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Article

The role of e-banking, mobile-banking, and e-wallet with response to e-payment and customer trust as a mediating factor using a structural equation modelling approach

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Abstract: The objective of this research is to assess the current state of e-banking in Saudi Arabia. The banking industry is rapidly evolving to use e-banking as an efficient and appropriate tool for customer satisfaction. Traditional banks recommend online banking as a particular service to their customers in order to provide them with faster and better service. As a result of the rapid advancement of technology, banks have used e-banking and mobile banking to both accumulate users and conduct banking transactions. Nonetheless, the primary challenge with electronic banking is satisfying customers who use Internet banking. Thus, the current study seeks to determine what factors affect e-payment adoption with e-banking services. mobile banking, e-wallets, and e-banking, as well as the mediating role of customer trust, can drive e-payment adoption. We distributed the survey online and offline to a total of 336 participants. A convenience sampling technique was used; structure equation modeling (SEM), convergence and discriminant validity; and model fitness were achieved through Smart PLS 3. The findings have shown that mobile banking, e-banking, and e-wallets are three significant independent variables that mediate the role of customer trust in influencing e-payment adoption when using Internet banking services. They should emphasize trust-building activities, specifically in relation to the new ways of e-payment such as e-banking, m-payments, NFC, and e-proximity, which will further help reduce consumer perceptions of risk. The system developers should design user-friendly applications and e-payment apps to enhance consumers' belief in using them for payment purposes over any Internet-enabled device. They should promptly respond to consumers in cases of failed e-payment transactions and be able to promptly demonstrate transparency in settling claims for such failed transactions. Future studies could benefit from implementing probability sampling to facilitate comparisons with non-probability sampling studies. This study selected responses from only Saudi Arabian adopters of mobile payment technology. We need to conduct research on non-adopters and analyze the results using the model we proposed in this study. Due to time and resource constraints, in depth research using a mixed-methods approach could not be conducted. Future studies can utilize a mixed-methods approach for further understanding.

Keywords: e-banking; mobile banking; e-wallet; customer satisfaction

1. Introduction

The rapid advancement of information technology has enabled bank customers to maintain a stronger connection to their accounts via the Internet and mobile devices (Blount et al., 2004). Although e-banking consists of several stages, the primary distinction between them is the hardware, software, and financial

information processing systems available (Kamel and Hassan, 2006). Contemporary information technology facilitates the optimal amalgamation of various banking operations in internet banking, enabling the provision of a comprehensive range of services tailored to meet consumer demands. However, the majority of experts are concerned with integrating all activities and customer orientation through the use of hardware, software, and network technologies (Alkhowaiter, 2020). Internet banking involves a number of tools, such as mobile banking, an electronic wallet, an electronic check, electronic money, and various types of cards, such as credit cards, debit cards, ATM cards, expense cards, and POS (point of sale) systems (Anouze and Alamro, 2020). The establishment of internet banking requires the implementation of various components, including hardware and software infrastructures, legal and cultural frameworks, customer relationship management systems, and human resource management. However, it is worth noting that traditional banking continues to be the prevailing approach for carrying out financial transactions in the majority of countries. Numerous countries have invested heavily in the development of e-banking systems (Dharmavaram and Nittala, 2018). Despite reports indicating that potential consumers have access to Internet banking services, the lack of utilization has raised concerns within the banking industry. Consequently, in order to enhance marketing strategies, it is imperative to ascertain the determinants that impact individuals' inclination towards utilizing Internet banking services (Mujinga, 2020). Furthermore, users' attitudes toward emerging information technology play a critical role in determining the level of success achieved in the adoption of such technology. Therefore, it is imperative to comprehend the various aspects that shape their viewpoints.

The advent of e-commerce, as well as advancements in the financial and banking sectors, have made it easier for customers to access online banking (Fojt, 2016). Thus, the world's largest new banking system has made significant achievements in developing and enabling access to banking services, as well as ensuring e-payment adoption. The concept of client-centricity is gaining prominence in the adoption of electronic banking systems, driven by the bank's ongoing economic cycle, the significance of customer engagement for financial institutions, and the imperative of investing in human resources (Usman et al., 2020). We should also consider the central bank's marketing strategy. E-payment adoption is a measure of how satisfied a customer is with a product or service. Moreover, companies employ customer satisfaction (CS) as an evaluative measure to assess the long-term behavioral patterns of customers and consider it a pivotal element in marketing endeavors (Cohen and Gan, 2006). In contrast, satisfaction refers to the consumer's perception and evaluation of the service provider. Furthermore, customer service (CS) proves to be advantageous for individuals who have made a financial transaction for a certain product or service or have experienced the benefits of services or products due to marketing endeavors (Santouridis and Kyritsi, 2014).

Furthermore, information and communication technology (ICT) and online databases have significantly altered information and communication transfers. Economic researchers' studies have also shown that increasing CS and loyalty increases bank profitability. Internet banking, mobile banking, and e-wallet banking are practices that provide clients with uniform access to banking services through a

secure financial intermediary without the need for physical presence. The majority of banks now operate in a highly volatile environment. Moreover, as a result of the swift fluctuations in competitive standings and market dynamics, banks of all sizes are currently prioritizing the acquisition and retention of commercial customers (Khan, 2021). Customers can compare banks' technology, speed, and technical expertise as key determinants of competition. Banks spend a lot of money on the Internet infrastructure. In e-banking, e-payment adoption and maintenance are becoming the most important success factors. E-banking and mobile banking are making it harder for current bank managers to come up with long-term strategies for dealing with and promoting e-payment adoption. Additionally, CS is a critical factor in preserving a bank's competitive edge (Nagar and Ghai, 2019). Although it is true that existing clients are more financially advantageous for banks compared to potential consumers, it is imperative to take customer satisfaction elements into account when delivering electronic banking services. In addition, cloud computing is a dependable solution for modernizing business operations. Even in the absence of Internet connectivity or short-term customer structure usage, it maintains its value. Cloud computing has the potential to benefit the banking industry. As we continue to explore this domain, challenges such as the scarcity of cloud computing have surfaced (Tetteh, 2020). Moreover, the question is when and how the bank should proceed in this area. These issues are dependent on a number of parameters and necessitate further investigation by the bank's research and development. The goal of this paper is to thoroughly explain how mobile banking, e-banking, and e-wallet cloud computing affect e-payment adoption, as well as the mediating role of customer trust in the electronic banking industry (Raza et al., 2020).

Previously conducted research has identified e-banking and cloud services as important factors in e-payment adoption with e-banking services. In addition to e-banking and mobile banking, this study looked at two variables: e-wallets and the mediating role of customer trust (Toor et al., 2016). Furthermore, this study investigates variables previously unexplored in developing countries. The main goal of this study is to come up with a general way to look at how e-banking services affect CS.

Current literature has not thoroughly explored the importance of intrinsic research motivation in producing high-quality findings. To better understand what drives academics to conduct research, this study used a constructivist version of grounded theory. This study promotes quality research, a crucial aspect for knowledge advancement, university research management, and academic advancement (Minhaj et al., 2024).

- Research gap

Research on customer experience shows that there is a lack of studies measuring consumer trust immediately following digital service experiences. In this regard, the primary objective of this study's is to find out which elements influence service encounter usage experiences during a particular service encountering of e-payment services. First research is done in the area of e-banking, mobile banking, e-wallet and trust relating to e-payment. Hence this topic researchers have recognised the significance of the problem and planned to have extensively worked on it.

