings demonstrated that gamification boosts user engagement by meeting their demands for relatedness, competence and autonomy. User involvement, in turn, increases the intention to use ([Bitrián et al., 2021](#)). A systematic review of recent studies found positive outcomes from their analysis showing that gamification can influence intention to use ([Fang, 2019](#)). Thus, the current examination utilizes gamification as the moderating variable to test how the variables in the model interact with gamification to boost users’ intentions to use m-payment applications in Bahrain. Thus, the hypotheses to be tested are framed as follows.

- H1a.* Gamification positively moderates the relationship between Perceived Usefulness and intentions to use m-payment applications among users in Bahrain.
- H2a.* Gamification positively moderates the relationship between Attitude and intentions to use m-payment applications among users in Bahrain.
- H3a.* Gamification positively moderates the relationship between Subjective Norms and intentions to use m-payment applications among users in Bahrain.
- H4a.* Gamification positively moderates the relationship between Perceived Behavioral Control and intentions to use m-payment applications among users in Bahrain.
- H5a.* Gamification positively moderates the relationship between Perceived Risk and intentions to use m-payment applications among users in Bahrain.
- H6a.* Gamification positively moderates the relationship between Situational Influence and intentions to use m-payment applications among users in Bahrain.
- H7.* Gamification positively affects intentions to use m-payment applications among users in Bahrain.

3. Research methodology

3.1 Research design

The current investigation is quantitative in nature. An explanatory-predictive technique is employed in this study to assess statistical inference, path coefficients, size of impact and the model’s predictive skills, as well as any errors in prediction ([Henseler, 2018](#)). The study employs a self-report questionnaire, which is thought to be appropriate for assessing behavioral intentions ([Chan, 2009](#)).

3.2 Sampling procedure

The authors collected 50 questionnaires as a pilot test to ensure satisfactory Cronbach alpha, validity and reliability. In order to ensure that participants represented different age groups, gender, income and educational level, stratified random sampling was used. Google Forms were used to collect data from the participants through social media platforms from November 2021 to January 2022. The authors utilized G* Power 3.1.9.4 software to determine the minimal sample size required for the analysis. At a significance level of 5% (0.05), a sample size of 89 observations was recommended. Despite the restrictions imposed due to the emergence of newer variants of Covid-19, the authors were able to collect 250 duly filled questionnaires, excluding the samples collected for pilot tests. Even after removing the

questionnaires with missing values (45) and the questionnaires collected for the pilot tests (50), the sample size remained at 205, which satisfied the minimum sample size criterion (please refer [Table 1](#)).

4. Analytical procedure

The authors applied the multivariate PLS-SEM in the current examination, which is considered appropriate for analyzing theories and latent variables ([Hair et al., 2017](#)). Moreover, the data collected was not normal ([Henseler et al., 2009](#); [Hair et al., 2019](#)). The model was analyzed through SmartPLS 3.3.3 ([Ringle et al., 2015](#); [Sarstedt et al., 2020](#)).

4.1 Measurement model

The examination utilizes self-appraised questions on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) (please refer [Table 2](#)). The questionnaire was classified into eight different sections; however, the respondents were not informed about the section to which various items belonged. A separate section of respondents' profiles was added during the first round of data collection. All the questions used in the survey were taken from published sources.

4.2 Common method bias

Common method bias is a major concern in all primary data research. During data collection, reverse scaling and mixing of items in the questionnaire were employed ([Osakwe et al., 2016](#)). The authors also conducted Harman's single-factor test, which revealed that one factor explained only 32% of the variation, which is within the threshold, thereby ruling out the possibility of CMB in the data under examination.

5. Results

The authors calculated Cronbach's alpha, Composite Reliability, Rho_A, AVE and HTMT to establish the reliability, convergent and discriminant validity of the variables ([Henseler et al., 2014](#)). The values for Cronbach's alpha and Rho_A were above 0.7 thereby establishing the reliability of the construct through both conservative and modest approaches (please refer [Table 3](#)) ([Hair et al., 2017, 2019](#)).

All the values for AVE reported were above 0.5 which further compliments the reliability and values of HTMT were also found within the threshold to establish the discriminant validity of the constructs (please refer [Table 4](#)) ([Sarstedt et al., 2020](#)).

	N	Minimum	Maximum	Mean	Std. Deviation
Gender	205	1	2	1.365853659	0.482847841
Age group	205	1	5	2.346341463	1.099040928
Partnership status	205	1	3	1.717073171	0.540471127
Level of education	205	1	5	3.180487805	0.919084026
Level of income (Monthly; in Bahraini Dinar)	205	1	5	3.063414634	1.244941942
Employment status	205	1	2	1.824390244	0.381419233
Valid N (listwise)	205				

Table 1.
Descriptive statistics

Source(s): Author-generated content through IBM-SPSS 20

Code	Items	Loadings	VIF	Sources
PU1	Using mobile payment application makes the process of bill payment easier for me	0.830	2.41	Davis (1989)
PU2	In general, mobile payment applications offers too much utility	0.867	2.827	
PU3	Using m-payment application makes me manage my liabilities effectively	0.913	3.45	
PU4	Using mobile payment application saves me time for other important activities	0.872	2.874	
PU5	In today's digital world m-payment application is extremely vital for everyone	0.687	1.743	
ATT2	It's great that such applications are available to use in Bahrain	0.646	1.496	Mostafa Mohamed (2006), Mostafa (2009), Paul <i>et al.</i> (2016), Taylor and Todd (1995)
ATT3	I have a positive attitude toward using mobile payment applications	0.766	2.188	
ATT4	The availability of mobile payments applications is useful for everyone	0.795	2.407	
ATT5	By using mobile payments applications for transactions, I can save time and money	0.799	2.175	
ATT6	I like to explore various mobile payment applications available to use	0.743	2.102	
ATT7	I am able to get various offers on using mobile payment applications	0.625	1.671	
SN1	I know that most people who use mobile payment applications are able to save money and time	0.781	1.862	Arvola <i>et al.</i> (2008), Chen and Peng (2012), Dean <i>et al.</i> (2012), Kim and Ko (2012), Paul <i>et al.</i> (2016)
SN2	People who influence my behavior think that I should use mobile payment applications for transactions	0.705	2.048	
SN3	People who are important to me think that I should use mobile payment applications for transactions	0.859	3.372	
SN4	My friends'/colleagues' positive opinion about mobile payment applications also affect my intentions to use them	0.793	2.253	
SN5	I know that most people close to me approve of using mobile payment applications	0.734	1.839	
SN6	I always follow my family and friends in choosing mobile payment applications	0.736	1.67	
PB1	I feel I have the capability to save time and money through mobile payment applications	0.753	2.051	Armitage and Conner (1999), Chen and Peng (2012), Dean <i>et al.</i> (2012), Kim and Ko (2012), Paul <i>et al.</i> (2016), Pavlou (2003), Taylor and Todd (1995)
PB2	If it is totally up to me when it comes to using mobile payment applications for transactions	0.756	2.362	
PB3	I have amenities, time and access to various mobile payment applications	0.855	2.762	
PB4	I can afford to handle the security issues related with mobile payment applications	0.837	2.658	
PB5	I can avail various offers while making payment through mobile payment applications and thus save money	0.827	2.686	
PB6	Updates and reminders received on mobile payment applications are extremely helpful	0.824	2.084	

