

E-payment Acceptance Factors in Bahrain: Neutrosophic Perspective

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Abstract: In this study we investigate how an extended Technology Acceptance Model (TAM) might be used to gain a better understanding of the factors that influence customers' decisions to accept E-payment services in the Kingdom of Bahrain. The work adapted a quantitative approach, and a questionnaire was distributed to 530 E-payment users in the Kingdom of Bahrain using convenience sampling, and 397 viable responses were collected for further analysis. Research hypotheses were tested after a descriptive analysis was conducted to identify patterns in the data and a subsequent inferential analysis using structural equation modeling (SEM) with confirmatory factor analysis (CFA) and full-fledged structural equation modeling. The findings support the claims made in the extended TAM theory literature that the Kingdom of Bahrain banking customers are more likely to adopt E-payment methods if both ease of use and usefulness factors are present. E-payment systems Behavioral Intention to Use was also highly influenced by aspects including security, trust, and accessibility. This study seeks to improve the knowledge of TAM theory in relation to E-payment acceptance in the Kingdom of Bahrain. It identifies the factors that encourage customers in the banking sector to accept E-payment. This study also deepens our familiarity with the TAM from the customer's point of view, and the verified model can be used to help managers in the banking sector understand customer perspectives in relation to E-payment. This study makes a societal contribution by demonstrating the necessity of designing E-payment apps with a focus on elements such as ease of use, usefulness, trust, security, and accessibility, all of which are significant in the creation and design of E-payment apps. This study is unique in that it experimentally validates the extended TAM conceptual model using novel approaches such as structural equation modeling with value creation for banking sector management.

Keywords: E-payment, Extended TAM, SEM, Kingdom of Bahrain.

1 Introduction

It is widely acknowledged that the banking sector must overcome the pervasive threat posed by the ongoing digitalization of financial institutions. Banks must adapt to disruptive innovation because of the digitization of financial procedures, which will affect nearly all existing methods of engagement [1], [14]. Banks are certain that payments will be central to their future operations and that payments transformation is crucial to their digital initiatives, but they are less certain that their digital and payments transformation strategies are clear [16]. Because of its widespread use and permeation into every facet of modern life, as well as the efficiency gains and increased ability to address previously intractable issues it brings, modern technology has quickly progressed, and we have grown to rely heavily on it [19]. The expansion of financial technology, often known as FinTech, is largely attributable to the positive effects that technology has had on the financial services industry [39]. Banking, insurance, and investing have all benefited from FinTech's novel approaches to vexing problems since the industry's inception. One way in which fintech proves its value to modern society is by bolstering a nation's financial services and so helping to boost that nation's economy. Bank customers have benefited greatly from the conveniences and opportunities made possible by fintech, especially in the realms of payment and money transfer. The digital payments (E-payments) platforms offered by the latest FinTechs provide secure, convenient, and mobile movement of money between individuals and businesses [38]. Global adoption of E-payment has been aided by the accessibility of mobile devices and computers which enable users to make payments and financial transfers at any time that is convenient for them. According to market surveys cited by Sidek [49], customer acceptance of E-payments is growing, with some customers even indicating that they will not complete a purchase if an E-payment option is not provided. The Kingdom of Bahrain has made great strides in the past two decades to enhance the payment services infrastructure and to adopt E-payment to advance its banking services and financial industry. Customers in the Kingdom are increasingly willing to use electronic payment methods. However, it appears that there are some roadblocks to the smooth deployment of digital approaches that are related with the E-payment transition in the banking industry. The current literature does not provide a satisfactory response to this problem. This quantitatively exploratory study aims to identify and evaluate the most significant impediments to E-payment transformation in the private and commercial

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banking sectors in the Kingdom of Bahrain from the standpoint of adaptation and acceptance on the part of customers. The Extended Technology Acceptance Model (ETAM) will be used to investigate whether elements in the Kingdom affect customer acceptance of these technologies. In total, 397 participants were surveyed for this study; descriptive analysis was done to assure data integrity, and structural equation modeling (SEM) utilized to validate the model's predictions [3], [5]. Customers in the Kingdom of Bahrain see concerns over data security, trust, accessibility, perceived usefulness, and perceived ease of use as significant barriers to the widespread adoption of E-payment.

There were three major contributions presented in this study. As a first theoretical contribution, the study uncovered variables that motivate banking customers to accept E-payments, helping managers in the banking sector to better grasp customers' viewpoints in connection with E-payment. Second, the research contributes to enhancing future E-payment app developments by increasing familiarity with extended TAM from the customer's perspective. Finally, the study contributes to society by elucidating the key considerations that should be made while developing E-payment apps.

2 Theoretical Background

When money is transferred electronically, it is said to be an E-payment. The sender and the recipient of an E-payment both engage in the transaction electronically. It's also known as "online payment" or "e-payment." The transactions involving E-payments never involve actual cash. All monetary dealings with digital currency are executed in an online environment. This method of payment is quick and easy to use [17]. E-payment methods are now widely used around the world. Technology advancements in the areas of digital security for online transactions and the broad availability of consumer-grade Smartphones have contributed to the industry's meteoric rise and rapid expansion [38], [41]. The banking and financial services sector in Bahrain has advanced greatly over the past two decades thanks in large part to the modernization of the payment services infrastructure. Bahrain has seen a considerable uptick in the use of E-payment methods. However, there is a paucity of knowledge on the elements that affect client approval, which is why this research was conducted.

