

## Student's perception of mobile payment application using TAM model: An empirical study in Saudi Arabia

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### ABSTRACT

The growth in Information and Communication Technology has brought dynamic changes to financial payment systems through smart devices, and mobile payment systems are significant among different smart payment systems. Further, the Technology Acceptance Model's components affect the smart payment user's behavior. Moreover, students are a substantial part of society and are more inclined to use mobile payments. Therefore, the present research examines the influence of technology adoption factors on the perception of students using mobile payments. The study adopted TAM components as influencing factors, such as Perceived usefulness, perceived ease of use, Perceived cost, and Perceived trust. The data was collected from 100 respondents consisting of male and female students. The study employed simple regression analysis to report the results. The results show that the perception of students towards the use of m-payment is strong, with a mean of 1.52. The result is similar to the explanatory variables, ranging from 1.77 to 1.97. The study found that the technology adoption factors, such as Perceived usefulness, perceived ease of use, and Perceived cost, positively influenced the students' perception of using mobile payments with p-values ranging from 0.001 to 0.049. The results of Perceived trust were positive but insignificant. Therefore, the present research observed a significant influence of technology adoption factors on the perception of students using mobile payment.

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## 1. Introduction

Communication technology is rapidly evolving in both developed and developing countries, resulting in widespread internet use and the establishment of electronic commerce as a crucial tool for businesses and consumers (Rupp & Smith, 2002). Previously, credit cards or cash were used in commercial transactions, but advances in communication technology have totally altered the way payments are made. Because of these improvements, smart device users can now make electronic payments via a variety of methods, including contactless payments, web transactions, and card swiping. As a result of this evolution, digital payment methods have grown in popularity, enabling the exchange of products and services without the necessity for face-to-face communication. Digital payment systems also enable exact financial transaction tracking. Businesses are compelled. Society's widespread adoption of mobile phones has significantly contributed to both personal and professional development. Mobile payment, often known as m-payment, is one of the most essential ways to use mobile devices for financial transactions, among the numerous accessible options. Because people in developing countries frequently have to travel long distances for financial transactions, the advent of m-payment has drastically transformed traditional payment systems around the world (Fan et al., 2018; Zhou, 2013; Asamoah et

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al. 2020). Mobile banking, or M-banking, services are available online and via cellphones, with both advantages and downsides (Rabbani, 2020). In recent years, mobile network providers have launched a wide range of mobile data services, with varying consequences on end customers. According to Qi et al. (2009), these services meet a variety of societal demands, including information, dissemination, and even fashion trends (Qi et al., 2009).

With the capacity to easily access banking services via smartphones, mobile banking has emerged as a critical component of mobile technology (Alalwan et al., 2016; Karjaluoto et al., 2012). Furthermore, governments in developing countries use communication technologies for the advantage of both their citizens and themselves. Individuals can now access government services more easily because to the widespread availability of cellphones. Mobile payment solutions, in particular, make it easier to conduct e- and m-commerce transactions, reducing the need for cash at retail locations. With the capacity to easily access banking services via smartphones, mobile banking has emerged as a critical component of mobile technology (Alalwan et al., 2016; Karjaluoto et al., 2012). Furthermore, governments in developing countries use communication technologies for mutual benefit.

The goal of this study is to use the Technology Acceptance Model (TAM) to investigate how students perceive utilizing mobile payment apps. This study focuses on how people act when using a specific service. This notion focuses on the behavioral objective of using technology due to its perceived utility and ease of use. The perceived ease of use reflects the user's efforts to become acquainted with new technology. The TAM model is well-known because it is simple to implement.