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(continued) **Table 2.** Measurement model

PRR

Code	Items	Loadings	VIF	Sources
SI1	Many of the bank branches were closed during Covid-19	0.830	2.249	Nguyen et al. (2020)
SI2	There were significant health risks associated with visiting bank branches and ATMs during Covid-19	0.843	2.536	
SI3	Mobile payment applications gave numerous offers during Covid-19	0.806	2.189	
SI4	Mobile payment applications resort to aggressive sales promotion strategy during Covid-19	0.819	2.572	
SI5	Making and receiving payments using mobile payment applications became a trend during Covid-19	0.746	1.983	
PR1	I am afraid that my personal information may be misused by the service providers	0.809	2.763	Hong and Cha (2013)
PR2	While making a payment I am not sure whether it will succeed or not	0.927	4.715	
PR3	I am worried that if the transaction fails my money would be blocked	0.935	3.572	
PR4	I have heard that mobile payment applications are not safe	0.882	4.238	
PR5	There may be a variation in amount deducted from the bank account and amount actually paid using the m-payment application	0.823	3.194	
GM1	When I use my mobile payment application I feel like playing a game	0.870	2.706	De Canio et al. (2021) , Hsu and Chen (2018)
GM2	The concept of points earned on every transaction makes me feel like completing a stage in a game	0.894	3.529	
GM3	The various steps involved in making payments on the application creates an environment like playing a game	0.877	3.315	
GM5	The challenge involved in making payment each time is similar to gaming experience	0.859	2.68	
IN1	I will consider using mobile payment applications if I have seen my close contacts using it	0.810	2.368	Liébana-Cabanillas et al. (2017) , Teng et al. (2018)
IN2	I will consider using mobile payment applications if I have easy access to Internet	0.829	2.553	
IN3	I will prefer using mobile payment applications if the speed of Internet is good	0.893	3.407	
IN4	I will prefer using mobile payment applications if it ensures sufficient safety	0.849	3.114	
IN5	I will prefer to use a mobile payment application if it is easy and interesting to use	0.843	3.331	
IN6	I will prefer to use mobile payment applications if there are sufficient offers to save money	0.773	2.158	

Table 2.

Source(s): Author calculated values through SmartPLS 3.3.3

6. Assessment of structural model

The assessment of structural model started with the authors calculating the inner VIF values which fell between 1.453 and 2.569 which is within the threshold to signal any collinearity (Ringle *et al.*, 2015). The structural model is analyzed using a two-tailed percentile bootstrapping test with 10,000 sub-samples and a significance threshold of 5% to test the framed hypotheses (Streukens and Leroi-Werelds, 2016).

6.1 Direct relationship

The analysis of the structural model revealed that AT, PB, PR and GM has a positive influence on intentions to use mobile payment applications with a ($\beta = 0.184, f^2 = 0.038, p < 0.05$), ($\beta = 0.536, f^2 = 0.308, p < 0.05$), ($\beta = -0.174, f^2 = 0.077, p < 0.05$) and ($\beta = 0.362, f^2 = 0.033, p < 0.05$) respectively, thereby supporting the H2, H4, H5 and H7. The results are further supported by the t-values which are ($t = 2.433$), ($t = 6.51$), ($t = 1.934$) and ($t = 3.05$) respectively. The outcomes of the analysis also disclosed that PU, SN and SI do not have a positive influence on the intentions to use mobile payment applications with a ($\beta = 0.073, f^2 = 0.024, p > 0.05$), ($\beta = -0.079, f^2 = 0.002, p > 0.05$) and ($\beta = -0.066, f^2 = 0.008, p > 0.05$) respectively. Further, the t-statistics also reveals the same with a ($t = 0.931$), ($t = 0.941$) and ($t = 0.873$) which is below the threshold ($t > 1.96$) (please see Table 5 and Figure 2). Hence, H1, H3 and H6 are rejected.

6.2 Moderating role of gamification

The analysis of the indirect relationship revealed that GM moderates the relationship between PR and IN with ($\beta = 0.15, p < 0.05, t > 1.96$), and between SI and IN with ($\beta = -0.148, p < 0.05, t > 1.96$), hence we have enough evidence to accept H5a, H6a however, the

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
ATT	0.824	0.825	0.873	0.536
GM	0.899	0.91	0.929	0.766
IN	0.912	0.917	0.932	0.695
PB	0.895	0.908	0.919	0.656
PR	0.928	1.102	0.943	0.768
PU	0.894	0.926	0.921	0.702
SI	0.869	0.883	0.904	0.655
SN	0.862	0.868	0.897	0.592

Source(s): Author calculated values through SmartPLS 3.3.3

Table 3.
Construct reliability and validity

	ATT	GM	IN	PB	PR	PU	SI	SN
ATT								
GM	0.415							
IN	0.567	0.439						
PB	0.605	0.54	0.737					
PR	0.26	0.687	0.129	0.309				
PU	0.257	0.318	0.276	0.293	0.54			
SI	0.415	0.526	0.407	0.433	0.474	0.514		
SN	0.761	0.509	0.563	0.794	0.367	0.31	0.4	

Source(s): Author calculated values through SmartPLS 3.3.3

Table 4.
Discriminant validity

Hypotheses		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-statistics (O/STDEV)	p-values	Outcome
H1	PU → IN	0.073	0.086	0.078	0.931	0.352	Rejected
H1a	PU GM IN → IN	0.088	0.088	0.071	1.229	0.219	Rejected
H2	AT → IN	0.184	0.192	0.076	2.433	0.015	Accepted
H2a	AT GM IN → IN	-0.092	-0.068	0.11	0.833	0.405	Rejected
H3	SN → IN	-0.079	-0.082	0.084	0.941	0.347	Rejected
H3a	SN GM IN → IN	0.118	0.113	0.135	0.871	0.384	Rejected
H4	PB → IN	0.536	0.533	0.082	6.51	0	Accepted
H4a	PB GM IN → IN	-0.082	-0.096	0.113	0.729	0.466	Rejected
H5	PR → IN	-0.174	-0.161	0.09	1.934	0.053	Accepted
H5a	PR GM IN → IN	0.15	0.15	0.069	2.178	0.029	Accepted
H6	SI → IN	-0.066	-0.064	0.076	0.873	0.383	Rejected
H6a	SI GM IN → IN	-0.148	-0.152	0.065	2.268	0.023	Accepted
H7	GM → IN	0.362	0.343	0.119	3.05	0.002	Accepted

