

Predicting the intention to use Paytech services by Islamic banking users

Paytech
services

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Abstract

Purpose – This study aims to identify the factors that could explain the intention to use Paytech services within an Islamic banking context. The authors use an extended version of the technology acceptance model to develop a causal–predictive analysis.

Design/methodology/approach – The research model and hypotheses were tested by applying partial least square-structured equation modeling to data collected from 214 users of Islamic banking in Saudi Arabia.

Findings – The results show that perceived trust has a highly significant direct effect on the intention to use Islamic Paytech services, whereas perceived risk has a significant indirect effect on IU.

Research limitations/implications – Internet banking behavior may not be static. In technology acceptance, during the various phases from introduction to the maturity phase, the respondent's perceptions tend to change

Practical implications – From the point of view of Fintech services providers, the knowledge of the factors fostering the adoption of Fintech services would allow an international expansion without the inconvenience of establishing offices or companies in countries whose legislation does not favor the operations carried out by Islamic banks.

Social implications – These digital payment services would allow access to financial services to the entire Muslim population regardless of their location (Islamic and non-Islamic nations) and will also reach out to the next generation of young Muslims as a majority are “digital natives” ready for digital Islamic financial solutions.

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Corrigendum: It has come to the attention of the Publisher that the article “Predicting the intention to use Paytech services by Islamic banking users” by Ana Irimia-Diéguez, Gema Albort-Morant, Maria Dolores Oliver-Alfonso and Shakir Ullah, published in *International Journal of Islamic and Middle Eastern*, Vol. ahead-of-print, No. ahead-of-print, <https://doi.org/10.1108/IMEFM-07-2022-0298>, contained an error in the affiliation details for Shakir Ullah. The error was introduced during the submission process and has now been corrected online. The author sincerely apologises for any confusion caused.



Originality/value – This study is the first to explore the intention to use Paytech services by Islamic banking users in Saudi Arabia. From a theoretical perspective, this work contributes to the academic literature by analyzing the intention to use Paytech services in an Islamic banking context. On the practical front, the study identifies the crucial factors that industry players can use to design their Paytech applications and services to increase financial inclusion in Saudi Arabia and other countries with similar cultures as well as to design an international expansion without the inconvenience of establishing offices or companies in countries whose legislation does not favor the operations carried out by Islamic banks.

Keywords Islamic Fintech, Islamic Paytech, Extended TAM, PLSpredict, Intention to use

Paper type Research paper

Introduction

Digital payment services are changing the traditional forms of payment worldwide because of their significant savings in costs, time and effort. Terms such as digital payments, digital money, electronic money, online payment systems or mobile payments are currently encompassed in a broader concept called “Paytech” by the financial industry. Paytech is a subsegment (namely, vertical) of Fintech services that focuses on payments and transactions (Polasik *et al.*, 2020) and, thanks to services such as Apple Pay, Samsung Pay, Kakao Pay, etc., it is the most important and fastest growing sector in Fintech services from the consumers’ perspective (Lim *et al.*, 2019).

Yet, Paytech services are not only offered by newcomers (non-traditional financial companies such as high-tech or Fintech startups) as banks play a relevant role in developing innovative payment services by expanding their traditional services to the internet (Liu *et al.*, 2019).

Various authors have recently introduced the term Paytech, such as Thakor (2020) who links innovations in payment systems and Fintech by reviewing the literature on Fintech and its interaction with banking, or Polasik *et al.* (2020) who show that the implementation of the Payment Services Directive (PSD2) generated a rapid but temporary surge in Paytech startups in Europe.

Nevertheless, there are scarce references to Islamic Paytech in the academic literature. In recent years, numerous studies have considered Fintech adoption within Islamic Finance services providers from different countries, such as Saudi Arabia, the UAE, Malaysia, Bahrain, Brunei, Indonesia, Oman and others (Hudaefi *et al.*, 2023; Hassan *et al.*, 2022a, 2022b, 2022c, 2022d; Banna *et al.*, 2021; Shaikh *et al.*, 2020). The place (a country or region) where the consumers live and different regulations or economic stages exist is an essential factor in understanding consumers’ behavior in mobile payment adoption (Liu *et al.*, 2019).