- Objectives

1) To study the relations between e-banking and e-payment.
2) To explore the impact between mobile banking and e-payment.
3) To study the application between e-wallet and e-payment.
4) To study the application between customer trust and e-payment.

2. Theoretical background and research framework

Electronic banking, or "e-banking," is the practice of handling financial matters using the Internet. E-banking encompasses any electronic banking service that eliminates the need for the customer's physical presence in a specific location. The term "e-banking" often refers to the process of transferring money into the banking system through network telecommunications. Various factors, such as information management, communication systems, and data transfers, significantly influence the completion of banking operations with many electronic and communication devices, including "PCs, mobile phones, ATMs, laptops, and POS terminals." to presenting the conceptual framework and hypotheses, this section reviews relevant literature (Khan et al., 2022).

Using a literature review (Mbukanma et al., 2020), we investigated the relationship between electronic banking transactions and customers' knowledge of bank services and products. They employed the literature review methodology in their investigation. The more knowledgeable customers who participate in available e-products and services, the greater the usage, according to the findings. A lack of awareness and information about e-products and services prevents customers from adopting and using platforms that are widely available.

Table 1. A summary of the articles that have been reviewed.

Article	Main idea	Advantages	Disadvantages
(Mbukanma et al., 2020)	Facilitating enhanced electronic banking for consumers through the establishment of a structured platform for acquiring knowledge about bank products and services (e-banking).	• Facilitating the bridging of knowledge gaps among banks and their management through the provision of a comprehensive framework for consumer education and the bridging of existing knowledge gaps.	Customers' knowledge and level of awareness are not taken into account.
(Sharma and Sharma, 2019)	The "DeLone and McLean's Information Systems Success (D&M IS)" model was employed to gain an understanding of the behaviour of mobile banking users.	• Examining mobile banking to enhance comprehension of consumers.	We only use academic institutions in the Sultanate of Oman to gather data.
(Shahid Iqbal et al., 2018)	CS, loyalty, and behavioural intentions are all being examined in relation to SSTs.	• Insights from the literature on SSTs in the field of service marketing. • Understanding how customers feel about the use of SSTs is essential.	• Data gathering through the use of surveys. Inability to use a representative sample of all customers.
(Asadi et al., 2016)	The utilisation of an assessment instrument such as the TAMDTM has the potential to enhance customers' attitudes regarding the adoption of cloud computing in the banking sector.	Developing a framework for prospective investigations.	Using an inadequately sized sample.
(Iberahim et al., 2016)	The quality of ATM service provided by banks in Malaysia is being evaluated.	Providing managers with the means to improve ATM services.	The statistical community has set certain constraints.

Table 1. (*Continued*).

Article	Main idea	Advantages	Disadvantages
(Ling et al., 2016)	Internet banking can be used to research and identify factors that influence CS.	Facilitating the enhancement of e-payment adoption ratings for financial institutions.	Using an insufficient sample size.
(Ayo et al., 2016)	Modeling the behaviour of banking customers.	• It has been shown that service characteristics play a significant role on customer satisfaction.	Limiting the age of responders to those who are at least age of 18.
(Ur Rehman and Ali Shaikh, 2020)	This study aims to examine the impact of Technology Acceptance Measurement (TAM) on the uptake of mobile banking.	• User satisfaction with the system and mobile banking usage is experiencing tremendous growth.	Neglecting to consider variables such as financial stability and potential hazards.
(Ahmed et al., 2010)	A critical examination of previous researchers' work.	• Improving CS • Gaining more finance. • Reducing expenses over time.	Concentrating on research conducted during a particular time period.
(Casaló et al., 2008)	Utilised a structural equation questionnaire (LISREL) to examine the significance of satisfaction.	Enhancing CS by optimising the user interface of the influencer website.	A cross-sectional study.

It investigated the relationship between customer trust and the use of banking services (Sharma and Sharma, 2019). We used the questionnaire data to validate and analyze the research model. The current study combined "structural equation modeling (SEM)" and neural network analysis in a two-step analytical procedure. According to the results, there is a strong correlation between intention and satisfaction with banking services. Customers' satisfaction and desire to use e-banking have acted as moderators in the quality of information, service, system, and customer trust summary showing in **Table 1**.

Self-service technologies (SSTs) were studied by Shahid Iqbal et al. (2018) in Pakistan's service sector to see how they affected customer behaviour, loyalty, and satisfaction. The study employed an online survey to gather responses from the 238 participants. We performed structural equation modeling using the LISREL software system. SST loyalty, service quality, and behavioural intentions were found to be linked directly and indirectly through customer satisfaction.

Customers' preferences in cloud computing were examined by Asadi et al. (2016), in the banking industry. Using this model, they were able to select this target. An inquiry was used to gather data, and the Partial Least Squares method was used to analyse the results (PLS). Privacy and security features boosted perceived usefulness, customer trustworthiness, and usability. The utilisation of M-banking by customers is determined by various aspects, such as their perception of the simplicity of use, cost, utility, customer trust, and attitudes towards m-banking (Khan et al., 2023).

Reliability, responsiveness, customer satisfaction, and factors influencing service improvement were examined by Iberahim et al. (2016), The study was carried out by Malaysian researchers. Additionally, the researchers asked 271 people to complete a survey, gathering data by taking pictures of the services they used. The data was analysed using SPSS software. According to the study's findings, dependability, and punctuality were found to be important factors in achieving the highest possible CS.

Additionally, Ling et al. (2016) investigated the determinants of CS in Malacca. The data collection instrument was a questionnaire (200 participants). This study identified five factors—"service quality, web and content design, security and privacy, convenience, and speed"—that impact the adoption of electronic payments through Internet banking. The study revealed that factors such as service quality, privacy and security, content and web design, speed, and accessibility influence customer satisfaction.

E-banking service use was examined by Ayo et al. (2016). in their research on customer attitudes, customer satisfaction, and the perceived quality of e-services. According to the research, customers' attitudes are positively influenced by the quality of electronic services. Customers' attitudes are also influenced by the company's comparative advantage. However, complexity and adaptability have little effect on customers' attitudes. Traditional service quality attributes such as service expertise and sample size were found to be just as important as previously thought in the online environment, according to the study's findings. E-service quality has been shown to have a significant impact on customers' perceptions of e-banking.

In addition, the research conducted by Ur Rehman and Ali Shaikh (2020) examined the Malaysian e-banking evaluation criteria. We conducted analyses in AMOS version 21 using SEM. The results indicated that users' perceptions of benefit, credibility, and utility influenced their decisions to use mobile banking. The current investigation found the perceived financial cost and ease of use to be unimportant (Khan and Minhaj, 2022).

Consumer behaviour and the quality of e-services were studied by Ahmed et al. (2010). The quality of e-banking services increases the adoption of e-payments, which in turn reduces costs and boosts revenue. The increasing adoption of the Internet as a rapid delivery route is leading to a progressive reduction in overhead expenditures, including marketing and staffing costs.

Casaló et al. (2008) also investigated how the adoption of e-payments through e-banking websites, along with the potential for increased customer loyalty and positive news explosions, influenced their findings. According to the findings, customers' loyalty to a bank increase when they are pleased with their previous experiences with the bank's website. Furthermore, a website's availability improved customer satisfaction. As expected, the good news bomb had an effect on loyalty.