Note(s): In Table 5, italicized values indicate statistical significance of the relationships examined. Specifically, path coefficients presented in italics are significant at a predetermined level (e.g. $p < 0.05$), implying that there is strong evidence to support the relationships or effects they represent and vice-versa

Source(s): Author calculated values through SmartPLS 3.3.3

Table 5.
Path coefficient

moderating influence of GM on other variables cannot be established during the analysis leading to rejecting of H1a, H2a, H3a and H4a (please see Table 5, Figures 2 and 3).

6.3 R^2

In the next step, the authors analyzed the model's predictive capabilities. Based on the model's R^2 values, the constructs connected to it explain 59.4% of the variation in the dependent variable, which is within the moderate range according to the researchers' criteria (Hair *et al.*, 2019) (please refer Table 6).

6.4 Model fit

The current examination revealed SRMR = 0.082, which is within the threshold to depict a satisfactory model fit (Hu and Bentler, 1998; Clark and Bowles, 2018). Moreover, the values for Chi-square = 2926.126 and NFI = 0.637 also indicated that an acceptable model fit for the study was achieved (please refer Table 7).

7. Discussion and conclusion

The current examination happens to be the first inference in the context of Bahrain, wherein an extended TPB-based model incorporating variables from TAM and UTAUT2 is used along with gamification and situational influence to examine the intentions to use m-payment applications. The findings revealed that among the variants of the TPB, AT and PB significantly affect the intentions to use m-payment applications in Bahrain. This finding adds value to the model, as the previous literature mentions that in the case of technological and innovative products, AT is the key influencer of intentions to use (Chen and Tung, 2014; Moser, 2015). Similarly, with respect to PB, the researchers have argued that it is one of the key influencers when it comes to technological products and services and plays a vital role in the adoption of innovative financial products as well (Albayrak *et al.*, 2013; Paul *et al.*, 2016). Thus, the variables addressed in the model complement previous literature with their outcomes. However, among the variates of the TPB SN, fails to register a significant impact on intentions to use m-payment applications in Bahrain, which is interesting as the researchers have always

Intentions to use mobile payments application

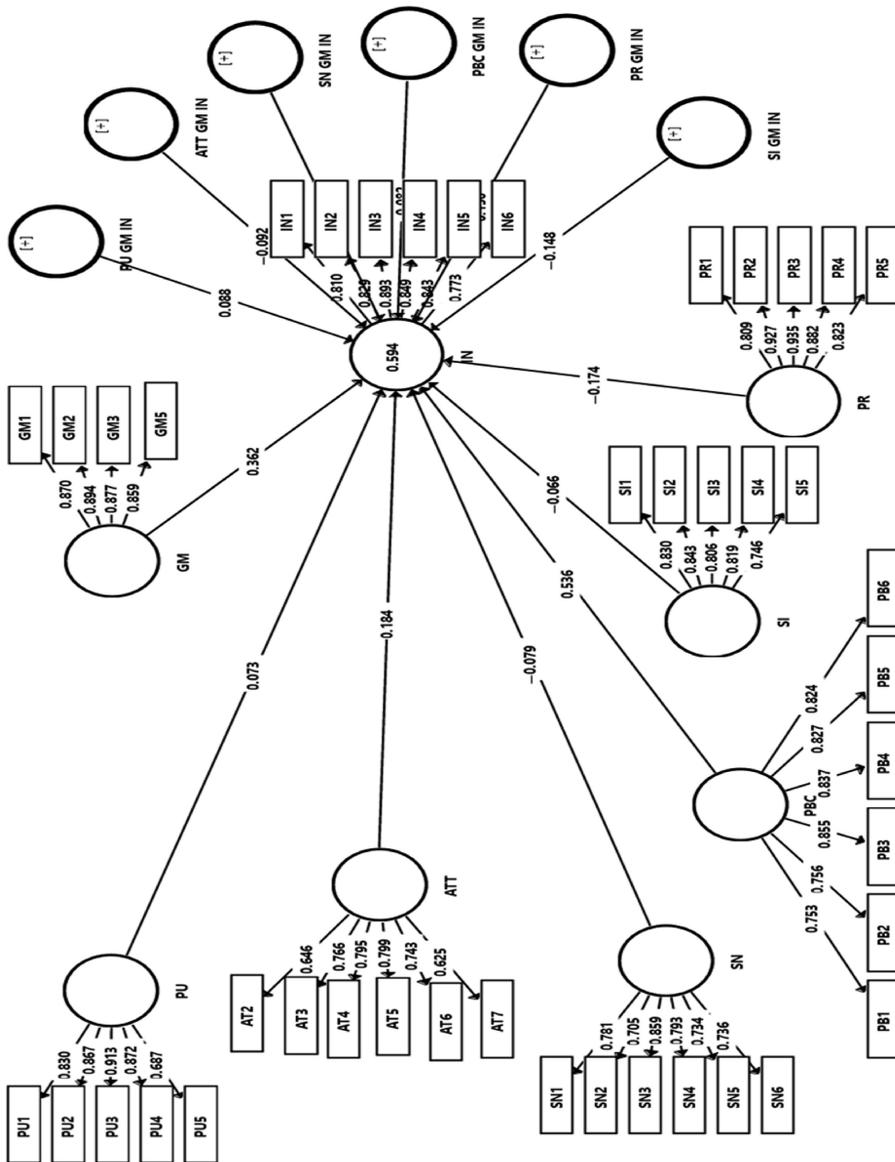


Figure 2. Author generated model through SmartPLS 3.3.3

PRR

argued that in the case of innovative financial products and services, trust is always the key concern and users tend to trust the opinion shared by their close contacts (Moser, 2015). The factor that makes this outcome stand out is the fact that another variable taken from TAM, perceived risk, reflects a significant impact on intentions to use m-payment applications among the population under examination. This may mean that even though the population under examination does not rely much on the opinion of peers, they may be open to professional financial advice as they feel pressure when they are choosing an innovative financial product. However, this can only be addressed in future endeavors.