E-commerce in the modern day relies heavily on E-payment methods. With the advent of this change, businesses were compelled to abandon their reliance on paper-based transactions in favor of electronic ones, facilitated by E-payment systems [28]. E-payment systems were quickly adopted and pursued by consumers, corporations, and governments alike [53]. Consequently, E-payment systems are constantly developing and improving to meet the needs of consumers, businesses, and governments for swift, reliable, and risk-free money transfers [40], [46]. While there has been an upward trend in adopting and accepting E-payment systems in recent years, that trend slowed in 2012. The growth rate dropped from 8.6% in 2011 to 7.7% in 2012 [28]. In 2014, the value of cashless transactions rose 8.9 percent to \$387.3 billion thanks to the proliferation of E-payment means; the following year, the estimate of transactions rose 10.1 percent to \$426.3 billion [53]. Iloanya *et al.*, [23] claims that Businesses' reliance on and adoption of E-payment methods has led to significant gains in productivity and creativity in the e-commerce sector. More so, financial institutions may provide their consumers with a wide selection of electronic payment services and methods thanks to E-payment apps and systems. The widespread availability of digital transactions and E-payments in terms of services in today's corporate and public sectors, including payment cards and mobile payments, has greatly facilitated the widespread transition to E-payment methods [28]. It is the contention of Yang [56] that the widespread adoption of E-payment has resulted from the ease with which it can be used and the variety of channels through which it can be accessed. Access to these services requires clients to have a bank account and is managed by a third party and middleman within a mutually beneficial ecosystem. But as a cashless based system, risks associated with E-payments are distinct from those associated with cash transactions and include, among others, the potential for a security breach between customers and businesses in which they do not have full faith in E-payment systems, monetary loss due to errors in the transaction process, and worries about the security of the underlying technology.

2.1 E-payment Modes

E-payment services of many kinds have been developed and adopted for global payment management. These include electronic money transfer, electronic payment cards, payments made by check, payments made via mobile devices, online banking, automated teller machines, and payment gateways [26], [13]. Table 1 provides a brief description of the major modes of E-payments.

Table 1: Major Modes of E-payments

E-payment	Description	Source
Electronic Payment Cards	A debit card, stored value card, or credit card that enables a participant in such a customizable repayment agreement to access funds and pay a service provider at the point of sale using those funds.	[34]
Credit Card	Credit cards not only make it possible to make purchases over the phone and increasingly over the internet, but they also provide the added benefit	[9]

	of eliminating the need for cash transactions. Consumers who use credit cards also have the option of delaying payment until a later date, which gives them the ability to level out their spending even if they are experiencing momentary liquidity problems.	
Debit Cards	A little more than half a century ago, financial institutions began issuing credit cards. These early credit cards served only a limited purpose as payment instruments and could only be used successfully if the consumer and the retailer did business with the same financial institution. To solve this problem, the big banks have developed franchises, which allow the credit cards issued by one bank to be used at the stores owned by other banks.	[44]
Pre-Paid Cards	A card that can be used to pay for things is known as a prepaid card. You pay for a card that already has money stored on it. After that, you will be able to use the card to make purchases of up to that amount.	[18]
Electronic Funds Transfer	One of the more contemporary methods of transferring money is known as electronic fund transfer, or EFT for short. The evolution of technology in the field of telecommunications made the electronic funds transfer possible while a new age began in the field of financial transactions.	[15]
E-Banking	E-banking, or electronic banking, is an online platform that facilitates E-payment services. It has opened new avenues of expansion and development for the banking industry. Customers have access to a variety of banking services over the internet and other electronic channels thanks to the advent of electronic banking	[10], [20]
Cheques Truncation	The processing of physical cheques on an image basis, which is managed by a clearing system, is what is known as "cheque truncation," and it is a form of E-payment that has replaced the physical movement act of writing and using cheques.	[35]
Payment Gateway	Online buying has quickly become one of the most prevalent methods of shopping for both consumers and business owners today. A payment gateway is an intermediary link that manages payments and is used mostly by the banking sector	[25]

2.2 Factors Influencing E-payment Acceptance and Adoption

The use of E-payment software or systems is widespread, and its adoption is also increasing rapidly [33]. As a result, there is an urgent need to determine the elements that contribute to the use of E-payment transactions and its adoption. The paragraph that follows will focus on some of the most important elements that scholars have considered while writing about the literature that influence the acceptability and adoption of E-payment methods.

