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## Exploring intention and actual use in digital payments: A systematic review and roadmap for future research

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### 1. Introduction

In 2020, 2.4 billion people used digital banking worldwide, and that number is expected to grow to 3.6 billion in the next four years (Jadil et al., 2021). The accelerated growth of digital banking globally is driven by the expansion of mobile phone use and the tremendous growth of the Internet. The Internet is one of the technologies that people, organizations, and countries can use to accelerate their development and wealth (Isaac et al., 2019). There are currently 5.16 billion internet consumers worldwide, representing 64.4% of the world's total population. In the past year, the number of global internet users increased by 1.9% (Data-reportal, 2023). This is evident from the datareportal in 2023, where the number of individuals using the Internet has increased rapidly.

The Internet has evolved into a conduit for financial system-related technology developments, including payment systems. The dynamic payments sector is known for its innovation and speed. The industry is focusing on building resilient and robust infrastructure during the COVID-19 pandemic. As the global economy slows down, banks must evolve and expand economically. In the post-pandemic era, digital technology has become increasingly popular among both customers and businesses, leading to a surge in cashless payment options. This trend is primarily driven by the growing preference for convenience, particularly among consumers. Due to the recession, global non-cash transaction growth is expected to slow between 2022 and 2026. The IMF expects all major economies to slow down in 2023. The volume of non-cash transactions will grow slowly due to rising inflation and geopolitical risks. Despite the slowdown, comparative data shows that new payment methods (instant payments, electronic money, mobile and digital wallets, account-to-account, and QR codes) are gaining popularity. In 2021, cards, credit transfers, and direct debits accounted for 83% of cashless transaction volume, while new payment methods

accounted for 17%. New payment methods will account for 28% of volume by 2026 while existing payment methods (traditional payments) will drop to 72% of non-cash transactions (Capgemini, 2022). QR code payments, tap-and-go (NFC), digital wallets, and account-to-account payments have become popular due to the use of mobile payments (Capgemini, 2022).

The emergence of new innovations in the financial sector periodically shifts the role of cash as a means of payment into the form of cashless payments (Alkhowaiter, 2022). Digital payments give users several advantages, including one-click payments, no need to carry cash, ease of tracking small transactions, discounts and cashback programs, and, most importantly, security. In this regard, digital payments are a successful innovation in several developed countries because they are considered an important component of those that will save time, effort, and money (Alkhowaiter, 2022).

Globally, digital payment technology has grown rapidly, and its vast power and international influence are expanding. Digital payments are online resources and payment techniques used to exchange value over the Internet. Digital payments include credit cards, e-cash, internet banking, mobile banking, QR code payment, and e-check (Effah, 2016; Yaokumah et al., 2017). In terms of payment, Consumers can use their smartphones to make in-store purchases. One's bank account can be linked to a digital payment app, and vouchers can be sent wirelessly to the seller's terminal via NFC. In 2022, mobile technology and services accounted for 5% of global GDP, with an economic value added of \$5.2 trillion (GSMA, 2022). Wang et al., 2017 reported that cross-border digital payments play an important role in promoting international trade, pointing out that systemized digital payment services will drive the integration of digital payments and settlements in the Asia-Pacific region and have even contributed to the constant diversification and growth of buyer markets in Southeast Asia.

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Digital payment systems facilitate business transactions and allow users to pay for products and services through these payment channels whenever and wherever they choose. Given its prominent benefits, these benefits cannot be fully realized if users do not use them. To achieve the expected level of success in implementing digital payments, it is important to persuade individuals to carry out daily payment activities through digital payments contrasted with conventional payment, like utilizing cash (Jadil et al., 2021). Therefore, it is very important for decision-makers such as governments, banks, and applicators to identify and understand the influential factors that will substantially contribute to the use of digital payments by individuals/customers (Giovanis et al., 2019)

Recent literature reviews and factors identified by previous researchers may help in the design of more effective models for increasing digital payment acceptance. Despite the fact that payments have been extensively researched over the past decades, there is still a dearth of comprehensive reviews (Kajol et al., 2022). Blut et al. (2022) demonstrate that a written effective article of review not only offers readers an up-to-date grasp of the study issue but also aids in the identification of research gaps and future research directions.

The emphasis on contemporary literature captures the expanding frontiers of the research domain. Increased Internet and mobile phone usage influence the use of technology for digital payments. Therefore, researchers have focused on digital payments during this period. Concentrating on current research will document the most recent knowledge and findings in the field and provide a summary of current research findings (Kajol et al., 2022). This paper seeks to provide a summary of findings from previous digital payment studies so as to identify potential future research topics and implications. According to Dahlberg et al. (2008), digital payment service providers and researchers can use. Reviewing the current research elucidates the current status of research in the field and identifies its future directions.