The findings further revealed that PU fails to impact intentions to use m-payment applications among the users in Bahrain. This is also very vital, as it indicates that the users, even though they have a positive attitude toward the m-payment applications, do not feel that they make a significant value addition to their financial transactions. Thus, the population under examination feels that m-payment applications offer limited utility to them. This conclusion is also backed up by the outcome of SI on intentions to use m-payment applications, which further displayed that situational influence is not affecting intentions to use m-payment applications. Thus, it becomes quite evident that the population under examination does not feel that m-payment offers any additional utility, even during the pandemic.

Gamification (GM), on the other hand, displayed a significant impact on intentions to use m-payment applications, which supports the available literature that claims GM affects user engagement positively (Kuo and Chuang, 2016). GM also moderates the relationship between PR and IN, SI and IN, which explain that gamification strengthens the relationship between these variables, and this outcome is particularly important given that even though SI does not

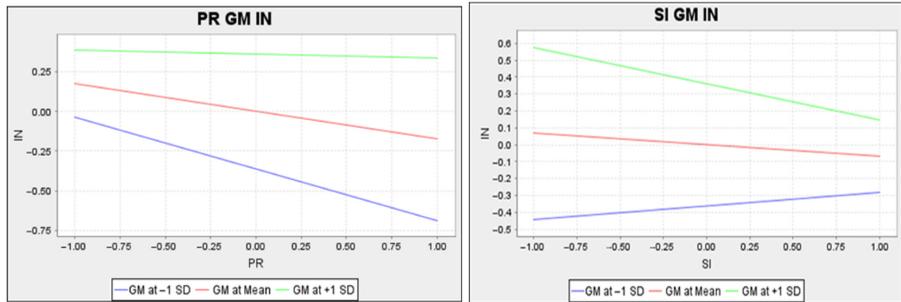


Figure 3.
Simple slope analysis
author generated
model through
SmartPLS 3.3.3

	R Square	R Square Adjusted
IN	0.60	0.594

Source(s): Author calculated values through SmartPLS 3.3.3

Table 6.
 R^2

	Saturated Model	Estimated Model
SRMR	0.082	0.082
d_ULS	6.365	6.365
d_G	2.895	2.895
Chi-Square	2926.126	2926.126
NFI	0.637	0.637

Table 7.
Model fit

Source(s): Author calculated values through SmartPLS 3.3.3

affect the intentions to use, SI, along with the GM, has a significant impact on intentions, thereby offering some crucial practical implications for the service providers. The moderating effect of gamification revealed that when gamification levels are higher, the positive association between consumer intentions to adopt and recommend will be stronger (Rahi and Abd Ghani, 2019). The findings demonstrate mixed results; some of the relationships tested above show a moderate effect, and some do not. Gamification has a considerable impact on the intention to continue using m-payments. The findings give evidence for further exploration, and theoretically, this study adds to the body of knowledge by demonstrating how gamification in payments has a major impact on users' intentions to continue using mobile payments. In order to assure their continued use, the m-payment providers are advised by this research to keep the gamification components.

8. Theoretical contribution

This model offers some important theoretical contributions: one in the form of PR being a significant variable affecting intentions but SN not registering a significant impact; another wherein SI fails to affect intentions as a variable but when moderated by GM it registers a significant impact on intentions. Moreover, the model also shows that PU fails to affect intentions significantly. This means that even though the population under study has trust issues, they do not rely on the information shared by their peers, so they may be inclined toward the opinion of the experts. This finding opens the door for future research on examining the intention to adopt innovative financial products or services through financial advice. Similarly, SI fails to affect intentions, thereby proving that the pandemic fails to drive the population under study toward using m-payment applications, but when the application offers gaming features, SI affects intentions significantly through GM; thus, experience along with the situation drives their intentions, and this becomes the major contribution of the model. Moreover, the fact that PU fails to drive intention toward m-payment applications would mean that users do not feel that m-payment applications offer any utility to them, which further substantiates the need for financial literacy and financial advice. Precisely, the major theoretical contribution is the moderating role of gamification, which was not covered comprehensively in the existing literature. Therefore, the present article enriches the current literature and opens avenues for further research.

9. Practical implications

This study also offers useful implications for service providers, who can use the outcomes of the study to their advantage. The findings revealed that GM affects intentions to use m-payment applications and that GM moderates the relationship between PR and IN, as well as SI and IN, which can be used by the service providers to provide an improved gaming experience and achieve better acceptance of their application. Further, the service providers may also use the gaming environment of the applications to create educational materials for the customers so that they can better understand the utility of the applications and participate in a better way. Since the outcomes also revealed that AT has a significant impact on intentions to use m-payment applications, service providers may design promotional campaigns utilizing a gaming environment so that a sustainable customer base for such applications can be created in Bahrain and the objectives of the digital economy can be achieved in a better way. In short, the application of gamification can be useful for telecom companies, banking firms and other online services to attract, serve and retain users and customers. Also, to reach and retain the remotest customers where there are no physical branches of services available, gamification can play an important role in customer relationship management and building customer loyalty as well.

10. Limitations

The current examination also suffers from certain limitations. It would be desirable to use the model among a considerably large population chosen from different countries in the MENA region in order to generalize the findings. Moreover, multigroup analysis can be performed in order to understand the differences among groups created using demographic indicators.