3. Definitions of variables, conceptual model, and research hypotheses

Under this section, the research conceptual model and hypotheses are presented after determining the variables and sub-indicators.

3.1. Mobile banking

Mobile banking is a service provided by a bank or financial institution that allows its customers to conduct financial transactions remotely using a mobile device such as a smartphone or tablet. This service typically involves the use of a mobile banking app provided by the bank (Khan and Minhaj, 2021).

In this context, "service" refers to a feature offered by m-banking refers to the services provided by a bank or other financial institution that allow their clients to manage their accounts and conduct transactions using a mobile device, such as a smartphone or tablet, rather than by accessing a physical location (Tetteh, 2020). In contrast to conventional internet banking, this approach utilizes dedicated applications created by the corresponding financial institution. Mobile banking is typically available around the clock. Various financial organizations put limits placed on certain accounts can be accessible via mobile banking, as well as a maximum transaction amount. Mobile banking features include the ability to bank anywhere and at any time (Raza et al., 2020).

The integration of Information and (ICT) with the physical world has occurred as a result of the widespread presence of the Internet and its continual expansion, along with significant advancements in speed, portability, compactness, and computational capabilities. These developments have facilitated the creation of intelligent or smart systems (Kim, 2017). In addition to enabling previously unachievable functions, it increases efficiency, safety, productivity, and speed (Liu et al., 2022). This pool can be made up of existing processes and new ones in order to provide elastic services over the Internet. It has the potential to boost efficiency, increase fault tolerance, increase business agility, and lower costs (Liu and Wang, 2022).

- Virtualization of resources: It's a technology which enables to run multiple operating systems on a single mobile phone "(CPU, memory, storage, network card, etc.)".
- Ease of use: Whenever a system meets the user's requirements, it is put to use. It is easy to learn, useful, "user-satisfaction, ease-of-use, and quality" are all aspects of usability (Navimipour and Eslamic, n.d.). In other words, the term "ease of use" refers to the belief that an information system's operation can be learned with little effort (Naseri and Jafari Navimipour, 2019).
- Cost flexibility: Customers who utilize mobile banking have the ability to conveniently modify their allocated resources and associated expenses in response to evolving requirements.

H01: There is a significant relationship between mobile banking and customer trust.

H02: There is a significant mediating role for customer trust between mobile banking and e-payment adoption.

3.2. E-wallet users

An electronic wallet, or e-wallet, is a digital system that stores users' payment information and passwords for numerous payment methods and websites. It allows users to make electronic transactions quickly and securely. E-wallets can be linked to a bank account or a credit/debit card and are typically accessed via a smartphone app .

E-wallets can be computer programs, hardware wallets, or web-based services that facilitate electronic financial transactions. Users' information for a variety of online payment systems, along with other stuff like gift certificates and IDs, are

stored there. The term "digital wallet" refers to a similar concept (Toor et al., 2016). E-wallets are predominantly utilized as mobile applications; however, they can also be accessed via desktops. The mobile variant of the digital wallet application garners the highest number of downloads due to its inherent convenience and portability. This information is required so that the wallet's owner can make purchases online or at retail locations (Mbukanma et al., 2020).

Individuals can now conduct cooperative learning in a remarkable and efficient manner from any location and at any time thanks to the advancements in information technology (Tan et al., 2017). Despite this, technology alone is not sufficient for knowledge transmission, as people play a critical role in creating and disseminating information. E-wallet can be used in a variety of ways, in different industries, and by a variety of people (Sundaresan and Zhang, 2016). It's also a way for people to learn new things and get better at what they do. There are three sub-indicators in the e-wallet user variables: system availability, flexibility in terms of time and location, and skill utilisation (Dharmawansa et al., 2013).

- System availability: In e-wallet systems, the use of distributed databases increases information availability and speeds data collection (Nicoleta-Magdalena, 2011). Although they improve the reliability and accessibility of data, they also perform well in data processing and lower costs.
- Temporal and spatial flexibility: One of the most appealing aspects of e-wallet is its ability to accommodate learners of all ages and schedules. E-wallet, which allows students to receive instruction at any time and from any location, has eliminated the need for students to travel to and from class. It is also possible to increase student satisfaction and save time by adapting the online learning environment to our circumstances (Arbaugh and Duray, 2002).
- Using skill: Satisfaction is primarily determined by computer skills. Consumer satisfaction can be achieved when individuals hold the belief that technology is both user-friendly and beneficial to their needs.

H03: There is a significant relationship between e-wallet and customer trust.

H04: There is a significant mediating role of customer trust between e-wallet and e-payment adoption.

3.3. E-banking

Electronic banking, commonly known as e-banking or online banking, refers to the use of electronic means to conduct banking transactions and manage financial accounts. This service allows customers to perform various banking activities such as transferring funds, checking account balances, paying bills, and accessing a wide range of financial services via the internet.

The word "e-banking" refers to a wide range of financial services, from online and mobile banking to national electronic funds transfer systems (NEFT) and instant payment system (IMPS). Electronic banking, or e-banking, is a secure method of conducting financial transactions online (Sharma and Sharma, 2019). The utilization of electronic banking simplifies non-financial banking activities, including but not limited to modifying one's ATM Personal Identification Number (PIN), acquiring a concise account summary, revising personal information, inquiring about available

funds, or generating an account statement (Rubin et al., 2013). Simply said, it's a term used to describe any action taken that doesn't entail the addition or subtraction of money from your account (Yan et al., 2015).

E-commerce and size have exploded in the last decade thanks to advances in information technology (Tabernero et al., 2015). It is imperative that all banking channels have a strategy in place to achieve high e-payment adoption. E-payment adoption is impacted as a result of this (CS) (Meesala and Paul, 2018). Researchers have found several aspects that contribute to the success of online purchasing. These elements include simplicity of use, product features, consumer traits and situational circumstances, utility, enjoyment, and customer trust. Additionally, previous online shopping experiences have also been considered (Arshad et al., 2021).

Concentrating on e-banking on e-payment adoption and enhancing product quality go hand in hand (Al-Saedi et al., 2019). Owing to its dependability and durability (Al-Emran et al., 2020), e-banking (Albanna et al., 2022) has a stronger impact on the development of the banking business (Khan and Alhumoudi, 2022). In many businesses, but especially in the service industry, the capacity of a business to maintain e-payment adoption is crucial (Khan et al., 2021). Customer wellbeing is based upon purchasers paying for and utilizing the purchased goods or services (Al-Emran and Mezhuyev, 2020).

H05: There is a significant relationship between e-banking and customer trust.

H06: There is a significant mediating role of customer trust between e-banking and e-payment adoption.

3.4. Customer trust

Customers' expectations and service comprehension differ, and this variance contributes to customer trust. E-payment adoption is evident if performance exceeds expectations in terms of both rate and quality (Hussain et al., 2015). There has been a lot of evidence to show that e-payment adoption and customer trust are directly linked. For e-banking to be a success and to have happy customers, the quality of the system's service is critical. The best servers are those that can deliver data quickly and reliably (Parasuraman and Grewal, 2000). Additionally, e-payment adoption will rise as a result of this. User friendliness, cost efficiency, and technical support all fall under the customer trust variables.