2.2.1 E-payment Perceived Usefulness

The amount to which an E-payment system may improve a customer's overall service experience while simultaneously allowing them to complete the duty at hand is directly proportional to the technology's perceived usefulness [42]. Because of this, the level of client adoption of E-payments is directly proportional to the degree to which they can improve existing financial services. Tounekti, Ruiz-Martínez, and Skarmeta-Gómez [50] claimed that the level of acceptance of a digital system can be predicted based on how beneficial the client believes the E-payment method will be to them. According to Khalaf Ahmad and Ali Al-Zu'bi [32], one of the primary factors that determines whether a new system will be accepted, and use is how valuable it is seen to be. The Technology Acceptance Model (TAM) has is utilized by many researchers to explore the usefulness influencing factor [2], [31]. These studies demonstrate how usage of different technologies is determined by the intention and behavior of the user as well as their perception of the system [8]. It has also been hypothesized that the users' perspective on whether to use any of the new software is directly influenced by the effect the system has on performance. According to this theory, users are more likely to accept the new system if they believe it would make their overall experience simpler [14]. According to the findings of a study that investigated how individuals in China intend to utilize FinTech services, users choose to use E-payment services because they believe it will be beneficial for them [22]. According to the findings of the study, attainment of financial education and life expectancy both have a substantial influence on the likelihood of adopting E-payment methods. The findings of the study also indicate that the utility of the E-payment system is impacted by the capacity of Fintech companies to fulfill the requirements of customer service, reduce wait times, and make the system more effective [22]. User satisfaction or usefulness increasingly depends on how much they value a product or service. Using the TAM model to investigate the elements that affect E-wallet, a Malaysian study concluded that usefulness could describe the outcome of intention to use and acceptance of the

E-payment system, as well as the amount of advance usage the consumer obtains. The study also found that usefulness can also predict the level of advance usage the customer receives [30]. The study also discovered that other criteria had a positive link with usefulness, and that usefulness had a substantial effect on adopting and accepting an E-payment service. This was one of the key takeaways from the research. According to the findings of another study conducted in Zambia, the usefulness factor in relation to the utilization of E-payment application systems is determined by the customers' perceptions of the results of their experiences; when the results are favorable, the user will develop a favorable attitude toward the utilization of the E-payment systems [37]. According to the findings, usefulness in the context of E-payment should also consider whether customers regard it to be convenient, efficient, and easy to repair. According to the findings of the study, customers do believe that utilizing the E-Banking service would make it possible for them to complete their tasks more quickly, easily, and effectively, and that this usefulness influences the attitude of the customer, which ultimately leads to the customer's acceptance of the E-payment service [37]. According to the findings of these studies, the usability of E-payment methods has a significant impact on whether customers adopt them. As a result, the following proposition is open to consideration:

Perceived usefulness has a significant positive impact on E-payment acceptance by customers in the Kingdom of Bahrain.

2.2.2 E-payment Perceived Ease of Use

By drawing on the experiences of customers, newly developed technology can be modified to offer the greatest possible convenience to those customers. Customers will shy away from your business if your application is difficult to use. Oladejo and Oluwaseuom [42] claim that Customers' willingness to use and comfort with an E-payment system might be a deciding factor, especially if the system is user-friendly. The convenience of E-payment methods includes both the accessibility and the simplicity of the registration processes. According to Tounekti, Ruiz-Martnez, and Skarmeta-Gómez [50], the process and processes required to carry out an E-payment ought to be condensed and straightforward. The Technology Acceptance Model (TAM) has been utilized in a great number of research to investigate the ease-of-use influencing factor [8]. The term "technology adoption model" (TAM) refers to the degree to which the potential user anticipates minimal effort in learning and implementing the newly accepted technology [14]. Ease of use in E-payment software or systems points to a technology that can be utilized without problems and indicates the system's capacity to generate the desired outcomes with least effort; it also demonstrates self-efficiency, which is something that the customer looks for [13]. According to studies, customers are more likely to adopt an E-payment system that was created with their needs in mind [50]. Additionally, the system needs to be efficient and instrumental in terms of ease of use and enhanced efficiency. According to the findings of a study conducted in Malaysia, combining various forms of E-payment with one another could further improve user friendliness [33]. Customers appear to have a favorable opinion of the integrated E-payment systems that are currently in use, particularly mobile payments. This has created the opportunity for customers to use the E-payment services on their mobile phones, which further enhances the convenience factor. Mobile payments have been particularly well received by customers. According to the findings of the study, mobile phones' M-Payment may be able to integrate numerous E-payment services simultaneously, all of which contribute to the convenience factor. According to the findings of the study, users would prefer to have all E-payment services consolidated onto a single platform rather than having them offered individually. It has been hypothesized that such an integration would boost the efficiency of the E-payment system, resulting in a discernible improvement in the ease-of-use factor and a better level of acceptability by customers [33]. Another study was conducted by Mwiya *et al.*, [37] in Zambia to investigate the elements that influence the adoption of electronic banking (e-banking is a sort of E-payment system). The findings of this study reveal that ease of use is not a factor that directly decides whether the customer will use the E-payment system; rather, it is a means that builds an attitude within the user towards using the E-payment system. The finding also demonstrates that if the E-payment system has a high level of ease, it will have a positive effect on the customer and create a positive attitude towards using the E-payment system. This can be inferred from the fact that the finding shows that the E-payment system has a high level of ease. According to the findings of the survey, consumers believe that it is simple to learn how to use an E-payment system, and they also believe that using an E-payment service does not involve a significant amount of mental effort. According to the findings of recent studies, consumers are more likely to utilize E-payment systems if those systems are straightforward and simple to operate. This demonstrates that the following statements are true:

Perceived ease of use has a significant positive impact on E-payment by customers in the kingdom of Bahrain.