A review of past articles prevents researchers from duplicating efforts and exposing significant gaps in the discipline (Sahi et al., 2021). In other terms: Identifies areas where there is already an abundance of research while disclosing new information.

Previous research has identified the potential for expanding the use of digital payments. Due to the accelerated growth of m-banking and payment systems, numerous studies have been published on digital payments. Previous research on technology acceptability and utilization revealed mixed results. The existing systematic review literature is quite scattered; for instance, a few investigations are confined to explicit geological areas (Alkhowaiter, 2020), while others are restricted to certain digital payment tools (Hanafizadeh et al., 2014; Kajol et al., 2022; Suryono et al., 2020), and certain factors (Karsen et al., 2019; Tam & Oliveira, 2017; Tamilmani et al., 2019).

On the other hand, Sahi et al. (2021) and Kajol et al. (2022) have conducted systematic literature reviews on electronic payments in prior research. This study differs from previous research by employing a distinct and more detailed methodology. Therefore, the purpose of this paper is to provide a summary of the findings of studies on the factors that influence the intention and actual use of digital payments and to identify future research opportunities. We will implement this strategy by employing the Prisma method, incorporating the keyword QRcode payment (since, according to Capgemini, 2022, QRcode is one of the newest digital payment methods), restricting the database to the last ten years, applying clearer inclusion and exclusion criteria, and concentrating on Q1 and Q2 quality journals.

We identified research gaps in order to assist future researchers. Consequently, the findings of this study will aid as the basis for coming exploration and provide new research areas. The uniqueness of this study with previous studies are this study utilizing the Prisma method, utilizing QRcode keywords, limiting the database to the last 10 years with the specified time range from 2013 to 2023, implementing clearer inclusion and exclusion criteria, and concentrating on Q1 and Q2 quality journals. The authors outline the theories employed, information,

constructions, and methodology in the form of tables and figures, following a structured literature review method.

By uncovering new theories, constructs, and possible methods that have yet to be explored, Future study avenues suggested provide a better grasp of what to accomplish. A further contribution of the current literature review is the identification of research-deficient areas. Additional contributions to the existing literature review.

The authors nevertheless respond to the following research question (RQ):

What were the theories used in the previous research?

What were the methodologies used in previous studies?

What factors influence digital payment usage intentions and actual usage?

What is the future direction of research?

This study contributes to the existing body of knowledge by providing a comprehensive analysis of recent studies on digital payments. It also provides an overview of the factors that influence digital payment usage intentions and actual usage, as well as interesting directions for future research, and contributes to the development of consumer behavior research theory, thereby assisting researchers in identifying potential research opportunities and the most important research topics in the current literature.

The article continues as follows: Section 2 presents the methodology and research strategy used in this study. Section 3 introduces the SLR's findings. The fourth section discusses the identified research gaps and prospective research avenues. The investigation concludes in Section 5.

## 2. Materials and methods

It is no longer possible to see research on digital payments as an integrated field of study, as its scope has expanded significantly. This research includes research that explains the factors that influence the intention and actual usage of digital payments.

### 2.1. Method of investigation

The authors did a comprehensive literature review to assess the most recent digital payment literature (Page et al., 2021). A systematic literature review was carried out for a number of reasons, including locating, assessing, evaluating, and interpreting all current research with relevant research questions in the area of interest (Fariysi et al., 2022). Another key characteristic of SRL is that it resolves questions that could be deceptive if one study is studied separately (Kajol et al., 2022)

### 2.2. A systematic review and database search

The systematic review adhered to the 'Preferred Reporting Items for Systematic Reviews and Meta-Analyses' (PRISMA) criteria, including using keywords to search the database for relevant publications. Although the original intent of the revised method was to increase transparency in clinical research, it is now also employed in systematic literature reviews in other fields (Fariysi et al., 2022; Kajol et al., 2022). Kajol et al. (2022) conducted a systematic literature review using PRISMA to combine previous literature on digital financial transactions (DFT), identify factors that influence DFT adoption, and identify research deficits in this field. The focus of the assessment is empirical studies published between 2009 and 2020. The research identifies fifteen motivating factors and five impediments to DFT adoption. Literature indicates that perceived usefulness, perceived simplicity of use, compatibility, trust, security, effort expectation, performance expectation, and facilitating conditions are the most influential factors on DFT adoption. Cost of use, perceived risk, complexity, resistance to change, and privacy concerns were identified as the primary obstacles to DFT adoption in this study. While the Fariysi et al. (2022) study seeks to investigate the development of sustainability

reporting from both a theoretical and practical standpoint, as well as how solutions are addressed, it is also concerned with the evolution of sustainability reporting. In this investigation, a systematic approach to the literature was taken. Using the PRISMA method, 24 articles meeting the criteria were identified. Current research on sustainability reporting concentrates on nine variables, including company size, profitability, financial leverage, corporate governance structure, ownership structure, company age, industry sector, company attitude, and board qualifications and experience.