- Cost-effectiveness: To earn money, one must pay for the items or services needed. The definition of cost-effective is a product or service that is worth at least what is spent on it in terms of benefits and usage.
- User friendliness: User satisfaction is directly related to the ease of use of an electronic system. Users will find an attractive environment if they are able to interact with people and other users over the Internet in a time and place that is convenient for them. Consequently, their contentment is likely to result.
- Technical support: Support for information and communication technology (ICT) has two components: support for end users and support for management. Product or service-related problems can be addressed by technical support services (Lee and Kim, 2008). The technical customer trust support facilitates seamless user interaction, feedback provision, and feedback reception. This help

can be availed on a regular or technical basis. Customer service is available by email or phone if there is an issue with the service, which is sure to please the customer.

H07: There is significant relationship between customer trust and e-payment adoption.

3.5. Electronic-payment

The term "e-payment" can be used to refer to the process of safeguarding customers' personal information and privacy. Security protection for business information systems is a precondition for the successful completion of any IT project (Howe et al., 2015). If banks had secured electronic payment systems in place, they could safeguard their customers' financial and personal information, particularly when conducting online banking transactions. Additionally, they can use this method to increase CS and trust (Tsai et al., 2014). The terms "privacy," "integrity," and "digital signature" refer to sub-indicators of the security variables associated with electronic payment systems.

The majority of today's shoppers base their purchasing decisions on internet content that has been supplied or traded by other customers (Al-Sharafi, Al-Emran, Arpaci, et al., 2022). Furthermore, internet banking has a tremendous impact on consumers' brand awareness, feelings, and thoughts (Al-Sharafi, Al-Emran, Iranmanesh, et al., 2022); as it is common knowledge that everyone regularly uses the Internet to make purchases. They aid in the electronic dissemination of information (Al-Sharafi, Al-Qaysi, et al., 2022).

- Privacy: To maintain confidentiality, information must not be disclosed to anyone other than those who have a need to know.
- Integrity: In the context of data integrity, this means preventing unauthorised changes to data and detecting unauthorised changes if they occur.
- Digital signature: The use of digital signatures in security systems is critical, and they are used in many real-world protocols. To guard against malicious nodes, most digital signatures include codes (Bausys and Kriukovas, 2008). To ensure the integrity of a document, an encryption-based digital signature uses electronic information to identify the document's author.
- Theory integration: Researchers studying e-banking must recognize the logical reasoning driving customer uptake in industrialised countries. To address this problem, scholars have proposed many models and frameworks, such as the diffusion of innovation (DOI) and the technology acceptance model (TAM), to provide insight into the logical basis for client acceptance.

Therefore, it is essential to modify and adapt the TAM model to incorporate certain external elements that align with the particular characteristics of e-banking services. This will help to better understand and explain how customers adopt e-banking practices.

However, the development of a new technological service, like e-banking, does not solely determine its success. Instead, it depends on the rate at which individuals are willing to use the service, also known as the adoption rate. Therefore, it is crucial

to consider the external factors that influence the adoption of new technological services.

Previous research has defined the qualities of new technical services using notions such as relative benefit, innovation information, compatibility, image, observability, social acceptance, trialability, visibility, and voluntariness. Therefore, by combining these fundamental factors that determine the characteristics of new technical services with respect to e-banking, we can gain an understanding of what drives customers to select a certain service.

Research has highlighted the importance of innovation characteristics and the need to modify the TAM model. However, no studies have actually incorporated these promising constructs into the TAM extension model to provide a more comprehensive understanding of the influence of the TAM extension model on customer adoption, particularly in relation to e-banking practices in Lagos State. This study proposes further empirical research by expanding the technology acceptance model (TAM) to incorporate several interesting factors related to innovation features. The aim is to gain a better understanding of how these constructs influence customer acceptance of e-banking practices in Lagos State. We integrated four factors—innovation relative advantage, innovation compatibility, innovation complexity, and innovation information - into the TAM model to expand its scope.

4. Research methodology

4.1. Pre-testing of the instrument

A pilot study was carried out using a limited sample size of 50 participants to assess the questionnaire's dependability. In addition to assessing reliability, the pilot study facilitated the identification of any necessary modifications to the final questionnaire. Following the assessment of judgmental validity, the reliability of the instrument was evaluated using the Cronbach Alpha and Item correlation correction technique in order to determine the suitability of the questionnaire for the final analysis.

4.2. Sampling and data collection

The population for this study was individuals residing in Saudi Arabia who had some prior knowledge of e-banking, mobile banking and e-wallet as our target population is exclusively comprised of potential early adopters. Convenience sampling was used. There were two modes of completion: an anonymous online form and an offline mode. The form was completed between June 2023 and November 2023. Each person filled out 357 forms. 21 forms were thrown out because they didn't have any previous experience with e-banking.

4.3. Measurement of variables

Each variable's items were quantified using Likert scales ranging from "1 (strongly disagree) to 5 (strongly agree)". The variables used in this study were adapted from those used in previous research to fit the context of this study. In this

study, researchers used mobile banking, e-banking and e-wallet as three significant independent variables that mediate the role of customer trust in influencing e-payment adoption when using Internet banking services.

4.4. Data analysis

To validate the model, we used Smart PLS 3 to specify the measurement scales' reliability, convergent and discriminant validity, and model fitness, as well as to evaluate the structural equation model. To estimate the parameters' significance, we used the software package Smart-PLS 3 with a 3000-sample bootstrapping. The purpose of the study is to predict and identify factors that influence customers' attitudes toward e-payment adoption.

5. Findings and discussion

The assessment consists of a total of 25 questions, which are further categorized into two distinct areas. One section of the study focused on the demographic features of the participants, while the other section was divided into five distinct groups. mobile banking, e-banking, and e-wallet are three prominent autonomous variables that serve as mediators in the relationship between customer trust and e-payment adoption. The analysis of the data collected from the participants was conducted utilizing a summation approach based on a rating scale. It was done on a "five-point scale," with "Strongly Disagree (1)" being the lowest and "Strongly Agree (5)" being the most. Of a total of 357 responses, only 336 were chosen for the study to facilitate data processing. To facilitate the quantitative analysis of the data, the researchers employed Smart PLS 3 software and SPSS (Version 25). This section encompasses the research findings and outcomes.

- Reliability measurement

An instrument is said to be reliable if it gives consistent results when repeated measurements are taken. It is the measurement of stability of scale or instrument for the proposed study (Lake et al., 2009). Cronbach Alpha was applied for checking this purpose.

- KMO and Bartlett's test

The sampling adequacy (KMO) test compares the values of correlations that are partially correlated with each other. The result reveals that KMO is 0.842 and it is more than the "cut off value of 0.50". Thus, the adequacy test suggests that correlations between underlying constructs are sufficient to move for further analysis in **Table 2**.

Table 2. KMO and Bartlett's test.