## 2. Literature Review

The rapid expansion of information and communication technology has had an impact on how businesses normally operate, notably in terms of payment methods. As a result, smart device payment solutions have become increasingly popular. Nonetheless, each group has an own perspective on these systems, which changes from group to group. The current literature review aims to provide an overview of the factors that influence the adoption of mobile payment platforms. Kamal Abdella et al. (2022) employed the Technology Adoption Models (TAM) and PLS path modeling to assess the factors impacting digital payment uptake. According to the study's findings, consumers' desire to use mobile payments is aided by their positive opinions and perceptions of its utility, but it is hampered by their fears of danger. Liébana-Cabanillas et al. (2015) investigated user behavior with reference to QR code mobile payments using the QRPA model, and discovered that innovation is one approach that pushes consumers to adopt new technologies. Similarly, Franque et al. (2021) evaluated how African mobile payment users applied D&MIS, ECM, and PLS-SEM models. They concluded that, whereas information system quality had no positive effect on the use of mobile payments, information quality did. In addition, service quality was positively related to the adoption of mobile payment services.

In a more recent study, Rabbani (2020) used PLS for data analysis to evaluate banking users' inclination to accept mobile banking services inside the TAM Framework. The study found that perceived ease of use, utility, and risk are the three factors that affect customer loyalty in mobile banking. Lee et al. (2015) looked into users' opinions and satisfaction with mobile payments in the insurance industry using path analysis and multiple regression. Compatibility was found to have a significant impact on user attitudes, with perceived usefulness and simplicity of use having a positive effect on customer satisfaction. Qi et al. (2009) likewise looked into the variables impacting consumers' adoption of mobile data services using the extended TAM model. They then employed structural equation modeling to explain their findings. They discovered that while brand experience and mobile service facilitation influenced views toward mobile networks, new capabilities and mobile voice services shaped user aspirations.

Wang and Shin (2022) investigated how to improve the adoption of educational app platforms by combining PPM and TAM frameworks. They used SEM and fuzzy logic analysis to uncover favorable correlations between perceived utility, convenience of use, personal learning preferences, and e-learning uptake. Aldammagh et al. (2021) attempted to enrich the adoption of mobile banking by expanding the TAM and TPB models to include an emphasis on trust. El-Kassem et al. (2020) used the TAM and SEM to investigate why users of technologies adopt e-government services on mobile devices and discovered that perceived utility, simplicity of use, and trust had a favorable influence on user wishes. Except for simplicity of use, affordability, and trust, Altwairesh and Aloud's (2021) examination of merchant views toward mobile payment integrations using the TAM and multiple regression technique found that other aspects were least important in mobile payment system adoption. In addition to including the variables of mobility and expressiveness, Zmijewska et al. (2004) explain how to utilize TAM to study the factors that lead to the adoption of mobile payment technology. Perceived utility, cost-effectiveness, expressiveness, trust, and mobility were found to reliably predict mobile payment behavior.

In their 2008 study, Cyril Eze et al. investigated the dynamics of payment trust in the context of mobile payments and discovered that consumers' perceptions of security had a major influence on their use of these systems. Using TAM, Saif et al. (2020) investigated the links between instructors' learning outcomes and mobile app usage trends. They discovered that instructors' performance improved higher with mobile-integrated courses compared with non-mobile support courses. Singh and Singh (2023) used

and integrated the TAM and SEM approaches to analyze the adoption of mobile banking applications during the COVID-19 era and discovered that user attitude had a significant impact in the fintech application's acceptability. Behera and Kumra (2024) described contemporary mobile payment systems utilizing the theory-context-characteristics-methodology framework. They suggested that future studies look into the acceptability of mobile payments in developing countries, privacy problems, and payment method abandonment.

Moorthy et al. (2018) used multiple regression to investigate the features that drive users to use mobile payment services. They discovered that performance expectations, favorable conditions, and perceived security were significant drivers of mobile payment usage. Belanche et al. (2022) used TAM and SEM methodologies to analyze mobile payment systems during the COVID-19 pandemic, focusing on individuals' perceived risk in peer-to-peer payments. While social influence and risk perceptions played little roles in technology adoption, user attitude and control perceptions had a significant impact on behavioral intentions. Ha et al. (2023) investigated financial literacy and perceived trust in the context of mobile payment acceptance in Vietnam. Their research revealed that, while higher levels of financial literacy influenced users' intentions, trust increased mobile payment acceptance.