References

- Ajzen, I. (1991), "The theory of planned behavior ICEK", *Organizational Behavior and Human Decision Processes*, Vol. 50 No. 2, pp. 179-207, available at: <http://www.jsad.com/doi/10.15288/jsad.2011.72.322>
- Ajzen, I. and Fishbein, M. (1980), *Understanding Attitudes and Predicting Social Behavior*, Englewood Cliffs: Prentice-Hall.
- Akhtar, M.A., Khan, K.A. and Hoang, H.C. (2023), "Role of social networking sites in financial product choice: an investigation through the theory of planned behavior", *Business Perspectives and Research*, Vol. 11 No. 1, pp. 44-62, doi: [10.1177/22785337211070342](https://doi.org/10.1177/22785337211070342).
- Al Kurdi, B., Alshurideh, M., Nuseir, M., Aburayya, A. and Salloum, S.A. (2021), "The effects of subjective norm on the intention to use social media networks: an exploratory study using PLS-SEM and machine learning approach", *Advances in Intelligent Systems and Computing*, Vol. 1339 March, pp. 581-592, doi: [10.1007/978-3-030-69717-4_55](https://doi.org/10.1007/978-3-030-69717-4_55).
- Al-Adwan, A.S. and Al-Majali, A.M. (2018), "Gamification and its impact on user attitudes towards mobile payment applications: an empirical study in Jordan", *International Journal of Business and Management*, Vol. 13 No. 1, pp. 96-108.
- Alalwan, A.A., Baabdullah, A.M., Rana, N.P., Tamilmani, K. and Dwivedi, Y.K. (2018), "Examining factors influencing customer intention to use mobile payment services in Saudi Arabia", *International Journal of Information Management*, Vol. 38 No. 1, pp. 80-93.
- Alalwan, A.A., Dwivedi, Y.K. and Rana, N.P. (2017), "Factors influencing adoption of mobile banking by Jordanian bank customers: extending UTAUT2 with trust", *International Journal of Information Management*, Vol. 37 No. 3, pp. 99-110.
- Albayrak, T., Aksoy, S. and Caber, M. (2013), "The effect of environmental concern and scepticism on green purchase behaviour", *Marketing Intelligence and Planning*, Vol. 31 No. 1, pp. 27-39, doi: [10.1108/02634501311292902](https://doi.org/10.1108/02634501311292902).
- Almekhlafy, S.S.A. (2020), "Online learning of English language courses via blackboard at Saudi universities in the era of COVID-19: perception and use", *PSU Research Review*, Vol. 5 No. 1, pp. 16-32, doi: [10.1108/PRR-08-2020-0026](https://doi.org/10.1108/PRR-08-2020-0026).
- Alshurideh, M., Salloum, S.A., Al Kurdi, B. and Al-Emran, M. (2019), "Factors affecting the social networks acceptance: an empirical study using PLS-SEM approach", in *Proceedings of the 2019 8th International Conference on Software and Computer Applications*.
- Armitage, C.J. and Conner, M. (1999), "The theory of planned behaviour: assessment of predictive validity and 'perceived control'", *British Journal of Social Psychology*, Vol. 38 No. 1, pp. 35-54, doi: [10.1348/014466699164022](https://doi.org/10.1348/014466699164022).
- Arora, S. and Sahney, S. (2019), "Examining consumers' webrooming behavior: an integrated approach", *Marketing Intelligence and Planning*, Vol. 37 No. 3, pp. 339-354, doi: [10.1108/MIP-05-2018-0152](https://doi.org/10.1108/MIP-05-2018-0152).
- Arvidsson, N. (2014), "Consumer attitudes on mobile payment services—results from a proof of concept test", *International Journal of Bank Marketing*, Vol. 32 No. 2, pp. 150-170.
- Arvola, A., Vassallo, M., Dean, M., Lampila, P., Saba, A., Lähteenmäki, L. and Shepherd, R. (2008), "Predicting intentions to purchase organic food: The role of affective and moral attitudes in the Theory of Planned Behaviour", *Appetite*, Vol. 50 Nos 2-3, pp. 443-454, doi: [10.1016/j.appet.2007.09.010](https://doi.org/10.1016/j.appet.2007.09.010).
- Bauer, R. (1967), "Consumer behavior as risk taking", in Cox, D. (Ed.), *Risk Taking and Information Handling in Consumer Behavior*, Harvard University, Cambridge, MA, pp. 23-33.

- Bitrián, P., Buil, I. and Catalán, S. (2021), "Enhancing user engagement: the role of gamification in mobile apps", *Journal of Business Research*, Vol. 132 No. July 2020, pp. 170-185, doi: [10.1016/j.jbusres.2021.04.028](https://doi.org/10.1016/j.jbusres.2021.04.028).
- Chan, D. (2009), "So why ask me? Are self-report data really that bad?", *Statistical and Methodological Myths and Urban Legends: Doctrine, Verity and Fable in the Organizational and Social Sciences*, Routledge/Taylor & Francis Group, New York, NY, pp. 309-336.
- Chen, A. and Peng, N. (2012), "Green hotel knowledge and tourists' staying behavior", *Annals of Tourism Research*, Vol. 39 No. 4, pp. 2211-2216, doi: [10.1016/j.annals.2012.07.003](https://doi.org/10.1016/j.annals.2012.07.003).
- Chen, M.F. and Tung, P.J. (2014), "Developing an extended Theory of Planned Behavior model to predict consumers' intention to visit green hotels", *International Journal of Hospitality Management*, Vol. 36, pp. 221-230, doi: [10.1016/j.ijhm.2013.09.006](https://doi.org/10.1016/j.ijhm.2013.09.006).
- Chen, X., Carpenter, D., Li, X., Chen, C.C. and Hung, S. (2018), "Why do individuals continue using mobile payments - a qualitative study", *Paper Presented at the the 51th HICSS*, Hawaii.
- Chong, A.Y.L., Chan, F.T. and Ooi, K.B. (2012), "Predicting consumer decisions to adopt mobile commerce: cross country empirical examination between China and Malaysia", *Decision Support Systems*, Vol. 53 No. 1, pp. 34-43.
- Clark, D.A. and Bowles, R.P. (2018), "Model fit and item factor analysis: overfactoring, underfactoring, and a program to guide interpretation", *Multivariate Behavioral Research*, Vol. 53 No. 4, pp. 544-558, doi: [10.1080/00273171.2018.1461058](https://doi.org/10.1080/00273171.2018.1461058).
- Dahlberg, T., Guo, J. and Ondrus, J. (2015), "A critical review of mobile payment research", *Electronic Commerce Research and Applications*, Vol. 14, pp. 265-284.
- Davis, F.D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, Vol. 13 No. 3, pp. 319-340.
- De Canio, F., Fuentes-Blasco, M. and Martinelli, E. (2021), "Engaging shoppers through mobile apps: the role of gamification", *International Journal of Retail and Distribution Management*, Vol. 49 No. 7, pp. 919-940, doi: [10.1108/IJRDM-09-2020-0360](https://doi.org/10.1108/IJRDM-09-2020-0360).
- de Luna, I.R., Li_ebana-Cabanillas, F., S_anchez-Fern_andez, J. and Mu~noz-Leiva, F. (2018), "Mobile payment is not all the same: the adoption of mobile payment systems depending on the technology applied", *Technological Forecasting and Social Change*, Vol. 146, pp. 931-944.
- Dean, M., Raats, M.M. and Shepherd, R. (2012), "The role of self-identity, past behavior, and their interaction in predicting intention to purchase fresh and processed organic food", *Journal of Applied Social Psychology*, Vol. 42 No. 3, pp. 669-688, doi: [10.1111/j.1559-1816.2011.00796.x](https://doi.org/10.1111/j.1559-1816.2011.00796.x).
- Denaputri, A. and Usman, O. (2019), "Effect of perceived trust, perceived security, perceived usefulness and perceived ease of use on customers' intention to use mobile payment", *SSRN Electronic Journal*, Vol. 1, doi: [10.2139/ssrn.3511632](https://doi.org/10.2139/ssrn.3511632).
- Deterding, S., Sicart, M., Nacke, L., O'Hara, K. and Dixon, D. (2011), "Gamification: using game-design elements in non-gaming contexts", in *CHI '11 Extended Abstracts on Human Factors in Computing Systems*, Association for Computing Machinery, Vancouver, New York, Vols 7-12 May, pp. 2425-2428.
- Dorfleitner, G., Hornuf, L., Schmitt, M. and Weber, M. (2017), *The FinTech Market in Germany*, Springer, Berlin, pp. 1-121.
- Esawe, A.T. (2022), "Exploring retailers' behavioural intentions towards using m-payment: extending UTAUT with perceived risk and trust", *Paradigm: A Management Research Journal*, Vol. 26 No. 1, pp. 8-28, doi: [10.1177/09718907221091717](https://doi.org/10.1177/09718907221091717).
- Fang, X. (2019), "HCI in games", in *HCI-games 2019*, doi: [10.1007/978-3-031-05637-6](https://doi.org/10.1007/978-3-031-05637-6).
- Fishbein, M. and Ajzen, I. (1975), *Belief, Attitude, Intention, and Behavior: an Introduction to Theory and Research*, Addison-Wesley, Reading, MA.