Paytech is one of the most common entry segments in Islamic finance, given the minimal Shari’a constraints, ease of user adoption and integration in existing payment gateways. The product should not involve the receipt or payment of interest and cannot be used to purchase products or services considered haram in Islam (Ullah *et al.*, 2018). Therefore, users of Islamic Paytech products will also consider its Shari’a compliance and risk, ease of use and other technology acceptance model (TAM) variables. These digital payment services would allow access to financial services to the entire Muslim population regardless of their location (Islamic and non-Islamic nations). They will also reach out to the next generation of young Muslims as most are “digital natives” ready for digital Islamic financial solutions (The Economist Intelligence Unit Limited, 2020).

In this context, the definition of Islamic Fintech emerges, combining aspects of innovation and Islamic financial services. Rahim *et al.* (2019) define Islamic Fintech as “Fintech with Shariah principles and Islamic values.” In the Islamic world, the development of companies combining Fintech and Islamic finance is evident, as well as the rapid development of the Islamic Fintech sector (Hassan *et al.*, 2022a).

According to the Global Islamic Fintech Report 2021, the Organization of Islamic Cooperation's (OIC) 57 member nations' Islamic Fintech transaction volume was US\$49bn in 2020 or just 0.7% of the global Fintech transaction volume. Furthermore, this report shows the existence of 241 Islamic Fintech companies worldwide. The top five OIC Fintech markets by transaction volume are Saudi Arabia, the UAE, Malaysia, Turkey and Kuwait, accounting for 75% of the OIC's Islamic Fintech market size.

The main enduring long-term barriers to Islamic Fintech industry expansion are a lack of a uniform set of rules and regulations controlling it and the absence of an internationally recognized regulatory body. This makes the growth of Islamic Paytech challenging.

According to [Thaker et al. \(2019a\)](#), due to “the combination of highly educated people, high levels of income and uptake of digital equipment, the usage of Islamic mobile banking services started to develop in selected Muslim countries, which is a fertile ground for mobile banking.”

In this context, we justify our research on the adoption of Paytech services by Islamic banking users in Saudi Arabia, one of the relevant member countries of the GCC. Although Islamic banking in Saudi Arabia is only a few decades old, it has emerged in an open market wherein it is excelling speedily and is competing fiercely with conventional banking. Paytech services are a reality in Islamic Fintech ([Sawwaf, 2020](#)), though their development is related to the population's intention to use (IU) and acceptance.

Some users are skeptical about the future use of Paytech due to the lack of regulation and the high level of risks perceived. Notwithstanding, customers should determine the expected value of Paytech usage, considering its benefits and risks. Customers will generally use the Fintech product or service if its benefits outweigh its risks. Thus, Fintech companies are challenged to increase the potential benefits of Fintech usage while limiting its potential risks. Hence, it is necessary to identify the factors that help to determine the IU Fintech, Paytech being one of the most used services.

This study comprehensively and concretely aims to predict and analyze the factors influencing the user's IU Paytech services by Islamic banking users in Saudi Arabia. To this end, the effect of perceived risk (PR) and perceived trust (TR) are included in addition to the classic variables of the traditional TAM – perceived ease of use (PEU), perceived usefulness (PU) and attitude (AT) – to determine the IU Paytech services.

This paper proposes a causal and predictive analysis of the IU Islamic Paytech services by applying an improved extended TAM. Academics have widely used this model to analyze the consumer's intention in several research areas and topics ([Liu et al., 2019](#)). In recent years, the number of studies related to Islamic Fintech has increased ([Hassan et al., 2022e, 2022f](#); [Rabbani et al., 2022a, 2022b](#); [Atif et al., 2021](#); [Hasan et al., 2020](#); [Shaikh et al., 2020](#)). Specifically, there is an increase in the number of studies about Islamic Fintech in the post-COVID pandemic years ([Hassan et al., 2020](#); [Hassan et al., 2022g](#)).

Nevertheless, the literature about the IU Islamic Paytech service is still rare. In this vein, we fill the gap by testing if this research model is specifically meaningful in the case of Islamic Finance services.