Using a systems approach, Hameed et al. (2024) explored how visitors viewed mobile payment systems and concluded that perceived control, social influence, threat, and value were among the factors influencing tourists' adoption of these payment methods. According to Dzandu et al.'s (2022) research, social impacts and user value influence user engagement in mobile payment systems, with a positive association established. Abrahao et al. (2016) used the UTAUT model to investigate the rise of mobile payments in Brazil and discovered that users' intentions were completely controlled by perceived risk, with perceived cost having no effect on their intentions. Turker et al. (2022) used a modified UTAUT model to study QR code payment systems, their use, and user behavior during the pandemic. They concluded that perceived utility, compatibility, and trust were important factors in determining users' intents to use QR code payments. Alomau and Ellyawati (2021) used the enlarged TAM model to propose that social awareness and communication have a centripetal effect on the frequency and habitual use of mobile payments in Indonesia. When the wet, active, and mass activity systems components were integrated, they had a positive overall impact on the intention to embrace mobile payments.

Jawad et al. (2022) used an enlarged TAM model to study the factors influencing mobile payment acceptance in several Asian countries. Perceived risk was found to have a positive impact on predicting user intentions, whereas perceived utility, trust, simplicity of use, and social influence were found to be negative. Cobanoglu et al. (2015) used the TAM model to examine mobile payments, which include a variety of security, user experience, and acceptance aspects. According to the study's findings, subjective norms have the greatest influence on the hotel industry's adoption of mobile payment solutions. Lule et al. (2012) assessed parents' willingness to utilize TAM to pay for banking services in Kenya and identified the reasons for low utilization rates. Key characteristics of effective strategies, such as perceived self-efficacy, believability, effort involved, and perceived utility, have all favorably influenced mobile banking practices. Kavitha and Kannan (2020) examined how consumers accepted various mobile payment applications depending on perceived benefit, perceived risk, and ease of use. They discovered that these features influenced the adoption of mobile payments. Li et al. (2019) used Alipay, a popular mobile payment system, to test the TAM model and see how it affects people's behavior when using mobile payments in China. Thus, customers' attitudes regarding taking mobile payments were influenced by perceived risk, utility, and ease of use, among other considerations.

Gupta et al. (2023) used the TAM and technology moderation paradigms to study the factors that influence consumers' intentions to continue using mobile payment applications. According to their findings, exogenous factors such as perceived value, cross-sectional use, enjoyment, and social influence influenced the mediating variables of satisfaction and trust, which in turn influenced users' willingness to continue using mobile payments. Mugo et al. (2017) evaluated the mobile and smart technology applications of e-learning via the lens of TAM. They discovered that these technologies influenced people's attitudes toward adopting online learning platforms, making them critical components of the educational technology ecosystem. In this framework, Ajzen and Fishbein produced the Theory of Reasoned Action (TRA) in 1980, while Ajzen suggested the Theory of Planned Behavior (TPB) in 1991. These models reflect the basic behavioral motives that drive an end user's attraction to a specific technology, as well as how that technology relates to an individual's attitudes. Davis (1989) envisioned TAM as a global framework for embracing and applying emerging technologies in society. It remains one of the best models for predicting how individuals will see their behavior as they acquire new technologies.

Venkatash and Bala (2008) increased the model's dimensions by adding elements including price, usability, and trust. Lee et al. (2015) used T.A.M. to examine the factors impacting the uptake of mobile payments, with a particular emphasis on perceived usefulness, perceived cost, and trust—all of which have been shown to affect the use of intelligent payments. Perceived usefulness (PU), according to Davis (1989:79), is a measure of a person's opinion that their activities would increase the value of the target system, overriding the widespread system emphasis on utilization. Kim et al. (2010) were able to show that PU is a requirement

for the adoption of mobile payments since there was a correlation between the usage intention of mobile payment measures and PU (Singh & Sinha, 2020; Altwaireesh & Aloud, 2021). Singh and Sinha (2020) defined cost in mobile payments systems as payments-related expenses such as payment service provider fees, capital costs, risk expenses, service, service charges, and mobile device purchases. Earlier studies (Altwaireesh and Aloud, 2021; Dwivedi et al., 2017) revealed that perceived cost is a barrier to mobile payment.