-
- Franque, F.B., Oliveira, T. and Tam, C. (2021), "Understanding the factors of mobile payment continuance intention: empirical test in an African context", *Heliyon*, Vol. 7 No. 8, e07807, doi: [10.1016/j.heliyon.2021.e07807](https://doi.org/10.1016/j.heliyon.2021.e07807).
- Galib, M.H., Hammou, K.A. and Steiger, J. (2018), "Predicting consumer behavior : an extension of technology acceptance model", *International Journal of Marketing Studies*, Vol. 10 No. 3, pp. 73-90, doi: [10.5539/ijms.v10n3p73](https://doi.org/10.5539/ijms.v10n3p73).
- Gupta, A. and Arora, N. (2017), "Consumer adoption of m-banking: a behavioral reasoning theory perspective", *International Journal of Bank Marketing*, Vol. 35 No. 4, pp. 733-747.
- Hair, J.F., Hult, G.T.M., Ringle, C.M. and Sarstedt, M. (2017), *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, 2nd ed., Sage Publications, Thousand Oaks, CA.
- Hair, J.F., Risher, J.J., Sarstedt, M. and Ringle, C.M. (2019), "When to use and how to report the results of PLS-SEM", *European Business Review*, Vol. 31 No. 1, pp. 2-24, doi: [10.1108/ebv-11-2018-0203](https://doi.org/10.1108/ebv-11-2018-0203).
- Henseler, J. (2018), "Partial least squares path modeling: quo vadis?", *Quality and Quantity*, Vol. 52 No. 1, pp. 1-8, doi: [10.1007/s11135-018-0689-6](https://doi.org/10.1007/s11135-018-0689-6).
- Henseler, J., Ringle, C.M. and Sarstedt, M. (2014), "A new criterion for assessing discriminant validity in variance-based structural equation modeling", *Journal of the Academy of Marketing Science*, Vol. 43 No. 1, pp. 115-135, doi: [10.1007/s11747-014-0403-8](https://doi.org/10.1007/s11747-014-0403-8).
- Henseler, J., Ringle, C.M. and Sinkovics, R.R. (2009), "The use of partial least squares path modeling in international marketing", *Advances in International Marketing*, Vol. 20, pp. 277-319, doi: [10.1108/S1474-7979\(2009\)0000020014](https://doi.org/10.1108/S1474-7979(2009)0000020014).
- Hill, R.J., Fishbein, M. and Ajzen, I. (1977), "Belief, attitude, intention and behavior: an introduction to theory and research", *Contemporary Sociology*, Vol. 6 No. 2, p. 244, doi: [10.2307/2065853](https://doi.org/10.2307/2065853).
- Hong, I.B. and Cha, H.S. (2013), "The mediating role of consumer trust in an online merchant in predicting purchase intention", *International Journal of Information Management*, Vol. 33 No. 6, pp. 927-939, doi: [10.1016/j.ijinfomgt.2013.08.007](https://doi.org/10.1016/j.ijinfomgt.2013.08.007).
- Hossain, M.A. (2019), "Security perception in the adoption of mobile payment and the moderating effect of gender", *PSU Research Review*, Vol. 3 No. 3, pp. 179-190, doi: [10.1108/PRR-03-2019-0006](https://doi.org/10.1108/PRR-03-2019-0006).
- Hossain, I., Ang, Y.N., Chng, H.T. and Wong, P.S. (2019), "Patients' attitudes towards mobile health in Singapore: a cross-sectional study", *MHealth*, Vol. 5 No. 11, p. 34, doi: [10.21037/mhealth.2019.08.07](https://doi.org/10.21037/mhealth.2019.08.07).
- Hsu, C.L. and Chen, M.C. (2018), "How does gamification improve user experience? An empirical investigation on the antecedences and consequences of user experience and its mediating role", *Technological Forecasting and Social Change*, Vol. 132, pp. 118-129, doi: [10.1016/j.techfore.2018.01.023](https://doi.org/10.1016/j.techfore.2018.01.023).
- Hu, L. and Bentler, P.M. (1998), "Fit indices in covariance structure modeling: sensitivity to underparameterized model misspecification", *Psychological Methods*, Vol. 3 No. 4, pp. 424-453, doi: [10.1037/1082-989x.3.4.424](https://doi.org/10.1037/1082-989x.3.4.424).
- Hussein, Z., Oon, S.W. and Fikry, A. (2017), "Consumer attitude: does it influencing the intention to use mHealth?", *Procedia Computer Science*, Vol. 105 No. December 2016, pp. 340-344, doi: [10.1016/j.procs.2017.01.231](https://doi.org/10.1016/j.procs.2017.01.231).
- Kavitha, K. and Kannan, D. (2020), "Factors influencing consumers attitude towards mobile payment applications", *International Journal of Management*, Vol. 11 No. 4, pp. 140-150, doi: [10.34218/IJM.11.4.2020.015](https://doi.org/10.34218/IJM.11.4.2020.015).
- Khatimah, H. and Halim, F. (2016), "The effect of ATT and its decomposed, perceived behavioral control and its decomposed and awareness on intention to use e-money mobile in Indonesia", *Journal of Scientific Research and Development*, Vol. 3 No. 1, pp. 39-50.
- Kim, A.J. and Ko, E. (2012), "Do social media marketing activities enhance customer equity? An empirical study of luxury fashion brand", *Journal of Business Research*, Vol. 65 No. 10, pp. 1480-1486, doi: [10.1016/j.jbusres.2011.10.014](https://doi.org/10.1016/j.jbusres.2011.10.014).