This study's innovative and novel contributions are as follows: most of the previous studies focus on specific Fintech services as well as online banking or mobile banking, but they rarely pay attention to Paytech services in Islamic countries ([Liu et al., 2019](#); [Schmidhuber et al., 2020](#)). The literature on Islamic Paytech is scarce ([Garrouch, 2021](#)), and the application of an improved TAM in Fintech and Paytech services is further limited ([Shaikh et al., 2020](#); [Li et al., 2019](#); [Suhartanto et al., 2020](#)). This study extends the applicability of an extended TAM to a country with a dual banking system, Saudi Arabia. The methodology used in this study, PLS-SEM, has been used in a few studies on Islamic Fintech or Islamic banking ([Liu et al., 2019](#);

Suhartanto *et al.*, 2020; Thaker *et al.*, 2019a). The knowledge about the IU Paytech services is of great importance to the development of current digital financial products and services.

After this introduction, in the next section, a conceptual framework is introduced to explain the research model and the hypotheses. Section 3 presents the methodology, while in Section 4, the results obtained. Finally, the last section concludes.

Theoretical background

Paytech

Paytech is the merger of payments and information technology (IT) concepts. According to AEFI (2020), a Paytech entity can be defined as “any company that, based on technology, develops innovative payment solutions that improve the characteristics and capabilities of existing payment methods and provide a better user experience.”

Paytech encompasses all current services and applications related to means of payment, such as mobile payment and “apps,” mobile e-wallets, electronic or internet payment, payment by QR codes, “wearables” payment, biometric payment, credit card use, smart cards, payment through voice commerce and other means of payment. Innovation in payments and related technologies have the potential to make electronic payments faster and more accessible globally (Esin, 2019). Therefore, Paytech innovation obtains better consumer experience, enhanced revenues and manageable hazards for companies and investors (Chishti *et al.*, 2020).

In this study, the Paytech sector is described as the set of technology companies that develop new applications, products or services to improve the existing means of payment and develop new methods that adjust to market trends. Fintech companies have developed disruptive payment methods that have boosted the payment sector (Polasik *et al.*, 2020; Esin, 2019; Chishti *et al.*, 2020). In an Islamic context, technological and financial innovations are accepted whenever they do not violate or contradict Sharia compliance. Paytech promises to reshape the Islamic financial landscape by improving processes’ efficiencies, cost-effectiveness, increased distribution, Shariah compliance and financial inclusion. It will allow a more significant competitive advantage for the Islamic financial sector.

Thus, both Paytech and Islamic Paytech share a similar meaning as far as the definition is concerned. Hence, this paper defines Islamic Paytech as technological companies and startups that develop and offer new payment applications, products or services that comply with religious beliefs and values (Islamic law principles).

Hypotheses development for the proposed model

Perceived trust (TR)

Previous studies (Järvinen, 2014) state that customers’ trust is a crucial factor in the adoption of electronic banking services. According to Ennew and Sekhon (2007), TR is defined as “an individual’s willingness to accept vulnerability on the grounds of positive expectations about the intentions or behavior intentions or behavior of another in a situation characterized by interdependence and risk.” Hence, promoting a technological product/service can be of great help when it comes to establishing trust in consumers. Recently, Kaabachi *et al.* (2020) stated that trust involves safe expectations about future behaviors and intentions.

Due to the inherent characteristics of the Fintech context, specifically Paytech services, trust plays a key role because of the high volume of data involved in the service offered. Meanwhile, Liébana-Cabanillas *et al.* (2019) point out that in the initial stage of implementation of a new online payment system, users may not trust without the protection provided by appropriate regulations and the use of modern technologies. Thus, users’ knowledge of the latest developments in the financial and technological sector will allow them to have greater trust in the services offered in the market and better understand the

services, products or tools by changing their PU and PEU. In this context, trust will positively influence the PU and ease of use of new financial services and products (Usman *et al.*, 2020). Specifically, the foundation of the Islamic economic system is the idea that all parties involved must be trustworthy of one another (Ayub, 2007). Based on the above literature analysis, we state the following hypotheses:

H1a. TR positively influences the user's intention to adopt Islamic Paytech services.

H1b. TR positively influences PU.