2.2.3 E-payment Security

Customers' adoption of E-payment systems is heavily influenced by the level of data protection that these systems offer; yet this level of security says Ujala [52] is susceptible to considerable compromise in the event of fraudulent activity. Tounekti, Ruiz-Martnez, and Skarmeta-Gómez [50] claimed that security is defined as mechanisms and procedures whose primary goal is to reduce the vulnerability of E-Payments to external threats while also ensuring that data is kept private, and the information source is reliable. This is accomplished by reducing the vulnerability of E-Payments to external threats while also ensuring that data is kept private, and the information source is reliable. Customers perceive security

as the safe management of fund transfers and payments performed by E-payment services. In addition, because it is essential to online banking, protocols have been established for the protection of the internet and the encryption of data [32]. The sale preparation, the purchase, and the payment capture are the three stages that make up the customer's perspective of the application of data security. To measure the success of an E-payment system, one of the most important metrics to consider is consumer acceptability [51]. Customers' views of security reveal their concerns and the level of protection they require. Studies have shown that a customer's perception of the safety of an online store's checkout process has a direct impact on their propensity to use that store's E-payment service for future purchases. [52]. A survey of Zambians indicated that consumers' impressions of their bank's security were crucial in determining which institution they would use for electronic payments [37]. Another 2017 study conducted in Malaysia found that customers' confidence in the safety of the E-payment system was influenced by the security measures taken by businesses. The study also found that the integrity, confidentiality, and availability of the security system all play a role in determining whether customers will use an E-payment method [53]. That customers are more likely to embrace E-payment systems when they feel safer using them is strong evidence in favor of the following:

E-payment data security has a significant positive impact on E-payment by customers in the kingdom of Bahrain.

2.2.4 E-payment Trust

Customers' trust in E-payment systems is crucial, as is an understanding that skepticism about any novel technology is to be expected. Customers' confidence in and propensity to embrace an E-payment system are influenced by the system's features and security [26]. When it comes to conducting business, keeping private data secure, and demonstrating that all aspects of E-payment are designed to safeguard the customer's interests, trust is the determining factor. Tounekti, Ruiz-Martinez, and Skarmeta-Gómez [50] list data privacy, the ability to avoid errors, and payment confirmations as trust features. To this end, it is important for a bank's E-payment system to be trustworthy in the eyes of its customers by meeting the following criteria: providing security, keeping expected functionality, preserving customer information, and having the ability to provide robust services without losing any transactions even in extreme situations like blackouts [39], [47]. Zmijewska, Lawrence, and Steele [58] say if the E-payment system doesn't work as advertised, if the E-payment system encourages fraud, and if personal data aren't secure, customers may lose trust in the business. Consumers' level of trust in a business is directly correlated to how much they spend there, according to the available literature. Trust is proven to be negatively impacted by the presence of a risk factor, and privacy and security play a significant role in mitigating risk and fostering trust, both of which influence customers' willingness to use an E-payment system [48]. According to the findings of another study conducted in Iran, customers' decisions to utilize an E-payment transaction processing system are influenced by their level of trust in that system [8]. According to the study's findings, establishing a customer's trust is more crucial to the success of an E-payment system than merely providing a safe environment for their financial information. Integrity and transparency were highlighted as two components of trust, and it was stated that trust may be acquired through security statements, technical protections, and transaction protocols in a similar study done in Northern Cyprus by Jarollahi [26]. According to the results, people are more likely to use E-payment systems if they trust the company providing them. Thus, studies have shown that consumers' trust in E-payment systems is a significant predictor of that systems' adoption. Consequently, the following hypothesis can be put forward:

E-payment trust has a significant positive impact on E-payment customer's acceptance in the Kingdom of Bahrain.

2.3.5 E-payment Accessibility

Kameswaran and Muralidhar [29] argue that E-payment accessibility refers to the ease with which customers can use E-payment systems across a variety of channels and at any time. It has been hypothesized that streamlining the process of making and receiving E-payments may encourage their wider adoption. Chipato [13] claims that in recent decades, E-payment methods such as ATMs and point-of-sale systems have become increasingly commonplace. The usability of an E-payment system depends on how it is built; if it is particularly difficult to use, then fewer people will have the opportunity to use it. The demand and necessity of financial services by customers also have a role in determining how easily they can be accessed [29]. Customer satisfaction with an E-payment system increases with the ease with which they can utilize it [43]. According to research conducted in Jordan by Khalaf Ahmad and Ali Al-Zu'bi [32], the level of accessibility of websites offering financial services and information is contingent on numerous aspects, including the content format, the internet connection, and the user's abilities. The research also reveals that seven factors—including accessibility, usability, reliability, security, credibility, personalization, and responsiveness—determine the quality of the E-payment system. The research also reveals that seven factors—including accessibility, usability, reliability, security, credibility, personalization, and responsiveness—determine the quality of the E-payment system. It was claimed that customer satisfaction with the E-payment system in Jordan rose dramatically after the country's banks made it easier for customers to use. Access to customer accounts via automated teller machines, mobile banking, and electronic payment cards was the focus of another study done in Kenya. The study concluded that the convenience and availability of E-Banking has a substantial impact on consumers' intentions toward the adoption of the E-Payment system, and that various

forms of mobile payment had the highest accessibility level [36]. Furthermore, a study in Jordan investigated customers' satisfaction with mobile banking (M-Banking) (M-Banking). The study concludes that the widespread availability of E-Payment services like ATMs has led to a decline in the number of bank branches. Accessibility was also shown to influence customers' satisfaction with M-Payment, and it was highlighted that consumers' experiences of M-banking are improving because of the ease with which customers may use these services online and from any location [7]. Since the literature indicates that convenience plays a significant role in whether customers adopt E-payment systems, the following statement can be made:

E-payment accessibility has a significant positive impact on E-payment customer's acceptance in the Kingdom of Bahrain.