According to Davis (1989), individuals perceive systems as simple to use even when they actually require a significant amount of effort. Numerous studies have demonstrated that perceived ease of use has a positive effect on the acceptability of mobile payments, and users of various payment systems have found that mobile payments need little effort to use (Kim et al. 2010). Users emphasize perceived trust as important for technology acquisition because, according to Chandra et al. (2010), they are risk-averse throughout the technology adoption lifecycle. Trust in mobile payments is described as a user's confidence in the system's security and efficiency, and various studies have demonstrated that trust is one of the elements motivating people to accept mobile payments.

The current study looked at previous research on technology users' attitudes toward accepting mobile payment systems as a platform for financial transactions. The study discovered that prior studies, using a variety of technology adoption models, have reported on a wide range of factors influencing users' behavioral intentions. While these studies were conducted in various parts of the world, more study is required in the Saudi Arabian setting, particularly regarding students' firsthand perceptions. Therefore, the current study intends to examine students' behavioral perceptions regarding mobile payment system usage using the TAM approach.

**H0<sub>1</sub>:** *A positive association exists between perceived usefulness and students' perception of M-payments.*

**H0<sub>2</sub>:** *A negative association exists between perceived cost and students' perception of M-payments.*

**H0<sub>3</sub>:** *A positive association exists between perceived ease of use and students' perception of M-payments.*

**H0<sub>4</sub>:** *A positive association exists between perceived trust and students' perception of M-payments.*

### 3. Data and Methodology

This study focuses on analyzing students' perceptions of mobile payment (m-payment) adoption in Saudi Arabia. A structured questionnaire was designed to assess key factors related to technology adoption, including perceived usefulness, ease of use, cost, and trust. Each of these factors was measured using a Likert scale, with responses ranging from "1" (strongly agree) to "5" (strongly disagree). To gather the necessary data, a questionnaire containing 31 questions was distributed to students at the College of Business Administration in Kharj (CBAK), Prince Sattam Bin Abdulaziz University. Five questions addressed the demographic characteristics of the respondents, while the remaining 26 questions focused on various aspects of technology adoption. A total of 100 students participated in the study, consisting of 80 males and 20 females. The study utilized simple regression analysis to assess the collected data, with students' perceptions (Percp) serving as the dependent variable (DV). The independent variables (IDVs) were the factors of technology adoption, namely perceived usefulness (Pu), perceived ease of use (Peou), perceived cost (Pc), and perceived trust (Pt). The significance of all variables was tested at a 5% significance level, and the model's fitness was evaluated using the R-squared (R<sup>2</sup>) value and the F-statistic. The following are the dependent and independent variables:

**Table 1**  
Description of Variables

Dependent Variable	Independent Variables
Perception of Students (Percp)	Perceived usefulness (Pu) Davis (1989); Kim et al. (2010); Altwaireesh and Aloud, 2021
	Perceived ease of use (Peou) Davis (1989); Kim et al. (2010)
	Perceived cost (Pc) Dwivedi et al. 2017; Singh and Sinha, 2020)
	Perceived trust (Pt) (Chandra et al. 2010)

Estimated model:

$$Percp_i = \alpha_i + \beta_1 Pu_i + \beta_2 Peou_i + \beta_3 Pc_i + \beta_4 Pt_i \quad (1)$$

where

*Percep* = Perception of Students on M-payments

*Pu* = Perceived usefulness

*Peou* = Perceived ease of use

*Pc* = Perceived cost

*Pt* = Perceived trust

#### 4. Results

The present study examines students' perceptions of m-payments using the TAM framework. The results are presented in the form of descriptive statistics, correlation analysis, and simple regression.