H1c. TR positively influences PEU.

Perceived risk (PR)

PR was defined by Tan and Leby Lau (2016) as an individual's degree of expected suspense related to the outcome of using a specific technology.

In a Paytech context, Featherman and Pavlou (2003) define PR as "the potential for loss in the search for the desired outcome of using an electronic service." Regarding financial and private information risks, PR negatively affects customer confidence in online financial transactions if the online providers do not meet their security or money transfer requirements (Rouibah *et al.*, 2016). Hence, an online user may incur personal losses while managing payment transactions over the internet (e.g. stealing secured personal information, theft of credit card information, false identity information and the disclosure of private consumer data or private information). Moreover, the absence of physical contact with the employees of Fintech companies creates an increased PR to consumers who perform electronic payment transactions.

Most scholars believe these risks could negatively impact the user's PU, ease of use and intention to adopt new financial technology (Liu *et al.*, 2019; Li *et al.*, 2019).

Regarding mobile payment services, previous studies suggest that there are some barriers or risks (financial and private information risks) that prevent users from using the service (Zhou, 2011). Specifically, Islamic digital banking showed that PR is a factor that significantly influences a customer's IU (Kaabachi *et al.*, 2020). Hence, based on the literature above, we test the following hypothesis:

H2a. PR negatively influences PU.

H2b. PR negatively influences PEU.

H2c. PR negatively influences users' intention to adopt Paytech services.

Perceived usefulness (PU)

Davis (1989) defined the term perceived utility as the degree to which a person believes that using a particular system would improve their job performance. Under the TAM theory, this author considered PU a key factor presumed to have a strong influence on consumers' acceptance of new technology (Davis *et al.*, 1989). Over the years, many researchers have provided evidence of a significant and direct effect of PU on the AT and IU a new system or technology, specifically in the banking sector (Suhartanto *et al.*, 2020; Usman *et al.*, 2020; Mansour *et al.*, 2016).

Likewise, in the Paytech context, if users consider that a service application is useful and can have a positive impact, they will have a positive AT toward its adoption. For instance, Li *et al.* (2019) apply an expanded version of TAM to analyze the effects of perceived utility and AT on a user's willingness to use Alipay. Their results show that PU positively affects users' ATs and intentions to use this Paytech service. Consequently, per TAM, it is hypothesized that PU would have a significant positive influence on the intention to adopt Paytech services, as we state in the following hypothesis:

H3. PU positively influences the AT toward adopting Paytech services.

Perceived ease of use (PEU)

Davis (1989) defines PEU as “the degree to which a person believes that using a particular system would be free of effort.” The TAM theory posits that PEU is a crucial factor that influences the adoption AT of an information system (Davis *et al.*, 1989). Therefore, the more positive users’ ATs, the easier the use of a new technology or application is perceived.

In the banking literature, numerous earlier studies have applied TAM to confirm the relationship between PEU and a new technology adoption AT (Usman *et al.*, 2020; Mansour *et al.*, 2016; Hossain *et al.*, 2020). Several authors have recently tested this relationship in the Fintech sector, specifically within Paytech (Hu *et al.*, 2019; Li *et al.*, 2019). Their results show that the performance of financial transactions is driven by the simplicity and ease of use of the Fintech application. This research supports previous studies in which PEU significantly impacts the AT toward using Paytech services. Thus, in light of the earlier studies, the following hypothesis is set out:

H4. PEU positively influences ATs toward adopting Paytech services.

Attitude (AT)

AT refers to personal judgments and tendencies that influence the intention to carry out a specific behavior (Zhao *et al.*, 2010). According to Mansour *et al.* (2016), AT toward the behavior is “the degree to which the performance of a behavior is positively or negatively valued.” AT directly and strongly affects consumers’ IU the new technology or system. The traditional TAM maintains a significant relationship between the consumer’s AT toward new technologies and the IU them. Earlier studies that analyzed the relationship between AT and IU new means of payment or Paytech services have confirmed the importance of AT (Li *et al.*, 2019; Liébana-Cabanillas *et al.*, 2019). Consequently, users’ ATs can affect the IU Islamic Paytech services. Therefore, the following hypothesis is established:

H5. AT positively influences the user’s intention to adopt Paytech services.