KMO sampling adequacy		0.842
Bartlett's test of sphericity	Approx. chi-square	76656.1
	Df	404
	Sig	0.00

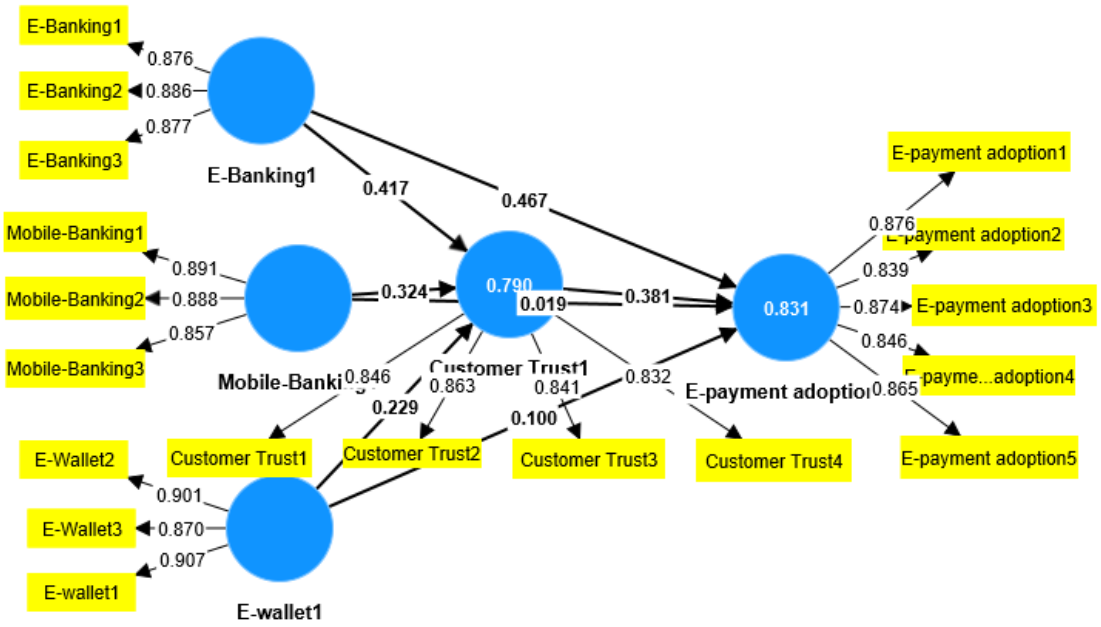

Figure 1. Shows factor loading, Beta values and r-square of items and construct.

In **Figure 1**, mobile banking, e-wallet, e-banking, customer trust, and e-payment adoption are represented by circles since they are the latent constructs used by the researcher in the study. mobile banking, e-wallet, e-banking are measured through three statements codes as 1 to 3, e-payment adoption is measured through five statements codes as 1 to 5, and customer trust is measured through four statements codes as Credibility 1 to 4. The factor loading values are shown near the arrows pointing to the respective items/constructs.

Table 3. The factor loading and *T*-value on the statements related to mobile banking.

S.no	Statements	Factor-loading	*T*-value
1	Rapid information processing has an effect on the growth of Mobile-banking.	0.9084	32.367
2	Mobile-banking result in increased CT by virtue of their widespread availability.	0.9038	32.157
3	Cloud security, the most significant advantage of cloud computing, is becoming increasingly important in the development of mobile banking services.	0.8664	26.292

In the above **Table 3,** the factor loading of each statement of mobile banking is greater than 0.7. So, each statement of mobile banking fulfils the acceptable limit. On the other hand, the *t*-value of each statement of mobile banking must be greater than 1.96. So, each statement of mobile banking fulfils a threshold limit.

Table 4. The factor loading and *T*-value on the statements related to e-wallet.

S.no	Statements	Factor-loading	*T*-value
1	My satisfaction with e-wallet services has increased because of the availability of online training.	0.8901	30.703
2	E-wallet systems offer a wide range of educational opportunities that help me become more knowledgeable and aware.	0.8862	29.231
3	Education in banking systems is well-suited to the needs of individuals who come in a variety of time zones and locations.	0.8597	19.908

In the above **Table 4,** the factor loading of each statement of e-wallet is greater than 0.7. So, each statement of e-wallet fulfils the acceptable limit. On the other hand, the *t*-value of each statement of e-wallet must be greater than 1.96. So, each statement of e-wallet fulfils a threshold limit.

Table 5. The factor loading and *T*-value on the statements related to e-banking.

S.no	Statements	Factor-loading	*T*-value
1	The speed with which services are delivered in e-banking systems is satisfactory.	0.8720	24.886
2	E-banking systems are simple to use, convenient to access, and convenient to use.	0.8885	31.939
3	The cost of providing banking services can be reduced by using e-banking systems technology.	0.8784	28.732

In the above **Table 5**, the factor loading of each statement of e-banking is greater than 0.7. So, each statement of e-banking fulfils the acceptable limit. On the other hand, the *t*-value of each statement of e-banking must be greater than 1.96. So, each statement of e-banking fulfils a threshold limit.

Table 6. The factor loading and *T*-value on the statements related to e-payment adoption.

S.no	Statements	Factor-loading	*T*-value
1	My banking work is done electronically to save time.	0.8465	18.361
2	Customer complaints will be addressed promptly.	0.8629	28.083
3	New electronic services are frequently accessed by system users.	0.8405	21.780
4	All of the electronic banking services that I have used have exceeded my expectations.	0.8319	21.574

In the above **Table 6**, the factor loading of each statement of e-payment adoption is greater than 0.7. So, each statement of e-payment adoption fulfils the acceptable limit**.** On the other hand, the *t*-value of each statement of e-payment adoption must be greater than 1.96. So, each statement of e-payment adoption fulfils a threshold limit.

Table 7. The factor loading and *T*-value on the statements related to customer trust.

S.no	Statements	Factor-loading	*T*-value
1	It is providing speedy refundable mechanism.	0.8743	26.691
2	Strictly regulated and risk-free	0.8400	23.623
3	I rely on the security of an online banking system to keep my personal information safe.	0.8734	29.330
4	Customers can feel confident that their private information will be delivered in a secure manner.	0.8470	23.305
5	I have faith in the electronic banking system to prevent transaction fraud.	0.8649	26.266

In the above **Table 7**, the factor loading of each statement of mobile banking is greater than 0.7. So, each statement of customer trust fulfils the acceptable limit. On the other hand, the *t*-value of each statement of customer trust must be greater than 1.96. So, each statement of mobile banking fulfils a threshold limit.

Table 8 clearly shows that all four constructs met the required threshold limit as the value of "Composite Reliability" (C.R) was above 0.7 and "Average Variance Extracted" (AVE) exceeded 0.5 (Sarstedt et al., 2020). The value of "Cronbach's alpha" and the Rho-a value establishing "internal consistency" was also greater than

0.7 (Adepoju & Adeniji, 2020). Therefore, the convergent validity of the constructs was proved (Khanifar et al., 2012).

Table 8. Convergent validity result.

Factor	Cronbach's alpha	Rho-a	C.R	AVE
Mobile banking	0.9920	0.9128	0.8728	0.7975
E-wallet	0.9105	0.9108	0.8525	0.7722
E-banking	0.9112	0.9113	0.8529	0.7738
Customer trust	0.9342	0.9342	0.9119	0.7397
E-payment adoption	0.9093	0.9091	0.8670	0.7149

5.1. Discriminant validity result

The Fornell-Larcker and cross-loading criteria were examined to check the "discriminant validity". It indicates "the extent to which the measure is adequately distinguishable from related constructs within the nomological net".

Table 9. Discriminant validity-Fornell-Larcker criterion.