2.4 Review Findings

Although many types of E-payment have been around for some time, their acceptance and incorporation into e-commerce has only just begun to gain traction. This article analyzed studies that analyzed how frequently people utilize various types of online payment services. The data gathered demonstrated the increasing prevalence of business conducted online. As technology has improved, E-payment solutions have become more appealing to customers because of their convenience. According to the research, consumers now have the option to perform financial transactions electronically thanks to the proliferation of various E-payment systems. The literature suggests that there are five factors that have contributed to the widespread adoption of E-payment systems: perceived usefulness, perceived ease of uses, security, trust, and accessibility. These factors provided the basis for developing the research conceptual model which is described below.

2.5 Proposed Research Conceptual Model

Aldammagh *et al.* [4] and Anggrayani and Suprapti, [6] provided the inspiration for the model that this study built and validated. There are six primary elements influencing the adoption and acceptance of E-payment in the wider TAM (Figure 1). It should be noted that the six hypotheses developed by Pikkarainen *et al.* [45] and Israil *et al.* [24] in their extended TAM research have been used in the current study with some slight modifications. The following hypotheses will consequently serve as the basis for this study:

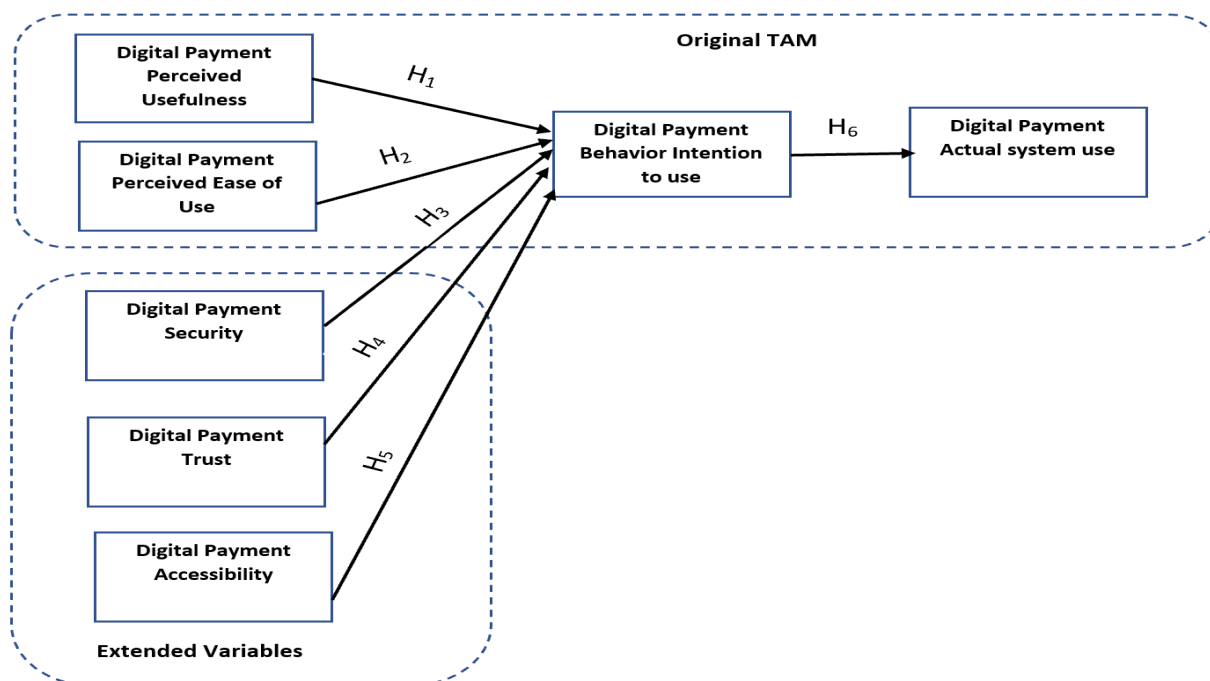


Fig. 1: Proposed Research Conceptual Model

H₁: E-payment Perceived usefulness has a significant positive impact on behavioral intentions to use E-payments by customers in the Kingdom of Bahrain.

H₂: E-payment Perceived ease of use has a significant positive impact on behavioral intentions to use E-payments by customers in the kingdom of Bahrain.

H₃: E-payment data security has a significant positive impact on behavioral intentions to use E-payments by customers

H4: E-payment trust has a significant positive impact on behavioral intentions to use E-payments by customers in the Kingdom of Bahrain.

H5: E-payment accessibility has a significant positive impact on behavioral intentions to use E-payments by customers in the Kingdom of Bahrain

H6: The behavioral intention to use of E-payments has a significant positive impact on an E-payment customer's actual system usage.