Figure 1 presented the theoretical framework based on the abovementioned variables and hypotheses.

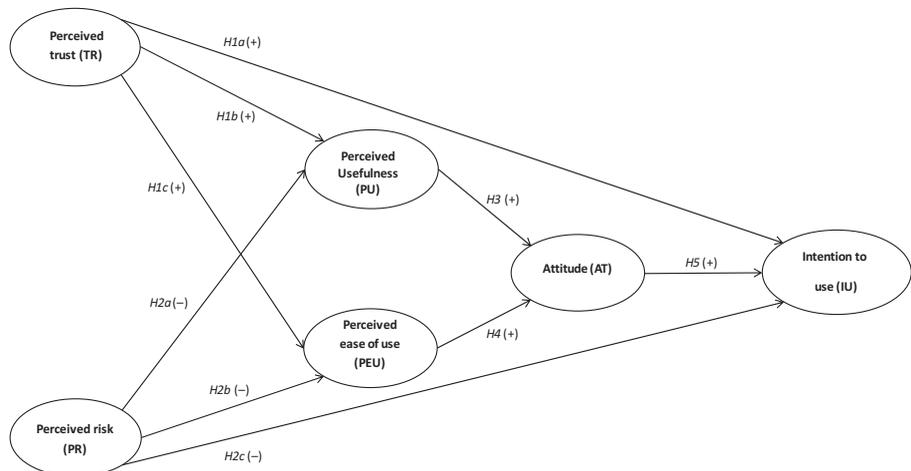


Figure 1.
Research conceptual
framework

Source: Own elaboration

Method

Data collection, sample and measures

The questionnaire was set up for the survey using constructs and items from literature related to the extended TAM. Concretely, the variables used in this quantitative-oriented study were TR, PR, PU, PEU, AT and IU.

For data collection, a questionnaire was created in English, reviewed and translated into Arabic by a native speaker for content validity. It went through the valid method of a translating survey. We then administered the survey in Arabic for the respondents' better understanding.

For translation equivalence accuracy, the draft questionnaire was tested in a rigorous process to verify its structure and design and the absence of ambiguities in the questions. According to Burns and Bush (2003), a pre-test with five to ten contributors is adequate to determine the problems related to the questionnaire's design.

Before collecting the data, a pilot study was conducted with 30 respondents. No adjustments were necessary to ensure the accuracy of the survey instrument.

The data collection was conducted in January 2021. The participants responded to the survey through an online e-survey, Google Forms survey and a link provided by a professor at King Abdulaziz University (Kingdom of Saudi Arabia). Alkhaldi (2016) indicated that the lack of proper infrastructure had hampered the Saudi adoption of mobile banking on a broader scale. As such, insufficient networks in the Saudi countryside, the low rate of mobile diffusion to the banking sector, the modest mobile usage for specific bank services and the insufficiency of necessary legal regulations that aim to raise the service quality of mobile banking constitute objective parameters that limit its proper espousal in Saudi Arabia.

Due to the novelty of Islamic Paytech services, it was necessary to address a population with a previous background to understand the concepts. The motivation to start with MBA students is due to their higher power to purchase and use payment services via smartphones.

The population was selected from 332 MBA students of this institution and other personal contacts to increase the number of respondents. The question "Do you use Islamic digital banking?" was introduced to classify the sample. The final sample was selected from 214 users of Islamic digital banking services.

The sample also met the criteria Erdfelder *et al.* (2009) proposed based on statistical power analysis in G*power 3.1.9.2 software. This program was designed to estimate statistical power and effect size. The minimum sample size required for this study is 74 (where the level of power = 0.95, the effect size = 0.15, the significance value = 0.05 and the number of predictors = 5). Therefore, the estimation for sample size suggests that the sample size is adequate for this kind of research.

The questionnaire is divided into two parts. The first part inquired about the demographic profile of the respondents, and the second part contained measurement items. The items of this questionnaire were measured on a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). All the variables used in this study were adapted from previous studies to the new Islamic context. The items used and adapted were PEU (Davis, 1989), PU (Davis, 1989), PR (Marakarkandy *et al.*, 2017), TR (Marakarkandy *et al.*, 2017), AT (Venkatesh *et al.*, 2003) and IU (Venkatesh *et al.*, 2003). Two control variables were included: age and gender.