Factors	M-banking	E-wallet	E-payment	Customer trust	E-payment adoption
Mobile banking	0.891	0	0	0	0
E-wallet	0.764	0.848	0	0	0
E-banking	0.779	0.719	0.855	0	0
Customer trust	0.793	0.724	0.689	0.873	0
E-payment adoption	0.755	0.791	0.732	0.736	0.821

Table 9 represents the Fornell-Larcker criterion. In this criterion you take the square roots of the "Average Variance Extracted" of the available constructs. The values were as follows: mobile banking (0.891), e-wallet (0.848), e-banking (0.855), customer trust (0.873) and e-payment adoption (0.821) compared to the correlation values between each construct and all other constructions. Thus, discriminant validity was established as per the "Fornell-Larcker criterion" (Fornell and Lacker, 1981).

Table 10. Discriminant validity-loading and cross-loading criterion.

Factor	Mobile banking	E-wallet	E-banking	Customer trust	E-payment adoption
Mobile banking1	0.9084	0.7585	0.7034	0.6978	0.7197
Mobile banking2	0.9038	0.7387	0.6667	0.6675	0.7215
Mobile banking3	0.8664	0.6224	0.7774	0.7596	0.7393
E-wallet1	0.6995	0.8901	0.712	0.621	0.693
E-wallet2	0.6543	0.8862	0.682	0.667	0.713
E-wallet3	0.7321	0.8597	0.764	0.598	0.631
E-banking1	0.667	0.806	0.8720	0.671	0.685
E-banking2	0.682	0.765	0.8885	0.754	0.739
E-banking3	0.681	0.733	0.8784	0.697	0.669

Table 10. (*Continued*).

Factor	Mobile banking	E-wallet	E-banking	Customer trust	E-payment adoption
Customer trust1	0.716	0.681	0.765	0.8465	0.658
Customer trust2	0.698	0.702	0.775	0.8629	0.690
Customer trust3	0.679	0.711	0.754	0.8405	0.768
Customer trust4	0.761	0.635	0.712	0.8319	0.630
e-payment adoption1	0.733	0.703	0.755	0.738	0.8743
e-payment adoption2	0.692	0.781	0.688	0.712	0.8400
e-payment adoption3	0.720	0.798	0.643	0.635	0.8734
e-payment adoption4	0.682	0.761	0.775	0.775	0.8470
e-payment adoption5	0.681	0.733	0.678	0.754	0.8649

Using the "cross-loading criterion" in **Table 10**, all constructions' loadings were higher than the cross-loadings with other constructs across the columns of the model. As a result, the cross-loading criterion was used to determine discriminant validity (Henseler et al., 2014).

Table 11. Discriminant validity Heterotrait-Monotrait criterion.

Factors	Mobile banking	E-wallet	E-banking	Customer trust	E-payment adoption
Mobile banking					
E-wallet	0.714				
E-banking	0.679	0.729			
Customer trust	0.723	0.624	0.659		
E-payment adoption	0.655	0.761	0.762	0.786	

Table 11, depicts the Heterotrait-Monotrait ratio of the constructs and all the constructs had HTMT less than the suggested value 0.9 (Henseler et al., 2014). Thus, the measurement model's discriminant validity was established.

5.2. Structural equation model

Whenever evaluating the structural model, multicollinearity must be examined to ensure that the results are valid**.** The "Variance Inflation Factor" (VIF) values ranged from 1.749 to 2.758, indicating that the model lacked multicollinearity (Akinwande et al., 2015). Following that, the structural model was tested using the bootstrapping approach (3000 resamples) to determine the relevance of the hypotheses.

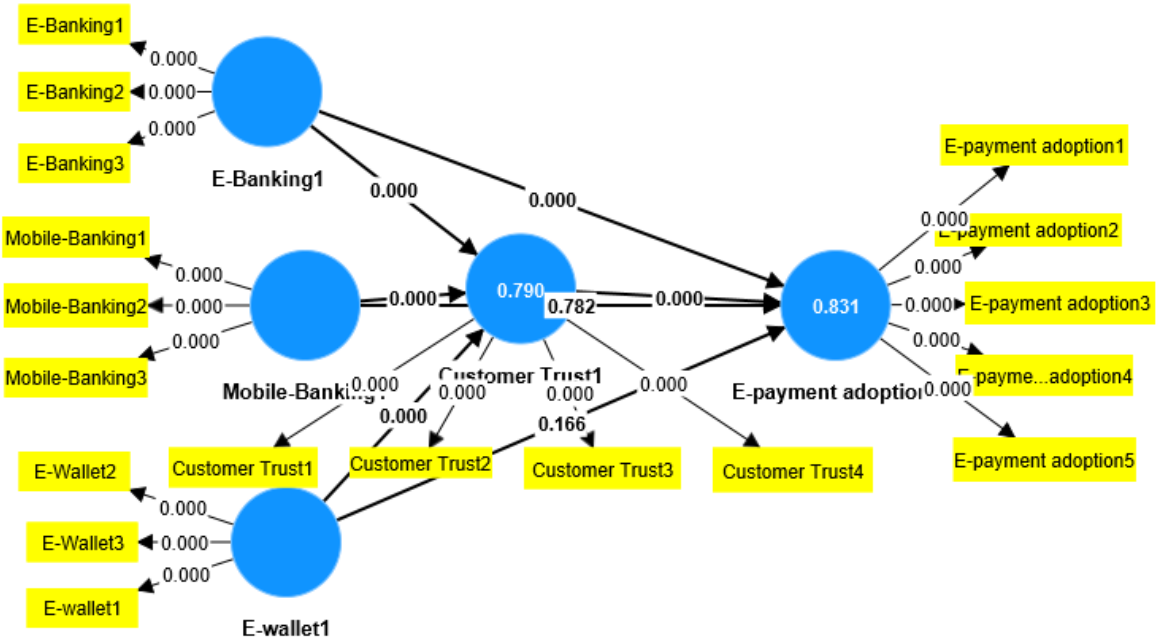

Figure 2. Shows *t*-values of all items and construct.

The preceding PLS-SEM model in **Figure 2** demonstrates that whenever the *t*-values for the regression weights exceed the prescribed limit of 1.96, each path is significant at the 5% significance level or better (i.e., the estimated path parameter is significant). The results of the SEM model are presented in the following tables.

Table 12. Impact of mobile banking on customer trust and e-payment adoption.

Hypothesis	Path	*B*	*t*-value	*p*-value	Result
H01	Mobile banking → Customer trust	0.1983	2.774	$p < 0.001$	Supported
H02	Mobile banking → Customer trust → e-payment adoption	0.2292	2.834	$p < 0.001$	Supported

Table 12 shows that mobile banking directly and positively related to customer trust ($\beta = 0.1983$, *t*-value = 2.774 and $p < 0.001$). supported hypotheses H01 and H02. Similarly, customer trust has a mediating or indirect effect on e-payment adoption ($\beta = 0.2292$, *t*-value = 2.834 and $p < 0.001$).

Table 13. Impact of e-wallet on customer trust and e-payment adoption.