A key characteristic of PRISMA is its ability to provide a transparent and well-structured reporting framework, without going into great detail about the review process. The PRISMA selection procedure consists of four steps: (1) identification of relevant research through a brief database search, (2) abstract screening, (3) full-text evaluation, and (4) determination of eligibility.

### 2.2.1. Identification of relevant research through a brief database search

This research uses the Scopus and Web of Science databases. Both are well-established citation databases for literature in the social sciences that have been peer-reviewed. A database accessible online ensures the highest standards and transparency and facilitates global searches. This study used electronic searches in relevant databases such as Scopus and WoS, according to Jadir et al. (2021). The research of Jadir et al. (2021) conducted a meta-analysis to resolve contradictory results in the literature on mobile banking (m-banking) adoption. For the meta-analysis, data from Scopus and WOS were used. The purpose of this study is to elucidate and synthesize empirical findings from m-banking studies published since 2004 with an emphasis on UTAUT theory. This meta-analysis confirms all direct relationships within the UTAUT model. The expectation of performance emerged as the most influential determinant of usage intent. Journals indexed by Scopus and WoS are internationally recognized and regarded as high quality (InternationalJournalLabs.com, 2022).

Consequently, this decision enabled us to cover a large number of existing publications on pertinent subjects. The following keyword combination was used to search each database: "Digital Payment" OR "E-Payment" OR "Electronic Payment" OR "Mobile Payment" OR "M-Payment" OR "Mobile wallets" OR "E-wallet" OR "M-Banking" OR "Mobile Banking" OR "E-Banking" OR "E-money" OR "Electronic money" OR "Electronic Banking" OR "Virtual Payment" OR "QR Code Payment" AND "Adoption" OR "Acceptance" OR "Diffusion" OR "Usage" OR "Intention" OR "behavior Intention" OR "behaviour Intention" OR "Use Behavior" OR "Use Behaviour." This review includes only peer-reviewed journal articles published between 2013 and 2023 that are final, in a journal (not preprint), and written in English. By restricting the search to the previous ten years, the study ensured that the consulted sources were the most pertinent and current. New discoveries and improved comprehension frequently appear in the most recent journals, as research fields are constantly evolving. Focusing on the most recent literature can reveal the most current comprehension. A preliminary database search identified 1749 Scopus records and 3679 WOS records. After removing duplicates, 4449 articles remained for further review. The following information about the article was compiled on a datasheet: title, author, name, publication year, and abstract. The next round, screening by abstracts, was conducted for these articles.

### 2.2.2. Abstract screening

According to the research queries posed and inclusion criteria. Criteria for inclusion in this investigation Studies that elucidate or analyze the factors that influence the selection of digital payment methods. Studies involving digital payment user populations or individuals. 3. Design of quantitative research. 4. Year of publication 2013–2023 5. Documents employing English 6. Articles published in Scopus-indexed Q1 and Q2 journals. 7. The PDF file for the article is complete and can be downloaded. 8. There are statistical data regarding the P and t values.

While the exclusion criteria must include: 1. Studies that are unrelated to digital payments or factors that influence the determination of digital payments (e.g., cryptocurrencies, bitcoin); and 2. Studies that have not yet been published. Studies involving populations irrelevant to digital payments, such as those focusing on corporeal transactions or non-digital payments. 3. Qualitative review of proceedings 4. Publications outside of the 2013–2023 range. 5. Use a language other than English. 6. Articles are not indexed or covered in Q1 or Q2 journals. PDF documents are inaccessible. There are no statistical data regarding the p and t values. Consequently, at the stage of abstract screening, data that did not meet the criteria were eliminated. Following the inspection of abstracts, 542 articles were selected for full-text analysis.

### 2.2.3. Full-text evaluation

Articles that have met the inclusion criteria in the abstract selection then need to be further evaluated by reading the full text. This involves a deeper examination of the content and methodology of each selected article. Inclusion criteria are also applied to the full-text examination. Excluded articles usually do not have p and t values, only display moderating effects without the direct influence of independent and dependent variables, and only test for mean differences. For the listed reasons, 413 articles were excluded from the qualitative research, while 129 were included.

### 2.2.4. Determination of eligibility

A thorough process of exclusion and inclusion yields one hundred thirty-eight most relevant articles for research. Fig. 1 depicts the literature review process used by the PRISMA model. In this investigation, a literature review within studies and a literature review between studies are conducted. The entire article is analyzed in analysis in studies, whereas two or more studies are compared in analysis between studies.