-
- Klapper, L. and Miller, M. (2021), *The Impact of COVID-19 on Digital Financial Inclusion*, Global Partnership for Financial Inclusion (GPFI) by the World Bank, pp. 1-29.
- Koivisto, J. and Hamari, J. (2019), "The rise of motivational information systems: a review of gamification research", *International Journal of Information Management*, Vol. 45, pp. 191-210.
- Kuo, M. and Chuang, T. (2016), "Computers in Human Behavior How gamification motivates visits and engagement for online academic dissemination: an empirical study", *Computers in Human Behavior*, Vol. 55, pp. 16-27, doi: [10.1016/j.chb.2015.08.025](https://doi.org/10.1016/j.chb.2015.08.025).
- Landers, R.N., Auer, E.M., Collmus, A.B. and Armstrong, M.B. (2018), "Gamification science, its history and future: definitions and a research agenda", *Simulation and Gaming*, Vol. 49 No. 3, pp. 315-337.
- Lee, J. and Jin, C. (2019), "The role of gamification in brand app experience: the moderating effects of the 4Rs of app marketing", *Cogent Psychology*, Vol. 6 No. 1, doi: [10.1080/23311908.2019.1576388](https://doi.org/10.1080/23311908.2019.1576388).
- Legris, P., Ingham, J. and Collette, P. (2003), "Why do people use information technology? A critical review of the technology acceptance model", *Information and Management*, Vol. 40 No. 3, pp. 191-204, doi: [10.1016/S0378-7206\(01\)00143-4](https://doi.org/10.1016/S0378-7206(01)00143-4).
- Liébana-Cabanillas, F., Ramos de Luna, I.R., Montoro Ríos, F. (2017), "Intention to use new mobile payment systems : a comparative analysis of SMS and NFC payments", *Economic Research-Ekonomiska Istrazivanja*, Vol. 30 No. 01, pp. 724-742, doi: [10.1080/1331677X.2017.1305784](https://doi.org/10.1080/1331677X.2017.1305784).
- Liébana-Cabanillas, F., Sánchez-Fernández, J. and Muñoz-Leiva, F. (2014), "Antecedents of the adoption of the new mobile payment systems: the moderating effect of age", *Computers in Human Behavior*, Vol. 35, pp. 464-478, doi: [10.1016/j.chb.2014.03.022](https://doi.org/10.1016/j.chb.2014.03.022).
- Liñán, F., Rodríguez-Cohard, J.C. and Rueda-Cantuche, J.M. (2011), "Factor affecting entrepreneurial intention levels : a role for education", *International Entrepreneurship and Management*, Vol. 7 December, pp. 195-218, doi: [10.1007/s11365-010-0154-z](https://doi.org/10.1007/s11365-010-0154-z).
- Liu, D., Santhanam, R. and Webster, J. (2017), "Toward meaningful engagement: a framework for design and research of gamified information systems", *MIS Quarterly*, Vol. 41 No. 4, pp. 1011-1034, doi: [10.25300/misq/2017/41.4.01](https://doi.org/10.25300/misq/2017/41.4.01).
- Maleki, F. and Hosseini, S.M. (2020), "Charity donation intention via m-payment apps: donor-related, m-payment system-related, or charity brand-related factors, which one is overkill?", in *International Review on Public and Nonprofit Marketing*, Vol. 17 Issue 4, doi: [10.1007/s12208-020-00254-3](https://doi.org/10.1007/s12208-020-00254-3).
- Moser, A.K. (2015), "Thinking green, buying green ? Drivers of pro-environmental purchasing behavior", *Journal of Consumer Marketing*, Vol. 32 No. 3, pp. 167-175, doi: [10.1108/JCM-10-2014-1179](https://doi.org/10.1108/JCM-10-2014-1179).
- Mostafa, M.M. (2009), "Shades of green: a psychographic segmentation of the green consumer in Kuwait using self-organizing maps", *Expert Systems with Applications*, Vol. 36 No. 8, pp. 11030-11038, doi: [10.1016/j.eswa.2009.02.088](https://doi.org/10.1016/j.eswa.2009.02.088).
- Mostafa Mohamed, M. (2006), "Antecedents of Egyptian consumers' green purchase intentions: a hierarchical multivariate regression model", *Journal of International Consumer Marketing*, Vol. 19 No. 2, pp. 97-126, doi: [10.1300/J046v19n02](https://doi.org/10.1300/J046v19n02).
- Nguyen, H.V., Tran, H.X., Van Huy, L., Nguyen, X.N., Do, M.T. and Nguyen, N. (2020), "Online book shopping in Vietnam: the impact of the COVID-19 pandemic situation", *Publishing Research Quarterly*, Vol. 36 No. 3, pp. 437-445, doi: [10.1007/s12109-020-09732-2](https://doi.org/10.1007/s12109-020-09732-2).
- Osakwe, C.N., Boateng, H., Popa, S., Chovancová, M. and Soto-Acosta, P. (2016), "Understanding cosmopolitan consumers' repeat purchasing in the emarketplace: contribution from a brand orientation theoretical perspective", *E+M Ekonomie a Management*, Vol. 19 No. 4, pp. 149-166, doi: [10.15240/tul/001/2016-4-011](https://doi.org/10.15240/tul/001/2016-4-011).