3 Methods

3.1 Data Collection

Customers of E-payment services in the Kingdom of Bahrain were surveyed using a self-administered questionnaire; the sample was comprised entirely of people who have used those services through an online channel. The online survey aimed for a sizable cross-section of E-payment users. Therefore, a convenient, purposeful sample representative of the population was selected for this study.

There were 530 surveys sent out, and 397 responses were returned. As a result of their completeness and accuracy, these answers were incorporated into the study. A five-level Likert scale ranking is utilized to quantify the degree to which the responses agree or disagree with the question's statement. Overall, 384 out of the 384 people in the sample responded. This corresponds to a 75% response rate. SPSS and AMOS were used to conduct statistical analyses on the acquired data. To begin, we used descriptive statistics to see the big picture of the population data. Subsequently, Structural Equation Modeling was used to inferentially examine the data (SEM). The current study's important SEM phases were confirmatory factor analysis (CFA) and full-fledged structural equation modeling, ultimately resulted in testing hypotheses.

3.2 Demographic Data Analysis

To fully understand a specific population, it is necessary to have access to demographic data. Examining the demographic information gathered in the survey used in this study is presented below. In Table 2 you'll see the breakdown of the respondents by gender, age, and education. Next, a detailed explanation of each demographic data collection is provided.

Table 2: Demographic Data

Category	Item	Frequency	Percentage
Gender	Male	220	55.4%
	Female	177	44.6%
Age	18 - 34 years old	209	52.6%
	35 - 54 years old	150	37.9%
	Above 54 years old	38	9.5%
Education	High School	28	7.1%
	Bachelor's Degree	297	74.8%
	Master's Degree	58	14.6%
	PhD	14	3.5%

Approximately 55.4% of the sample were males and 44.6% were females. There were three age brackets defined. First, there are the young adults (18-34) who account for 52.6% of the population; second, those aged 35-54 who make up 37.9%; and third, those aged 55 and more who account for 9.5%. Most of the sample clearly consisted of younger people (those under the age of 34). Participants were divided into four groups based on their level of education: those with a bachelor's degree made up 74.8% of the total, those with a master's degree made up 14.6% of the total, and those with a doctorate made up 3.5%. Evident from the statistics above, most participants possess at least a bachelor's degree, which may account for the fact that the largest age group consisted of those between 18 and 34.

3.3 Reliability and Consistency Test

Cronbach's alpha is used to determine the degree to which different sets of survey questions are reliable and valid. To evaluate the questionnaire's reliability, Cronbach's alpha was computed. According to recent research (Bonet and Wright [11]), the minimum acceptable value of Cronbach's alpha for a trusted question pool is 0.70. E-payment security, E-payment trust, and E-payment accessibility all had alpha values of 0.94 and 0.96, respectively, whereas perceived utility, perceived ease of use, and behavioral intention to use E-payment items had alpha values of 0.93, 0.92, and 0.94, respectively. Cronbach's alpha was calculated, and the total value was 0.95, which indicates that the instrument is reliable and valid.

4 Results

4.1 Confirmatory Factor Analysis (CFA) and Model Fit Test

CFA preceded comprehensive structural modeling, following Byrne [12] and Hair *et al.* [21] proposed two-stage modeling approach to simplify and accurately fit the structural model after the measurement model is described and fitted. Before fitting a structure model, the measurement model is specified and fitted. Therefore, AMOS software is utilized to perform CFA on all measuring parameters. The chi-square (X^2) value, df, and at least one iterative and absolute index was all recommended for publication by Byrne [12] and Hair *et al.* [21]. It is reported by Hair *et al.*, [21] that the value of X^2 , degree of freedom, Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) provide enough unique information to evaluate a model [21]. All goodness-of-fit metrics (CMIN/df, GFI, CFI, TLI, SRMR, and RMSEA) employed to evaluate the model were statistically significant in this study. Table 3 demonstrates that the data fit well with the Extended TAM five component model (E-payment perceived usefulness, perceived ease of use, behavioral intention to use, data security, trust, and accessibility) with the values: CMIN/df = 3.512, GFI = 0.910, CFI = 0.920, TLI = 0.905, SRMR = 0.066, and RMSEA = 0.056. Figure 2 shows no objectionable estimates, and fit indices validate the model.

Table 3: CFA Model Fit Indices

Fit Indices	Recommended Value	Current Research Value
P	Insignificant	0.000
CMIN/df	3 - 5	3.512
GFI	> 0.9	0.910
CFI	> 0.9	0.920
TLI	> 0.9	0.905
SRMR	> 0.08	0.066
RSMEA	< 0.08	0.056