This highlights the similarities and variances between studies. A structure-based analysis strategy was used to review the literature. Through figures and tables, the author provides detailed information regarding techniques, concepts, and variables in structured approaches (Kajol et al., 2022). In the following sections, the author presents the most frequently cited previous research, the geographic location of published research, digital payment acceptance factors, and profiles of previous research.

This study determined the ten most important studies (refer to Table 1) based on the study of citations. According to previous research (Kajol et al., 2022), citation analysis identifies the most popular articles and those that contribute the most to their respective field. The total number of citations determines the classification of Table 1. The average citation score is computed by dividing the total number of citations by the years since the study's publication (excluding the publication year). Oliveira et al., 2014, Slade et al., 2015, and Koenig-Lewis et al., 2015 are the top three studies, according to the evaluation procedure. According to the authors, these studies may be a foundation for future research.

## 2.3. The geographic location of previous investigations

According to the study's geographical location analysis, Pakistan, India, and China are the most researched nations. Pakistan has fourteen articles, India fourteen, and China twelve. In terms of occurrence, the authors discovered that the majority of lessons were shown in Asian nations. The most feasible explanation for these findings is the recent push to adopt digital payment methods in these nations. A thorough analysis of Fig. 2 confirms that, after Asia, Africa (n = 15) is the most researched geographical region.

### 2.3.1. Factors of digital payment acceptance

The study examines various influencing factors for digital payment acceptance. The identified factors are classified into two things, namely, intention and actual usage. Table 2 identifies the variables based on a comprehensive analysis of the relevant literature, with a concentration

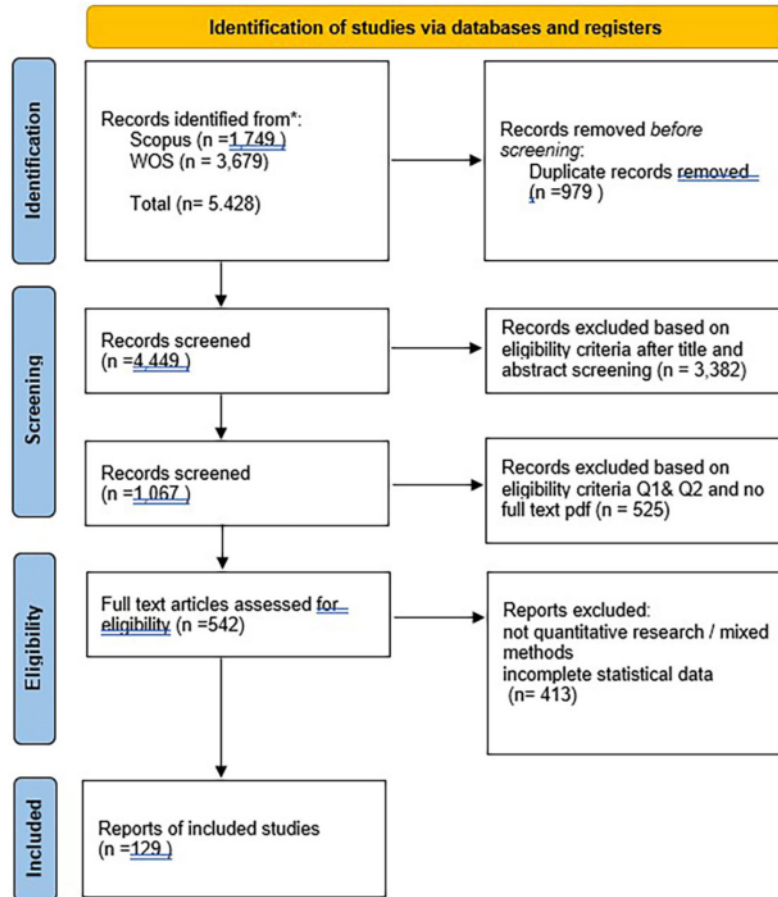


Fig. 1. Prisma.

**Table 1**  
The classification of determined by the whole amount of citations.

Author	Total citations	Citation per year
Veira et al. (2014)	935	102.67
Slade et al. (2015)	930	114
Koenig-Lewis et al. (2015)	406	50
de Luna et al. (2019)	400	78.2
ugh et al. (2020)	397	78.4
Chawla and Joshi (2019)	371	73.8
Teoh et al. (2013)	364	32.91
Kwateng et al. (2019)	294	48.5
Al-Saedi et al. (2020)	280	70
Rahi, Othman Mansour, et al. (2019)	263	46.8

Source: compiled by the authors

on those variables that have been studied most frequently. Specifically, the study selected variables that have been cited in at least ten different articles, indicating that these variables have a substantial impact on research intentions in a variety of contexts.