Statistical methodology

This study applies the partial least squares – structured equation modeling (PLS-SEM) to analyze the data. The decision to choose this technique is mainly based on the characteristics of the indicators, constructs and relations in the proposed research model. This methodology

offers an objective criterion for examining structural relations, and it is appropriate to test complex relationships in the structural models concerning the associations among constructs (Sarstedt *et al.*, 2016). Moreover, recent advances in the application of PLS-SEM offer more advanced and sophisticated analyses, especially for prediction-oriented research.

Because of its maximum interest and applicability, this method has been used and recommended in previous empirical studies focused on predicting the dependent constructs and the complex interrelationships between latent variables (Hair *et al.*, 2014). This methodology has been used in recent works on Islamic Fintech, Islamic Paytech or Islamic online banking (Al nawayseh, 2020; Nurfadilah and Samidi, 2021). Besides, this statistical software is widely used in marketing, business or administration (Hair *et al.*, 2014). Smart PLS 3.2.7 software was used to conduct the research model and hypotheses.

Analysis and results

The analysis and interpretation of PLS results have two main stages: the measurement and structural models. The first stage determines whether the indicators and constructs have been measured correctly (outer model), and the second stage determines whether the relations between the constructs are significant or not.

Measurement model assessment

The measurement model section assesses the reliability and validity to prove the feasibility of the individual items and constructs used in the research model. The results, reported in Table 1, display that all the standard factor loadings are larger than 0.7, except PEU2, with a value of 0.411. This indicator was eliminated, and the PLS algorithm was recalculated. Then, all items are considered satisfactory.

As shown in Table 1, all the constructs comply with Cronbach's alpha, Dijkstra-Henseler's rho (rho_A) and composite reliability (CR) due to having figures over the critical 0.7 level, showing that all the constructs have convergence or internal consistency. Finally, it can be observed that all the constructs satisfy the criterion of 0.5 points (equal to or above) demanded by the average variance extracted (AVE), fulfilling the convergent validity of the constructs and dimensions.

In a reflective model, the indicators share a common theme and are interchangeable. Including one or more indicators from the domain does not materially alter the content validity of the construct.

Table 2 presents the test of discriminant validity, following the Fornell-Larcker criterion. As the cross-loadings for all the constructs (the AVE's square root) are higher on their respective constructs than on the other constructs, the results show that all the constructs are consistent, acceptable and confirmed by the Fornell-Larcker criterion.

Structural model assessment

The research hypotheses were tested and assessed with a bootstrapping of 5,000 resamples (Hair *et al.*, 2014). Table 3 provides the generated standard errors, *t*-statistics, *p*-value and 95% bias-corrected confidence intervals (BCCI). This table also includes the explained variance of the endogenous variables through the R^2 level. In this case, all the endogenous variables fulfill Falk and Miller's criterion, surpassing the minimum value of 0.10. Hence, all the variables reach a satisfactory level of explanatory power.

The structural model results reveal that all the hypotheses have significant relationships with their respective variables. The direct relationships are robust and acceptable because they have *t*-values greater than 0.226 (two stars), except *H2*, that measure the direct link between PR and IU (*t*-values < 1.65). Hence, this result shows that PR does not have a direct

Constructs	Code	SL	Cronbach's alpha	rho_A	CR	AVE
TR			0.889	0.893	0.931	0.818
	TR1	0.909				
	TR2	0.870				
PR	TR3	0.933	0.818	0.836	0.916	0.845
	PR1	0.905				
	PR2	0.934				
PU			0.827	0.827	0.885	0.659
	PU1	0.775				
	PU2	0.831				
	PU3	0.819				
PEU	PU4	0.822	0.780	0.721	0.787	0.574
	PEU1	0.873				
	PEU2					
	PEU3	0.889				
AT			0.836	0.841	0.890	0.670
	AT1	0.852				
	AT2	0.765				
	AT3	0.820				
IU Paytech services (IU)	AT4	0.835	0.856	0.865	0.903	0.700
	IU1	0.829				
	IU2	0.873				
	IU3	0.763				
Control variables	IU4	0.876				
	Age	1.000	1.000	1.000	1.000	1.000
	Gender	1.000	1.000	1.000	1.000	1.000