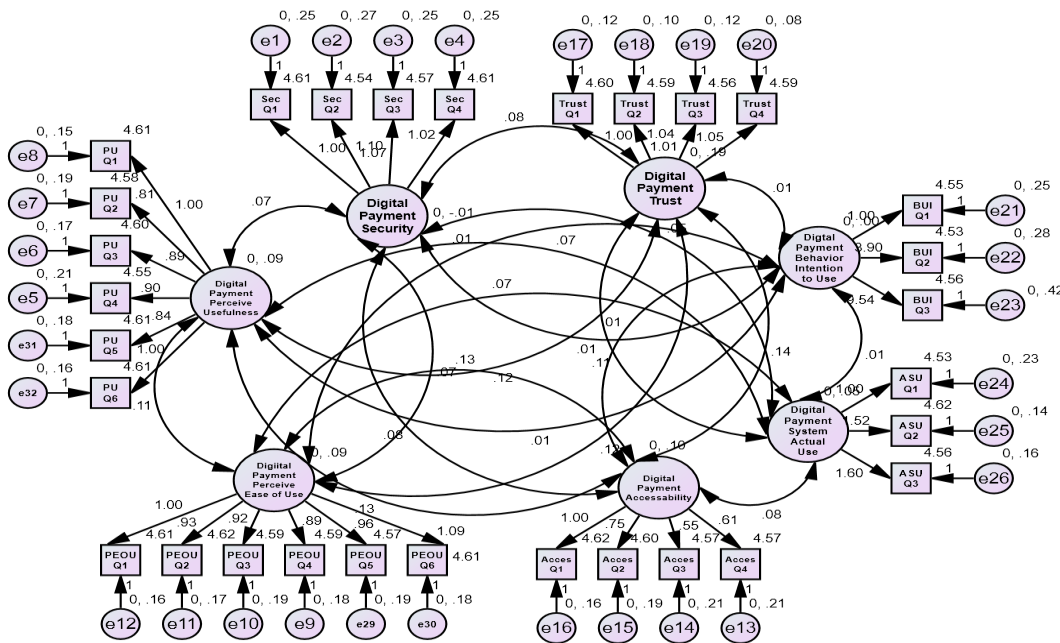


Fig. 2: Confirmatory Factor Analysis Model

After fitting the measurement model well, structural equation modeling with Maximum Likelihood Estimates (MLE) was used to assess the hypothesized causal link between model constructs.

4.2 Structural equation modeling

Figure 3 depicts the structural baseline. Hair *et al.* [21] suggested using the chi-square test, Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA) to evaluate the model (2010). Statistics ($p < 0.05$) and practicality ($\beta > 0.20$) were also considered. Figure 3 shows this structural model's data-fitting outcome. CMIN/df was 2.788, CFI was 0.881, and RMSEA was 0.067.

Table 4 details this baseline model's outcomes. The postulated model supported all hypothesis at $p < 0.001$ and $p < 0.05$.

Table 4: Estimates Baseline Model Outcomes

Structural Path	Hypothesis (results)	Regression Weight	Significance	Critical Ratio	P
BUI ← PU	H ₁ - Supported	1.098	0.126	8.687	***
BUI ← PEOU	H ₂ - Supported	0.068	0.022	3.030	0.002
BIU ← Security	H ₃ - Supported	0.617	0.064	9.634	***
BIU ← Trust	H ₄ - Supported	0.433	0.190	2.283	0.022
BIU ← Accessibility	H ₅ - Supported	0.262	0.050	5.217	***
ASU ← BIU	H ₆ - Supported	1.708	0.333	5.123	***

PU = Perceived Usefulness; PEOU = Perceived Ease of Use; BUI = Behavioral Intention to Use