Meanwhile, based on the results of the literature review, Table 3 of this study outlines the independent variables involved in comprehending actual use. This study contains characteristics that are commonly examined in relation to actual use and have been mentioned in the relevant literature by at least five separate researchers.

#### 2.4. Study profile

This study used the data presented in each article to categorize the articles by theory. This study identified, and documented the name of each hypothesis mentioned or referenced in an article about digital payment intention and actual usage. 59 out of 129 investigations were based on different theories or their extensions. Fig. 3 illustrates the theories and models used in the studies reviewed. Fred Davis introduced the 'Technology Acceptance Model' (TAM) in 1989, which has served as an important foundation for analyzing digital payments. TAM has been used efficiently in most studies. 'Unified Technology Acceptance and Use of Technology' (UTAUT) was identified as the second most widely used theory in investigations.

#### 2.5. Methodology summary

Meanwhile, in terms of methodology, this study classifies articles based on the approach used for data analysis related to examining factors that influence the intention and actual usage of digital payments. Fig. 4 depicts the methods utilized in the evaluated study. The authors noted the study's use of PLs, regression, and SEM. It is important to note that PLS-SEM will be the most widely used method from 2013 to 2023 regarding data acquisition techniques and sample sizes. Fig. 5 describes the sample size chosen in the past research.

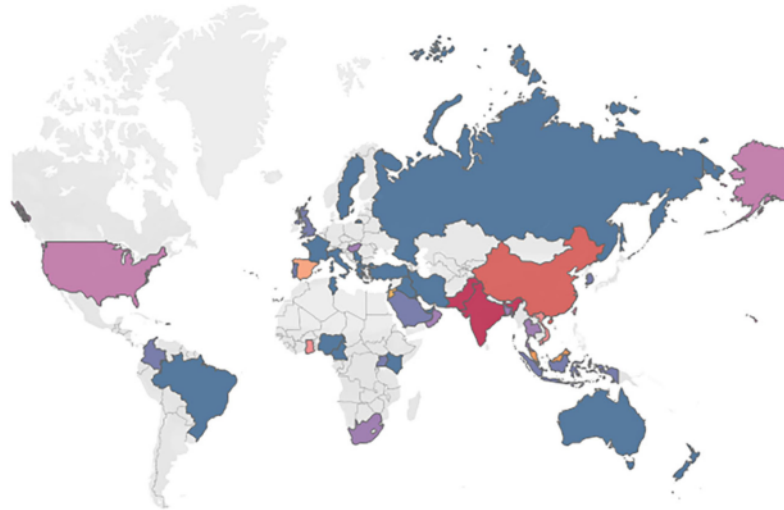


Fig. 2. Geographical region.

Fig. 5 show the information sample sizes utilized in earlier investigations. Nine research were shown to have used material from more than one nation (Akhtar et al., 2019; Flavian et al., 2020; Ho et al., 2020; Khanra et al., 2021; W.R. Lin et al., 2020; X. Lin et al., 2019, 2022; Merhi et al., 2020; Migliore et al., 2022) This evaluation indicates that online data collection is growing in popularity.

### 3. Results

#### 3.1. Geographical area

From the data results of 129 articles based on their geographic distribution, it is known that nine articles conduct assessments with comparisons between countries, whereas the remaining articles only use one country. Despite the diversity of factors that influence the use of digital payments in a country, few cross-national studies have been conducted.

Based on the survey, the majority of the material originates from developing countries such as Pakistan, India, and China. In recent years, the number of internet users in developing nations has increased. In recent years, governments in a number of nations have adopted a number of initiatives to promote the individual. To establish digital transactions. This is among the numerous reasons. This region is of scientific interest.

Fig. 2 indicates that Pakistan is the most researched geographical region. This can be attributed to the Pakistan Telecommunication Policy 2015, which focused on achieving an all-encompassing national agenda and transforming Pakistan into a dynamic, knowledge-based middle-income country by 2025 (Hassan et al., 2018). By using Internet banking, transactions provide access to bank accounts 24 hours a day, seven days a week. To consumers, enabling them to conduct banking transactions online from their homes, such as bill payments, online shopping, fund transfers, etc. With a high level of technology diffusion, Pakistan is transforming into an information society and knowledge-based economy.

With 14 articles, India is the second most researched country. China follows with 13 articles, followed by Malaysia with 9 articles. Less than nine articles were dedicated to the study of other countries. One of the limitations of some research articles is the intentional use of non-probabilistic sample sizes and the absence of regional stratification across all geographic regions of a country's samples. Given that culture can vary significantly across regions, even within a country's borders,

this may be significant, particularly for countries with continental dimensions.