Notes: The item PEU2 is problematic and so removed from the final analysis. SL = Standard loadings; rho_A = cronbach's alpha; CR = composite reliability; AVE = average variance extracted
Source: Own elaboration

Table 1.
Measurement model results

Construct	Fornell-Larcker criterion					
	AT	IU	PR	TR	PU	PEU
AT	0.819					
IU	0.734	0.837				
PR	0.182	0.181	0.919			
TR	0.760	0.651	0.084	0.905		
PU	0.784	0.665	0.251	0.732	0.812	
PEU	0.749	0.665	0.253	0.657	0.742	0.758

Source: Own elaboration

Table 2.
Measurement model: discriminant validity

positive influence on IU. Nevertheless, we analyze if PU mediates an indirect effect of PR on IU and AT (H8) or PEU and AT (H9). As shown in Table 3, both indirect relationships are significant. H8 and H9 represent a complete mediation as the indirect effects are significant, but the direct effect is insignificant. In other words, the risk perceived by users significantly impacts the IU Paytech services due to its effect on PEU or PU and AT.

Structural path	Path coefficient $R^2_A = 0.667$	t -value $R^2_{IU} = 0.705$	p -value $R^2_{PU} = 0.565$	95% BCCI $R^2_{PEU} = 0.545$	Support
<i>Direct effect</i>					
<i>H1a (+): TR→IU</i>	0.211***	2.364	0.018	[0.059;0.407]	Yes
<i>H1b (+): TR→PU</i>	0.716***	16.288	0.000	[0.625;0.798]	Yes
<i>H1c (+): TR→PEU</i>	0.640***	13.525	0.000	[0.541;0.729]	Yes
<i>H2a (-): PR→PU</i>	0.191***	3.653	0.000	[0.092;0.296]	Yes
<i>H2b (-): PR→PEU</i>	0.199***	3.960	0.000	[0.097;0.296]	Yes
<i>H2c (-): PR→IU</i>	0.052 ^{Nsig}	1.160	0.246	[-0.040;0.136]	No
<i>H3 (+): PU→A</i>	0.508***	8.309	0.000	[0.384;0.624]	Yes
<i>H4 (+): PEU→A</i>	0.372***	5.492	0.000	[0.241;0.507]	Yes
<i>H5 (+): AT→IU</i>	0.563***	6.353	0.000	[0.369; 0.711]	Yes
<i>Indirect or mediated effect</i>					
<i>H6: TR-PU-AT-IU</i>	0.205***	4.946	0.000	[0.124;0.287]	Yes
<i>H7: TR-PEU-AT-IU</i>	0.134***	3.839	0.000	[0.072;0.208]	Yes
<i>H8: PR-PU-AT-IU</i>	0.055***	3.500	0.000	[0.025;0.086]	Yes
<i>H9: PR-PEU-AT-IU</i>	0.042***	2.670	0.008	[0.015; 0.076]	Yes
<i>Control variables</i>					
Age→IU	-0.017 ^{Nsig.}	0.343	0.731	[-0.115; 0.074]	No
Gender→IU	-0.087 ^{Nsig.}	1.831	0.067	[-0.183;0.004]	No

Notes: *** $t(0.001, 4999) = 3.09$. Sig. denotes a significant direct effect at 0.05; Nsig. denotes a non-significant direct effect at 0.05 based on $t(4999)$, one-tailed test. R^2 = coefficient of determination; Q2 = predictive relevance of endogenous variable (omission distance = 7). Threshold for R^2 value ≥ 0.25 (weak); ≥ 0.50 (moderate); ≥ 0.75 (substantial)

Source: Own elaboration

Table 3.
Structural model
results

Although the direct effects of TR on IU Paytech services were significant, the indirect effects of TR on IU mediated by PU and AT (*H6*) or by PEU and AT (*H7*) were also analyzed. As shown in Table 3, both indirect relationships are significant. Thus, there is a partial mediation as direct and indirect effects are significant. Therefore, our results offer evidence to sustain all the indirect relationships within the research model (mediated).