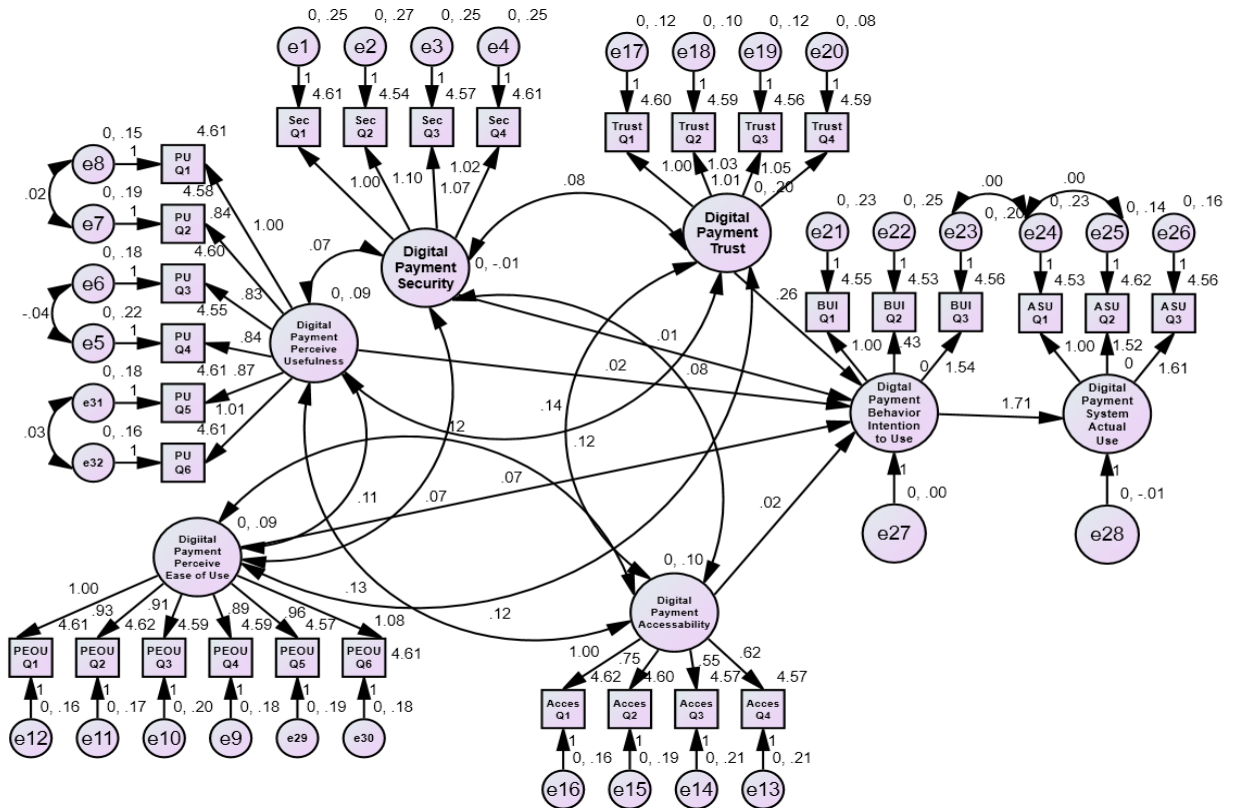


Fig. 3: Structural Equation Model

5 Discussion

This study identified the factors that influence customers' attitudes toward E-payments and determined the underlying causal relationships among the factors using the proposed extension of the original TAM framework. By collecting data from a sample of 530 E-payment customers in the Kingdom of Bahrain, 397 viable responses were collected for further analysis. The study results generally supported the proposed model with minor revisions and confirmed the significant influence of perceived ease of use, perceived usefulness, trust, security, and accessibility on the use of E-payment by customers in the Kingdom. Research hypotheses were tested after a descriptive analysis was conducted to identify patterns in the data and a subsequent inferential analysis using structural equation modeling (SEM) with confirmatory factor analysis (CFA) and full-fledged structural equation modeling. Kingdom of Bahrain banking customers are more likely to adopt E-payment methods if both factors are present. E-payment systems the behavioral intention to use was also highly influenced by aspects including security, trust, and ease of use. To verify the extended TAM conceptual model, this research has turned to innovative methods, including structural equation modeling. This study also deepens our familiarity with the TAM from the customer's point of view, and the verified model can be used in further studies.

6 Conclusion and Recommendations

This study identified and quantified Bahraini customers' E-payment acceptance variables. A literature review identified

and investigated elements that may affect customers' acceptance of E-payments, develop a model of hypotheses, and establish the study's methodology.

The research found that most Bahraini customers prefer E-payments due to their many benefits. Descriptive analysis showed that most Bahrainis use E-payment methods. This study indicated that respondents aged 35 and up strongly favor E-payment methods, which is consistent with the findings of earlier research work by Jin *et al.* [27] and Vaportzis *et al.* [54], which discovered that customers frequently make digital banking transactions. Comparable to the findings of Yates [57], which found that a higher level of education increases the likelihood of adopting digital services provided by the banking sector, the current study, respondents with a bachelor's or higher degree use different means of E-payments more frequently than respondents with a lower degree of education.

The inferential statistical analysis of the study revealed some interesting findings. The research has concluded that TAM's Perceived Usefulness of E-payment is significantly impacting TAM's Behavioral Intention to Use E-payment, and this is in line with the results of [22]. Furthermore, the findings suggest that TAM E-payment perceived ease of use has a positive and significant impact on TAM behavioral intention to use E-payment, which is consistent with Vinita and Vasantha [55] research. A more interesting and valuable finding is the significant positive impact of Extended TAM E-payment Security on TAM Behavioral Intention to Use E-payments, and this is in line with a study conducted by [51]. The study also revealed that the Extended TAM E-payment Trust has a positive and significant impact on TAM E-payment Behavioral Intention to Use which also shows consistency with a research study conducted by [55]. Another finding was the existence of a positive and significant impact of Extended TAM E-payment accessibility on TAM E-payment Behavioral Intention to Use. Finally, the result of the study showed that there is a positive and significant impact of E-payment Behavioral Intention to use on the Actual System Usage showing total congruence with the study conducted by Muluka *et al.* [36].

In conclusion, the widespread use of E-payment systems is indicative of the market's willingness to adopt new payment technologies, suggesting that Bahrain's economy could stand to gain from the introduction of even more E-payment systems. According to the results of the research, client acceptance of a service is highly dependent on their perception of its security. In addition, the trust factor should be considered in the operational aspects of a new E-payment service, as studies have shown that such a service is more likely to attract and keep users if it successfully completes the necessary mission.

7 Limitations and future studies

This study confronted various hurdles and constraints. There was no genuine public information accessible on overall E-payment service usage by clients, and there were no databases of all the non-sensitive information related all E-payment services. The second limitation, which gave an opportunity for performing this research, was the lack of studies in the topic in the Kingdom of Bahrain.

The variables influencing the adoption of E-payment services could be the subject of future research. Future studies may investigate other characteristics that could influence E-payment acceptability. They should evaluate the competitive advantage of incorporating these aspects into their services.

Conflict of interest

The authors declare that there is no conflict regarding the publication of this paper.

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