Adding cultural values to literature improves the description and measurement of cultural differences between nations. As in Akhtar et al. (2019) research that employs Hofstede's cultural dimensions definitions theory. The results indicate that culture influences the process of technology acceptance and that cultural differences between countries can influence how individuals employ technology. A further limitation is the absence of consideration for the sixth cultural dimension, indulgence (Hofstede, 2001), which was not addressed in this study due to the dearth of extensive material on the subject in scientific archives.

#### 3.2. Theories applied in previous articles

As shown in Fig. 3, the Technology acceptance model (TAM), with 57 articles is the most extensively used theory. Fifty articles then investigated the Unified Theory of Acceptance and Use of Technology (UTAUT). Here, the UTAUT theory includes UTAUT2. Nine articles lacked explicit references for their theoretical foundation. Up to ten articles utilized the theory of Diffusion of Innovation (DOI) in their research. For other hypotheses, fewer than ten articles were studied.

Five articles employed four theories concurrently in their investigation. In their article, Baganzi and Lau (2017) utilized the diffusion of innovation model, UTAUT, TAM, and Theory of Planned Behavior (TPB) theories.

##### 3.2.1. TAM

TAM is a framework used in behavioral and management sciences to comprehend and analyze how individuals accept and adopt technology. Fred Davis created the model, and it has undergone several modifications and expansions since then. TAM seeks to elucidate the factors that affect user acceptance of technology. TAM is the most widely used study for technology adoption.

The model is relatively simple and straightforward to understand, so it can be quickly used to analyze technology acceptance. This makes it applicable in a variety of situations. TAM focuses on user perceptions and perspectives of technology, such as perceived ease of use and usefulness. In some situations, the simplicity of the TAM model may not be adequate to account for complex contextual factors. Consequently, TAM is frequently combined with other models and theories to provide a more comprehensive understanding of technology acceptance.

**Table 2**

Displays the determined influences on the intention to accept digital payments.