Finally, the control variables, age and gender, have non-significant effects on the IU Paytech services. Therefore, the structural model assessment concludes that the proposed direct hypotheses (*H1a*, *H1b*, *H1c*, *H2a*, *H2b*, *H3*, *H4*, and *H5*) are supported.

Assessment of the predictive validity

This study also performs a predictive analysis to verify the predictive ability level of the proposed research model by applying the current PLS predict algorithm of the SmartPLS software version 3.2.7. Our results (available on request) point out that the threshold for Q2 value are positive, except for the indicators AT4 and PEU1. Hence, the model proposed offers a predictive relevance performance at the constructs and indicators level.

Discussion and conclusions

The main objective of this study is to identify the factors that might enlighten a consumer's adoption preferences for Islamic Paytech services. The paper covers a literature review of variables and relationships used in extended TAM. It presents a research model that analyzes the direct and indirect effects of the constructs used in the traditional TAM (PEU, PU, AT and IU) with the incorporation of two new variables (PR and TR). These variables

will, directly and indirectly, influence the AT and the consumer's adoption of Islamic Paytech services.

In addition, a new term, Islamic Paytech, was introduced into the business literature. Thus, our study enhanced the literature on TAM theory, corroborating the usefulness of this model.

Our results confirm that all the hypotheses are significant. The results show that TR has a highly significant direct effect on the IU Paytech services. By contrast, PR has a significant indirect effect on IU. This implies that the service providers should focus on reducing the PR and increasing customers' trust to increase the penetration rate of Islamic Paytech services. These findings corroborate the need to develop Paytech services that may be easy to use, secure and attractive to the consumer. The constructs used in the traditional TAM, PEU, PU, AT and IU, are in line with previous studies (Mansour *et al.*, 2016; Hossain *et al.*, 2020), Fintech services (Irimia-Diéguez *et al.*, 2023; Shaikh *et al.*, 2020) and digital payments (Suhartanto *et al.*, 2020; Karim *et al.*, 2020). As stated in previous studies (Hu *et al.*, 2019; Usman *et al.*, 2020), PR can affect the current Islamic consumer's adoption of Paytech services. Our empirical results reveal that the negative and direct effect of PR on the IU is non-significant. This result changes when the indirect effects are studied. In line with our results, some other previous studies, such as Schmidhuber *et al.* (2020), Li *et al.* (2019) and Thaker *et al.* (2019b), reveal a positive and significant effect of TR on IU Islamic Paytech services.

The study contributes to both theory and practice. From a theoretical view, by adding a clear and straightforward definition of Islamic Paytech to research, based on previous studies on payment methods (Garrouch, 2021; Lim *et al.*, 2019) and also on the recent studies defining the term Paytech (Esin, 2019; Chishti *et al.*, 2020). In addition, an extension of a TAM is proposed identifying the crucial factors that customers in the Islamic banking context value adopting the Paytech apps and services apply based on Islamic banking principles. In particular, this study is the first of its kind in Saudi Arabia, and the findings can be generalized to other Islamic countries. On the practical front, the study gives evidence to the Islamic banking companies offering Paytech services to a Muslim customer base.

The findings of this study are particularly important for Islamic Fintech management, specifically for corporations operating in the banking, technology and Fintech sectors. Our empirical research notes that consumers consider that TR and PR are two fundamental factors for changing consumers' ATs about the IU Paytech services. Even if the consumer's risk does not directly affect the IU these services, they need to perceive that Islamic Paytech services are easy to use and valuable to make such a decision. For that reason, managers must work to develop innovative, simple, accessible and safety Paytech services without neglecting the security of these tools and services. Through verification and consumer authentication, fraud prevention in online transactions will promote consumer confidence. Risk reduction, together with the strengthening of consumers' trust, will increase users' willingness to employ the services. At this point, the determinants of the IU the services offered by Paytech companies could be taken into account by Islamic banking in developing digital payment tools and procedures, fostering both the digital transformation adapted to the needs of users and innovation in the Islamic financial sector.

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