Hypothesis	Path	*B*	*t*-value	*p*-value	Result
H03	E-wallet → Customer trust	0.3625	5.222	$p < 0.001$	Supported
H04	E-wallet → Customer trust → e-payment adoption	0.4194	5.430	$p < 0.001$	Supported

Table 13 shows that e-wallet directly and positively related to customer trust ($\beta = 0.1983$, *t*-value = 2.774 and $p < 0.001$). supported hypotheses H01 and H02. Similarly, customer trust has a mediating or indirect effect on e-payment adoption ($\beta = 0.2292$, *t*-value = 2.834 and $p < 0.001$).

Table 14 shows that e-banking directly and positively related to customer trust ($\beta = 0.1983$, *t*-value = 2.774 and $p < 0.001$). supported hypotheses H01 and H02. Similarly, customer trust has a mediating or indirect effect on e-payment adoption ($\beta = 0.2292$, *t*-value = 2.834 and $p < 0.001$).

Table 14. Impact of e-banking on customer trust and e-payment adoption.

Hypothesis	Path	*B*	*t*-value	*p*-value	Result
H05	E-banking → Customer trust	0.2780	3.969	$p < 0.001$	Supported
H06	E-banking → Customer trust → e-payment adoption	0.3220	3.985	$p < 0.001$	Supported

Table 15. Impact of customer trust on e-payment adoption.

Hypothesis	Path	*B*	*t*-value	*p*-value	Result
H07	Customer trust → e-payment adoption	0.8641	**24.150**	$p < 0.001$	Supported

Table 15 shows that customer trust directly and positively related to e-payment adoption ($\beta = 0.1983$, t-value = 2.774 and $p < 0.001$).

5.3. Descriptive statistics

Descriptive statistics methods such as percentages and frequency were used in this study to test and explain respondent attributes.

Table 16 denotes the participants' demographic statistics based on their "gender, age group, educational qualification, occupational status, monthly income and Which bank you are using?" It shows that sample respondents (63.09%) were "Males (M)", whereas (36.90%) were "Females (F)". The following detail indicates that maximum of the respondents (30.95%) fit to the age group of 36 years above, 12.79% were up to age of 18 years, and 25.59% belonged of age group of 19–25 years and lasting 30.65% fall within the age group of 26–35 years.

Table 16. Baseline data of the participants ($N = 336$).

Basis	Categories	F	%
Gender	M	212	63.09
	F	124	36.90
	Total	336	100
Age group	Up to 18 years	43	12.79
	19–25 years	86	25.59
	26–35 years	103	30.65
	36 and above	104	30.95
	Total	336	100
Educational qualification	U.G	55	16.36
	G	76	22.61
	P.G	144	42.85
	P.D.H	61	18.15
	Total	336	100
Occupational status	Govt. sector	79	23.51
	Private. Sector	106	31.54
	Business and self. Employees	98	29.16
	Students	53	15.77
	Total	336	100

Table 16. (*Continued*).

Basis	Categories	F	%
Monthly Income	≤ Rs 15,000	35	10.41
	Rs 15,001–Rs 30,000	87	25.89
	Rs 30,001–Rs 40,000	92	27.38
	> Rs 40,000	122	36.30
	Total	336	100
Which bank you are using?	Private sector bank	107	31.84
	Public sector bank	89	26.48
	Both	140	41.66
	Total	336	100

"Educational qualification" indicates that 16.36% of respondents represent to Under Graduate (U.G), 22.61% belong "Graduation(G)", 42.85% belongs to Post Graduation (P.G), and 18.15% represent "Professional Degree Holder (PDH)". Occupational status represents that 23.51% of respondent represent to "Government sector", 31.54% belong to private employees, 29.16% belong to business or "self-employees", and 15.77% represent students.

The "monthly income" of the participants shows that 10.41% respondents represent to income of Rs ≤ 15,000, 25.89% respondents belong to income of Rs 15,001–30,000, 27.38% respondents belong to income of Rs 30,001–40,000 and 36.30% respondents belong to income of Rs < 40,000. Consumer using 31.84% of private sector bank, 26.48% of public sector bank and 41.66% using both banks.

- Similarities

Prior research has thoroughly examined the aspects that impact user adoption, including perceived ease of use, perceived usefulness, trust, and social influence. The Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) are often used frameworks. Prior studies also emphasise the crucial significance of security and privacy. Research frequently investigates consumers' apprehensions regarding data protection, methods of authentication, and the consequences of security breaches on confidence and acceptance. The research on both e-banking and mobile banking often investigates the influence of service quality on customer satisfaction, loyalty, and retention. Service quality dimensions are frequently assessed using models such as SERVQUAL. Research in these domains investigates the impact of digital banking technology on banking performance, operational efficiency, cost reduction, and profitability. Prior research in both fields examines the regulatory obstacles, adherence to banking regulations, and the impact of government policies on promoting secure and dependable digital banking environments.

- Differences

Prior studies frequently concentrated on the technology landscape encompassing personal computers and internet connectivity. Topics such as broadband speed, website design, and desktop security protocols were frequently examined. Current research is mostly centred around mobile-specific technology, including mobile network connectivity, app usability, mobile-specific security

measures (such as SMS-based authentication), and the incorporation of smartphone features like GPS and biometrics

Historically, research has focused on the user experience pertaining to website interfaces, navigation, and the difficulties encountered when utilising e-banking services on larger displays. Prior studies frequently focused on advancements in internet banking, such as the implementation of online bill payments, online fund transfers, and web-based customer assistance. Recent studies focus on investigating advanced technologies such as mobile wallets, NFC payments, mobile-based financial services, and the incorporation of artificial intelligence and machine learning in mobile banking applications.

6. Discussion

The use of mobile banking and the replacement of traditional platforms with these new technologies is highly relevant in the IT community (Z. Liu et al., 2022). Mobile banking is a broad term that refers to a vast pool of virtualized resources. In order to promote secure and transparent access to a wide range of platforms and non-homogenous databases, cloud databases are provided to users. Sub-indicators for resource digitization, "ease of use," and "cost flexibility" are included in the mobile banking variables (Naseri and Jafari Navimipour, 2019). Mobile banking directly and positively related to customer trust ($\beta = 0.1983$, t-value = 2.774 and $p < 0.001$).

If banks had secured electronic banking systems in place, they could safeguard their customers' financial and personal information, particularly when conducting e-banking transactions. Additionally, they can use this method to increase CS (Tsai et al., 2014). E-banking directly and positively related to customer trust ($\beta = 0.1983$, t-value = 2.774 and $p < 0.001$).

Despite this, technology alone is not sufficient for knowledge transmission, as people play a critical role in creating and disseminating information. E-wallet can be used in a variety of ways, in different industries, and by a variety of people (Sundaresan and Zhang, 2016). It's also a way for people to learn new things and get better at what they do. E-wallet directly and positively related to customer trust ($\beta = 0.1983$, t-value = 2.774 and $p < 0.001$).

There has been a lot of evidence to show that e-payment adoption and customer trust are directly linked. For e-banking to be a success and to have happy customers, the quality of the system's service is critical. The best servers are those that can deliver data quickly and reliably (Parasuraman and Grewal, 2000). Customer trust directly and positively related to e-banking adoption ($\beta = 0.1983$, t-value = 2.774 and $p < 0.001$).