Code	Factor	Definition	Quotation (significant)	Quotation (non-significant)	Citation counts
ATT	Attitude	The extent to which an individual evaluates or judges a behavior as good or bad. Or attitude is a mental or nervous state of alertness that has developed through experience and has a direct or dynamic influence on an individual's attitude towards e-money and its issues (Fishbein & Ajzen, 1975)	(Ahmad et al., 2020; Ajina et al., 2023; Alam et al., 2021; Almaiah, Al-Rahmi, Alturise, Hassan, et al., 2022; Bailey et al., 2020; Ben Mansour, 2016; Carranza et al., 2021; Chang et al., 2021; Chawla & Joshi, 2019, 2020a, 2020b, Flavian et al., 2020; Giovanis et al., 2019; Ho et al., 2020; Kelly & Palaniappan, 2022; Kishore & Sequeira, 2016; Koenig-Lewis et al., 2015; Lu & Lu, 2020; Mehrad & Mohammadi, 2017; Nguyen & Nguyen, 2022; Park et al., 2019; Rahi et al., 2017; Singh et al., 2020; Siyal et al., 2019; Hassan et al., 2018; Zamil et al., 2022)	de Luna et al. (2019)	23
CMPA	Compatibility	The degree to which novel technology is determined to be compatible with the user's values, needs, and experience (Rogers & Everett, 1983)	(Agárdi & Alt, 2022; Chawla & Joshi, 2019, 2020a, 2020b; Chen et al., 2019; Hidayat-Ur-Rehman et al., 2022; Kapoor et al., 2015; W.R. Lin et al., 2020; Nawi et al., 2022; Phonthanukitithaworn et al., 2016)	Senali et al. (2022)	11
EE	Effort Expectancy	Described as the degree to which consumers believe new information technologies are simple to use (Venkatesh et al., 2003)	(Abikari et al., 2022; Abu-Taieh et al., 2022; Al-Saedi et al., 2020; Belousova & Chichkanov, 2015; Chen & Tsang, 2019; Kishore & Sequeira, 2016; Penney et al., 2021; Rahi, Abd.Ghani, et al., 2019; Rahi and Abd. Ghani, 2019b; Rahi and Abd Ghani, 2019a, Rahman et al., 2020; Yaseen & El Qirem, 2018; Zhang & Kang, 2019)	(Agyei et al., 2022; Al-Okaily, Alqudah, et al., 2022; Alqhtani et al., 2014; de Blanes Sebastián et al., 2023; Kaur & Arora, 2021; Kwateng et al., 2019; W.R. Lin et al., 2020; X. Lin et al., 2019; Ly et al., 2022; Malarvizhi et al., 2022; Malinga & Maiga, 2020; Merhi et al., 2020; Migliore et al., 2022; Oliveira et al., 2014; Sánchez-Torres et al., 2018; Slade et al., 2015; Yaseen et al., 2022)	31
FC	Facilitating conditions	The extent to which people are aware that they can use the technology because it is supported by resources (Venkatesh et al., 2003)	(Almaiah, Al-Rahmi, Alturise, Alrawad, et al., 2022; Chawla & Joshi, 2019, 2020a, 2020b, Chen & Tsang, 2019; Giovanis et al., 2019; W.R. Lin et al., 2020; X. Lin et al., 2019; Ly et al., 2022; Migliore et al., 2022; Nawi et al., 2022; Rahi, Abd.Ghani, et al., 2019; Rahi, Othman Mansour, et al., 2019; Rahman et al., 2020)	(Abu-Taieh et al., 2022; Al-Okaily, Alqudah, et al., 2022; Al-Okaily et al., 2020; de Blanes Sebastián et al., 2023; Kaur & Arora, 2021; Kwateng et al., 2019; Merhi et al., 2020; Penney et al., 2021)	22
HM	Hedonic Motivation	Described as the enjoyment or delight gained from utilizing a particular technology, play a significant influence in deciding technology adoption and use (Venkatesh et al., 2003)	(Agárdi & Alt, 2022; de Blanes Sebastián et al., 2023; Kaur & Arora, 2021; Koenig-Lewis et al., 2015; Lew et al., 2020; W.R. Lin et al., 2020; Ly et al., 2022; Malarvizhi et al., 2022; Merhi et al., 2020; Migliore et al., 2022; Kwateng et al., 2019; Penney et al., 2021; To & Trinh, 2021; Yaseen & El Qirem, 2018; Agyei et al., 2022)	(Agárdi & Alt, 2022; de Blanes Sebastián et al., 2023; Koenig-Lewis et al., 2015; Merhi et al., 2020; Migliore et al., 2022; Kwateng et al., 2019; Penney et al., 2021; Yaseen & El Qirem, 2018)	15
PE	Performance Expectancy	Degree to which an individual believes that by engaging in certain actions, he or she would reap some benefits as a result of utilizing a specific technology or innovation (Venkatesh et al., 2003)	(Abikari et al., 2022; Abu-Taieh et al., 2022; Agyei et al., 2022; Al-Okaily et al., 2020; Al-Okaily, Alqudah, et al., 2022; Al-Saedi et al., 2020; Almaiah, Al-Rahmi, Alturise, Alrawad, et al., 2022; Baganzhi & Lau, 2017; Chen & Tsang, 2019; Chen et al., 2019; de Blanes Sebastián et al., 2023; Hidayat-Ur-Rehman et al., 2022; Kapoor et al., 2015; Kaur & Arora, 2021; Kishore & Sequeira, 2016; Kwateng et al., 2019; W.R. Lin et al., 2020; X. Lin et al., 2019; Ly et al., 2022; Malarvizhi et al., 2022; Malinga & Maiga, 2020; Merhi et al., 2020; Migliore et al., 2022; Nawi et al., 2022; Oliveira et al., 2014; Penney et al., 2021; Rahi, Abd.Ghani, & Hafaz Ngah, 2019; Rahi, Othman Mansour, et al., 2019; Rahi and Abd. Ghani, 2019; Rahi and Abd Ghani, 2019a; Rahman et al., 2020; Salloum et al., 2019; Sánchez-Torres et al., 2018; Siyal et al., 2019; Slade et al., 2015; Yaseen et al., 2022; Yaseen & El Qirem, 2018)	(de Blanes Sebastián et al., 2023; Kwateng et al., 2019; W.R. Lin et al., 2020; Merhi et al., 2020; Narteh et al., 2017; Yaseen & El Qirem, 2018)	32
PEOU	Perceived ease of use	The perceived ease with which a mobile technology or service can be learned and used (Davis, 1989)	(Akhtar et al., 2019; Almajali et al., 2022; Belousova & Chichkanov, 2015; Chawla & Joshi, 2020a; Daragmeh et al., 2021; Giovanis et al., 2019; Hidayat-Ur-Rehman et al., 2022; Kalinic et al., 2020; Kelly & Palaniappan, 2022; Koenig-Lewis et al., 2015; Leong et al., 2020; Lew et al., 2020; Liu et al., 2019; Mortimer et al., 2015; Narteh et al., 2016)	(Almajali et al., 2022; Daragmeh et al., 2021; Kalinic et al., 2020; Koenig-Lewis et al., 2015; Phonthanukitithaworn et al., 2016)	21

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Table 2 (continued)