**Table 2**  
Descriptive Statistics

	N	Min	Max	Mean	SD	Skewness	
<i>Percp</i>	100	1.00	3.00	1.5200	.57700	.565	.241
<i>Pu</i>	100	1.00	3.00	1.7700	.67950	.321	.241
<i>Peou</i>	100	1.00	5.00	1.7600	.74019	1.180	.241
<i>Pc</i>	100	1.00	3.00	1.8000	.75210	.349	.241
<i>Pt</i>	100	1.00	3.00	1.9700	.77140	.052	.241

Table 2 presents the descriptive statistics, revealing that the mean value of the dependent variable, *Percp*, is 1.52, which falls between “Strongly Agree (1)” and “Agree (2)” on the Likert scale. For the independent variables—perceived usefulness (*Pu*), perceived ease of use (*Peou*), perceived cost (*Pc*), and perceived trust (*Pt*)—the mean values range from 1.77 to 1.97, indicating that students' responses similarly lie between “Strongly Agree” and “Agree”. The standard deviation for the dependent variable is 0.57, while the standard deviations for the independent variables range from 0.68 to 0.77, showing moderate variability in the responses. Additionally, the study reports the skewness statistic, which provides insight into the distribution of the data.

**Table 3**  
Correlations

	<i>Percp</i>	<i>Pu</i>	<i>Peou</i>	<i>Pc</i>	<i>Pt</i>
<i>Percp</i>	1	.643**	.650**	.545**	.580**
<i>Pu</i>	.643**	1	.632**	.463**	.642**
<i>Peou</i>	.650**	.632**	1	.512**	.571**
<i>Pc</i>	.545**	.463**	.512**	1	.686**
<i>Pt</i>	.580**	.642**	.571**	.686**	1

\*\* Significant at the 0.01 level.

Table 3 presents the correlation results between the target variable (*Percp*) and the explanatory variables (*Pu*, *Peou*, *Pc*, and *Pt*). The findings indicate a strong positive correlation between the target variable and the independent variables, with correlation coefficients exceeding +0.50. This positive and significant relationship suggests that students have a favorable inclination toward adopting mobile payment systems, even when faced with potential challenges or risks. The high degree of correlation highlights that the factors of perceived usefulness, ease of use, cost, and trust all play a crucial role in shaping students' perceptions of mobile payment usage.

**Table 4**  
Reliability Analysis

Variable	Number of items	Cronbach Alpha
<i>Percp</i>	5	0.70
<i>Pu</i>	4	0.59
<i>Peou</i>	3	0.62
<i>Pc</i>	3	0.81
<i>Pt</i>	4	0.78

Table 4 reports the results of the reliability analysis of measurement items. The internal consistency of the dependent variable (*Percp*) is acceptable. The consistency of the independent variables is acceptable except for *Peou* and *Pu*, which are less than 0.70. According to Hulin (2001), a Cronbach alpha between 0.60 and 0.70 is acceptable.

#### Table 5

## Regression Coefficients

Model	B	Std. Error	Beta	t	Sig.	Collinearity Statistics	
						Tolerance	VIF
(Constant)	.253	.126		2.013	.047		
<i>Pu</i>	.263	.084	.310	3.128	.002	.482	2.075
<i>Peou</i>	.247	.074	.316	3.347	.001	.531	1.883
<i>Pc</i>	.148	.074	.193	1.990	.049	.507	1.973
<i>Pt</i>	.051	.083	.068	.618	.538	.389	2.568
<b>R<sup>2</sup></b>	<b>0.38</b>						
<b>F-statistic</b>	<b>14.23</b>				<b>0.000</b>		

a. Dependent Variable: *Percp*

Table 5 provides the outcomes of the regression analysis. The findings reveal that perceived usefulness (*Pu*) has a positive and significant relationship with students' perceptions at the 1% significance level. This supports the null hypothesis, which suggests a positive association between students' perception and perceived usefulness. Likewise, perceived ease of use (*Peou*) mirrors the results of *Pu*, showing a significant positive association at the 1% level, aligning with the null hypothesis that states a positive relationship between students' perception and perceived ease of use. Furthermore, perceived cost (*Pc*) also demonstrates a positive and significant association, but at a 5% significance level. In contrast, perceived trust (*Pt*), while positive, is not statistically significant. This result aligns with the null hypothesis regarding the positive relationship between students' perception and perceived cost but deviates from the null hypothesis for perceived trust. The overall regression model shows a good fit, with an  $R^2$  of 38%, indicating that the independent variables collectively explain 38% of the variance in students' perceptions. Additionally, the F-statistic is significant at the 1% level, confirming the model's robustness. Collinearity diagnostics, as shown in Table 6, indicate no collinearity issues between the dependent and independent variables, with all variance proportions below 0.90. This is further supported by the variance inflation factor (VIF), confirming the absence of multicollinearity.