-
- Paul, J., Modi, A. and Patel, J. (2016), "Predicting green product consumption using theory of planned behavior and reasoned action", *Journal of Retailing and Consumer Services*, Vol. 29, pp. 123-134, doi: [10.1016/j.jretconser.2015.11.006](https://doi.org/10.1016/j.jretconser.2015.11.006).
- Pavlou, P.A. (2003), "Consumer acceptance of electronic commerce: integrating trust and risk with the technology acceptance model", *International Journal of Electronic Commerce*, Vol. 7 No. 3, pp. 101-134, doi: [10.1080/10864415.2003.11044275](https://doi.org/10.1080/10864415.2003.11044275).
- Rahi, S. and Abd Ghani, M. (2019), "Does gamified elements influence on user's intention to adopt and intention to recommend internet banking?", *International Journal of Information and Learning Technology*, Vol. 36 No. 1, pp. 2-20, doi: [10.1108/IJILT-05-2018-0045](https://doi.org/10.1108/IJILT-05-2018-0045).
- Ringle, C.M., Wende, S. and Becker, J.-M. (2015), *SmartPLS*, SmartPLS GmbH, Boenningstedt.
- Ross, W.T. and Robertson, D.C. (2003), "A typology of situational factors: impact on salesperson decision-making about ethical issues", *Journal of Business Ethics*, Vol. 46 No. 3, pp. 213-234, doi: [10.1023/A:1025563624696](https://doi.org/10.1023/A:1025563624696).
- Rouf, M.A., Hossain, M.S., Habibullah, M. and Ahmed, T. (2022), "Online classes for higher education in Bangladesh during the COVID-19 pandemic: a perception-based study", *PSU Research Review*, Vol. ahead-of-print No. ahead-of-print, doi: [10.1108/PRR-05-2021-0026](https://doi.org/10.1108/PRR-05-2021-0026).
- Safari, K., Bisimwa, A. and Buzera Armel, M. (2022), "Attitudes and intentions toward internet banking in an under developed financial sector", *PSU Research Review*, Vol. 6 No. 1, pp. 39-58, doi: [10.1108/PRR-03-2020-0009](https://doi.org/10.1108/PRR-03-2020-0009).
- Sarstedt, M., Ringle, C.M., Cheah, J.H., Ting, H., Moisescu, O.I. and Radomir, L. (2020), "Structural model robustness checks in PLS-SEM", *Tourism Economics*, Vol. 26 No. 4, pp. 531-554, doi: [10.1177/1354816618823921](https://doi.org/10.1177/1354816618823921).
- Schierz, P.G., Schilke, O. and Wirtz, B.W. (2010), "Understanding consumer acceptance of mobile payment services: an empirical analysis", *Electronic Commerce Research and Applications*, Vol. 9, pp. 209-216.
- Shahzadal, M. and Adnan, H.M. (2022), "Attitude, self-control, and prosocial norm to predict intention to use social media responsibly: from scale to model fit towards a modified theory of planned behavior", *Sustainability (Switzerland)*, Vol. 14 No. 16, doi: [10.3390/su14169822](https://doi.org/10.3390/su14169822).
- Shankar, A. and Kumari, P. (2019), "A study of factors affecting mobile governance (mGov) adoption intention in India using an extension of the technology acceptance model (TAM)", *South Asian Journal of Management*, Vol. 26 No. 4, pp. 71-94.
- Shin, D.H. (2009), "Towards an understanding of the consumer acceptance of mobile wallet", *Computers in Human Behavior*, Vol. 25 No. 6, pp. 1343-1354, doi: [10.1016/j.chb.2009.06.001](https://doi.org/10.1016/j.chb.2009.06.001).
- Streuken, S. and Leroi-Werelds, S. (2016), "Bootstrapping and PLS-SEM: a step-by-step guide to get more out of your bootstrap results", *European Management Journal*, Vol. 34 No. 6, pp. 618-632, doi: [10.1016/j.emj.2016.06.003](https://doi.org/10.1016/j.emj.2016.06.003).
- Taylor, S. and Todd, P.A. (1995), "Understanding information technology usage: a test of competing models", *Information Systems Research. INFORMS Inst.for Operations Res.and the Management Sciences*, Vol. 6 No. 2, pp. 144-176, doi: [10.1287/isre.6.2.144](https://doi.org/10.1287/isre.6.2.144).
- Teng, P.K., Ling, T.J. and Seng, K.W.K. (2018), "Understanding customer intention to use mobile payment services in Nanjing China", *International Journal of Community Development and Management Studies*, Vol. 2, pp. 49-60.
- Ting, H., Yacob, Y., Liew, L. and Lau, W.M. (2016), "Intention to use mobile payment system: a case of developing market by ethnicity", *Procedia-Social and Behavioral Sciences*, Vol. 224, pp. 368-375.
- van Doremalen, N., Bushmaker, T., Morris, D.H., Holbrook, M.G., Gamble, A., Williamson, B.N., Tamin, A., Harcourt, J.L., Thornburg, N.J., Gerber, S.L., Lloyd-Smith, J.O., de Wit, E. and Munster, V.J. (2020), "Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1", *New England Journal of Medicine*, Vol. 382 No. 16, pp. 1564-1567, doi: [10.1056/nejmc2004973](https://doi.org/10.1056/nejmc2004973).

- Venkatesh, V. and Davis, F.D. (2000), "A theoretical extension of the technology acceptance model: four longitudinal field studies", *Management Science*, Vol. 46 No. 2, pp. 186-204.
- Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2012), "User acceptance of information technology: toward a unified view", *MIS Quarterly*, Vol. 27 No. 3, pp. 425-478, doi: [10.2307/30036540](https://doi.org/10.2307/30036540).
- Wallenius, C., Bäckman, C. and Larsson, G. (2014), "Examining the impact of personality and situational factors on decision making among military staffs", *Journal of Military Studies*, Vol. 5 No. 2, pp. 26-37, doi: [10.1515/jms-2016-0193](https://doi.org/10.1515/jms-2016-0193).
- Wulandari, N. (2017), "Cashless payment in tourism. An application of technology acceptance model", *Journal of Environmental Management and Tourism*, Vol. 8 No. 24, pp. 1550-1553.
- Yiu, C.S., Grant, K. and Edgar, D. (2007), "Factors affecting the adoption of Internet Banking in Hong Kong—implications for the banking sector", *International Journal of Information Management*, Vol. 27 No. 5, pp. 336-351.
- Zhou, T. (2011), "Understanding online community user participation: a social influence perspective", *Internet Research*, Vol. 21 No. 1, pp. 67-81.
- Zhu, B., Charoennan, W. and Embalzado, H. (2022), "The influence of perceived risks on millennials' intention to use m-payment for mobile shopping in Bangkok", *International Journal of Retail and Distribution Management*, Vol. 50 No. 4, pp. 479-497, doi: [10.1108/IJRDM-05-2020-0174](https://doi.org/10.1108/IJRDM-05-2020-0174).
- Zhuang, X., Hou, X., Feng, Z., Lin, Z. and Li, J. (2021), "Subjective norms, attitudes, and intentions of AR technology use in tourism experience: the moderating effect of millennials", *Leisure Studies*, Vol. 40 No. 3, pp. 392-406, doi: [10.1080/02614367.2020.1843692](https://doi.org/10.1080/02614367.2020.1843692).
- Zichermann, G. and Cunningham, C. (2011), "Gamification by design—implementing game mechanics in web and mobile apps", available at: http://storage.libre.life/Gamification_by_Design.pdf

Further reading

- Ajaz Khan, K. and Anam Akhtar, M. (2020), "Electronic payment system use: a mediator and a predictor of financial satisfaction. *Investment Management and Financial*", *Innovations*, Vol. 17 No. 3, pp. 246-262, doi: [10.21511/imfi.17\(3\).2020.19](https://doi.org/10.21511/imfi.17(3).2020.19).
- Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1989), "User acceptance of computer technology: a comparison of two theoretical models", *Management Science*, Vol. 35 No. 8, pp. 982-1003.

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