7. Conclusion and implication

There are a lot of changes taking place in the service industry today. People who work for service companies have changed how they do their jobs because of new technology. This study's aim is to discover variables that influence trust when using e-payment services. Following a literature review, a theoretical foundation and a questionnaire were created. The questionnaire was distributed to bank customers. Following that, the questionnaire's validity and reliability were established. All of

the study's hypotheses were found to be true by the results of the analysis. Seven hypotheses were tested in this study to determine the e-payment adoption of e-banking, mobile banking, and e-wallet systems depending on the survey. According to the findings, e-banking, mobile banking, and e-wallet are critical in customer trust. Indicators such as "resource virtualization, ease of use, and cost flexibility" were identified in the e-banking dimension. Banks can use e-banking computing as a platform for developing their own services. Security assessments and the amount of money invested in internet banking via public cloud IaaS are included in the internet banking sections. Certain mobile banking sectors with rigorous security requirements and substantial investment capacity can benefit from private cloud IaaS. Others may choose from among these modes of execution. A suitable application for blended learning (such as a forum and chat) is thus presented, along with the option of accrediting users. It's also possible that you could talk to another subscriber in real time.

- Main findings

The majority of individuals in the age range of 18–30 years utilise online banking services. A lesser proportion of women utilised internet banking services. Due to their lack of knowledge regarding the utilisation of financial services. Additionally, it discovered that men have predominantly retained control over financial decision-making. There has been a lot of evidence to show that e-payment adoption and customer trust are directly linked. For e-banking to be a success and to have happy customers, the quality of the system's service is critical. Online banking services offer cost reduction for transactions, time-saving benefits, user-friendly interfaces, and the convenience of access from any location. These feathers have a beneficial effect on individuals who utilise online banking services. If banks had secured electronic banking systems in place, they could safeguard their customers' financial and personal information, particularly when conducting e-banking transactions. Additionally, they can use this method to increase customer satisfaction. E-banking directly and positively related to customer trust.

7.1. Theoretical contributions

Mobile banking, e-banking, and e-wallet service quality is linked to increased e-payment adoption and, as a result, a reduction in costs, which leads to an increase in revenue. Overhead costs such as marketing, staffing, and so on are gradually decreasing as a result of the growing acceptance of the e-banking as an immediate delivery channel. E-payment adoption and desire to use e-banking have acted as moderators in the quality of information, service, system and customer trust. Customers e-payment adoption is positively influenced by the quality of electronic services. Customers' trust is also influenced by the company's comparative advantage. If banks had secured electronic payment systems in place, they could safeguard their customers' financial and personal information, particularly when conducting internet banking transactions. Additionally, they can use this method to increase customer trust. The terms "privacy," "integrity," and "digital signature" refer to sub-indicators of the security variables associated with electronic payment systems. One of the most significant contributions of the modern banking system has

been to make monetary and banking services more widely available to individuals and groups around the world. There is a plethora of advantages to using mobile banking, e-banking, and e-wallets. These include, but are not limited to, the following: the removal of the need to physically visit bank offices; improved accuracy of payments and receipts; faster processing of economic transactions; enhanced security; and many more.

7.2. Practical implications

This research model provides a comprehensive understanding of the different factors that influence the behaviour of Saudi Arabian consumers towards e-payment. It also offers several implications for practitioners. For example, the study shows that the perceived usefulness of e-banking, m-payment, and e-wallet has a significant impact on consumers' attitudes and use behaviour. Therefore, when targeting Saudi consumers, advertising messages should emphasise the practical benefits of these electronic payment methods. These interactions also suggest that enterprises should implement a robust and dependable electronic payment system that can fulfil the expectations of consumers, especially those who are technology aficionados. The developers should create mobile applications that are easy for users to navigate and understand, as well as electronic payment apps, in order to increase consumers' confidence in utilising them for making payments on any device connected to the Internet.

The notable impact of trust on attitude suggests that mobile apps and e-commerce organisations need to enhance trust by explicitly showcasing return and privacy policies or by procuring visual representations of security and quality certifications. It is important to prioritise trust-building operations, particularly in regards to emerging forms of electronic payment such as e-banking, m-payments, NFC, and e-proximity. These efforts will contribute to a decrease in consumer concerns about potential risks. It is imperative for them to swiftly address consumer inquiries regarding failed e-payment transactions and promptly exhibit transparency when resolving claims related to these failed transactions. Any legal concerns about e-payment must be promptly settled by the e-payment service providers.

Privacy indicators, integrity, and digital signatures are all components of the e-payment system. We also need to find out how many people are currently using online banking. I think it could have a big impact on the bank's end result; what they should focus on in order to make online banking safer. It is also important to note that e-payment users of mobile banking, e-banking and e-wallet contributes significantly to the field. Indicators include system availability, flexibility in time and space, and user skills. The data analysis also revealed that e-payment adoption is heavily influenced by customer trust, which includes "cost effectiveness, user friendliness, and technical support,", all of which fall under the umbrella of service quality. When customers receive high-customer trust, they see it as a good investment and are willing to pay a premium for it. In addition, e-payment adoption uses customer trust as a strategic tool to improve customer satisfaction.

7.3. Recommendation

The bank should encourage individuals between the ages of 31 and 50 to utilize internet banking services for their financial needs. It is necessary to implement new policies and incentives to encourage online banking users to engage in a higher volume of transactions. In order to cater to female customers, the bank must implement measures to facilitate the utilisation of online banking services. It is necessary to offer additional amenities such as training programmers and awareness camps to cater to various client demographics. It is advisable for the bank to establish partnerships with other financial institutions in order to facilitate online collection of bill payments and other financial transactions. The bank should enhance the quality of its online banking service by improving the website design, home page of the bank's website, and server availability.

8. Limitations of study

The first problem is that most of the people who took the survey came from an urban area, which may not have the same e-banking, mobile banking, e-wallet situation as rural areas. As a result, the study can't be generalised because it only looks at e-banking in cities. Second, convenience sampling was used as a non-probability sampling method, which means the findings aren't very likely to be accurate for other participants. Third, we only talked about one mediator variable, which was customer trust, while other settings could be important. Any other factor could be used to change how mobile banking, e-wallet, and e-banking are used by Saudi Arabian banks.

9. Future suggestions

Firstly, this research used a non-probability based convenient sampling method to collect the data from a few cities and via personally visiting places or online form which mainly included banks, shopping place and universities for examining factors affecting mobile payment adoption in Saudi Arabia**.** Non-probability sampling should not have made a substantial impact on the results of this study. However, it would be useful for future studies to employ probability sampling so a comparison can be made with studies that have employed non-probability sampling.

The questionnaire was in English language only. Saudi Arabia is a country of multiple languages and cultures and collecting data only in one language restricts participants of other culture and languages. In future, data can be collected by a method which allows people from different language and education level to participate**.**

Third, this research selected responses from only adopters of mobile payment technology in Saudi Arabia. There is a need to perform research on non-adopters and analyse results using the model proposed in this research. Fourth, this research focused only on a qualitative approach which restricted the in-depth view of consumers to explore more on payment adoption. Due to time and resources constraints in depth research using a mixed method approach could not be conducted. Future studies can utilise a mixed method approach for further understanding.

Author contributions: Conceptualization, AH and MAK; methodology, SMM; software, MK and SA; validation, AH, MK and SH; formal analysis, MAK; investigation, MK and SH; resources, SH; data curation, SMM; writing—original draft preparation, MAK and SMM; writing—review and editing, AH and SH; visualization, MK; supervision, MAK; project administration, MK and SH. All authors have read and agreed to the published version of the manuscript.

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