**Table 6**  
Collinearity Results

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	<i>Pu</i>	<i>Peou</i>	<i>Pc</i>	<i>Pt</i>
1	1	4.745	1.000	.00	.00	.00	.00	.00
	2	.085	7.483	.16	.09	.10	.47	.06
	3	.081	7.670	.78	.05	.27	.01	.01
	4	.055	9.284	.04	.38	.56	.08	.17
	5	.034	11.806	.02	.47	.06	.44	.76

a. Dependent Variable: *Percp*

## 5. Discussion

This study attempted to evaluate how students' perceptions of mobile payment systems were shaped by the Technology Acceptance Model (TAM) and its elements. According to the descriptive study, the majority of students believed that mobile payment applications were advantageous, simple to use, and economical. They also agreed on the main reasons driving these perceptions. Further correlation analysis revealed a high association between students' perceptions of the factors influencing mobile payments and those factors themselves.

According to the regression analysis, students' attitudes about mobile payments are positively influenced by perceived usefulness (PU), indicating that they consider mobile payment systems to be important and beneficial for their regular financial activities. Students' opinions were positively impacted by perceived ease of use (PEOU), which suggests that they regard mobile payment apps to be straightforward and easy to use. These findings are consistent with previous studies (Lee et al., 2015; Singh & Sinha, 2020; Altwaireesh & Aloud, 2021; Kamal Abdella et al., 2022; Wang & Shin, 2022).

Students' perceptions of perceived cost (PC) were positively influenced, in contrast to the findings for physical resources. This shows that students believe mobile payment solutions are fairly cost-effective. This finding contradicts earlier studies (Altwaireesh & Aloud, 2021; Dwivedi et al., 2017). Despite a positive association, perceived trust (PT) was shown to be statistically insignificant, implying that students are concerned about the security of mobile payment systems. Previous research (Rabbani, 2020; Aldammagh et al., 2021; Altwaireesh & Aloud, 2021; Ha et al., 2023) disagrees with this finding.

Finally, the findings support hypotheses H01, H03, and H04, demonstrating that perceived utility, ease of use, and cost all have a positive influence on students' attitudes toward mobile payments. However, H02 is not supported, as the study found that despite a positive relationship, perceived trust does not significantly impact students' perceptions.

## 6. Conclusion

Technology advancements have highlighted the importance of e-commerce for both businesses and individuals, making it an essential component of modern economic activity. Furthermore, the ability to conduct transactions using digital means has expanded in importance. The use of mobile devices for payment, or “m-payment”, has risen in popularity as a way to simplify financial transactions. Though significant research has been conducted on this topic in a broader sense, nothing has been done to investigate how Saudi students perceive mobile payments. Therefore, the goal of this study is to evaluate how students regard mobile payment systems in terms of behavior using the Technology Acceptance Model (TAM), which focuses on perceived usefulness, cost, convenience of use, and trust in.

100 students' worth of data were gathered, 80 of whom were male and 20 of whom were female. The data were then analyzed using simple regression analysis. The results show that students think mobile payments are advantageous, simple to use, and economical. The results of the regression analysis showed that students' opinions on mobile payments were positively correlated with perceived utility, ease of use, cost, and trust. Though there was a positive correlation, perceived trust was not statistically significant. The perceived usefulness and ease of use results are consistent with earlier study, however the perceived cost and trust outcomes are not consistent with earlier research.

The majority of the study's findings are particularly relevant to academics and enterprises in the information and communication technology sector. To have a more complete understanding of mobile payment adoption, more research should consider user attitude, perceived value, user engagement, service quality, and mobility.

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