Code	Factor	Definition	Quotation (significant)	Quotation (non-significant)	Citation counts
PEVA	Perceived value	Described as a shopper's utility estimate of a product or service based on the advantages received and the cost of the service (Venkatesh et al., 2003)	2017; Nawi et al., 2022; Nguyen & Nguyen, 2022; Phonthanukitithaworn et al., 2016; Rabaa'i & Zhu, 2021; de Luna et al., 2019; Sarmah et al., 2020; Senali et al., 2022; Singh et al., 2020; Tavera-Mesias et al., 2022; To & Trinh, 2021; Zhang & Kang, 2019) (Al-Okaily et al., 2020; Almaiah, Al-Rahmi, Alturise, Alrawad, et al., 2022; Kaur & Arora, 2021; K.Y. Lin et al., 2020; W.R. Lin et al., 2020; Merhi et al., 2020; Migliore et al., 2022; Kwateng et al., 2019; Penney et al., 2021; Pham et al., 2019; Rahman et al., 2020)	(Al-Okaily, Alqudah, et al., 2022; de Blanes Sebastián et al., 2023)	13
PR	perceived risk	Users' perceptions of general uncertainty, as well as their anticipation of negative outcomes as a result of system use (Fu et al., 2006). Social risk, performance risk, financial risk, time risk, and security risk are all factors to consider. (Abu-Taieh et al., 2022)	(Abu-Taieh et al., 2022; Baganz & Lau, 2017; Chen & Tsang, 2019; Chen et al., 2019; Daragmeh et al., 2021; Giovanis et al., 2019; Kalinić et al., 2020; Kaur & Arora, 2021; Kishore & Sequeira, 2016; Koenig-Lewis et al., 2015; Liébana-Cabanillas et al., 2020; Liu et al., 2019; Mortimer et al., 2015; Pham et al., 2021; Penney et al., 2021; Pham et al., 2019; Rahman et al., 2022; Salloom et al., 2019; Singh et al., 2020; Slade et al., 2015; Tavera-Mesias et al., 2022)	(Agárdi & Alt, 2022; Al-Saedi et al., 2020; Almaiah, Al-Rahmi, Alturise, Alrawad, et al., 2022; Belousova & Chichkanov, 2015; Chung & Liang, 2021; de Blanes Sebastián et al., 2023; Kapoor et al., 2015; Malarvizhi et al., 2022; Migliore et al., 2022; Narteh et al., 2017; Phonthanukitithaworn et al., 2016; Wu et al., 2017)	33
PU	Perceived usefulness	Defined as the user's subjective likelihood of improving job performance by utilizing a specialized application framework (Davis, 1989)	(Agárdi & Alt, 2022; Ahmad et al., 2020; Akhtar et al., 2019; Alam et al., 2021; Almajali et al., 2020; Belousova & Chichkanov, 2015; Ben Mansour, 2016; Carranza et al., 2021; Chang et al., 2021; Chawla & Joshi, 2019, 2020a, 2020b; Daragmeh et al., 2021; Flavian et al., 2020; Giovanis et al., 2019; Jain & Agarwal, 2019; Jolly & Palaniappan, 2022; Koenig-Lewis et al., 2015; Leong et al., 2021; Lew et al., 2020; Liébana-Cabanillas et al., 2020; Liu et al., 2019; Mehrad & Mohammadi, 2017; Mortimer et al., 2015; Narteh et al., 2017; Nawi et al., 2022; Rabaa'i & Zhu, 2021; Senali et al., 2022; Singh et al., 2020; Siyal et al., 2019; Tavera-Mesias et al., 2022; To & Trinh, 2021; Wu et al., 2017; Zhang & Kang, 2019)	(de Luna et al., 2019; Kalinić et al., 2020; Liébana-Cabanillas et al., 2017; Phonthanukitithaworn et al., 2016; Sarmah et al., 2020)	39
SCR	Security	It is the degree to which a user perceives the transaction channel or platform as secure (Chawla & Joshi, 2018).	(Al-Okaily et al., 2020; Al-Okaily, Alqudah, et al., 2022; Chawla & Joshi, 2020b; Hidayat-Ur-Rehman et al., 2022; Kelly & Palaniappan, 2022; Liébana-Cabanillas et al., 2017; Merhi et al., 2020; Rabaa'i & Zhu, 2021; Rahman et al., 2022; de Luna et al., 2019; Zhang & Kang, 2019)	(Chawla & Joshi, 2019, 2020b; de Blanes Sebastián et al., 2023; de Luna et al., 2019; Liébana-Cabanillas et al., 2017; Malinga & Maiga, 2020; Nguyen et al., 2021)	16
SI	social influence	The extent to which a person believes that influential others believe they would use the application (Venkatesh et al., 2003)	(Abu-Taieh et al., 2022; Akhtar et al., 2019; Al-Okaily et al., 2020; Al-Saedi et al., 2020; Chen & Tsang, 2019; de Blanes Sebastián et al., 2023; Kapoor et al., 2015; Kaur & Arora, 2021; Kishore & Sequeira, 2016; Koenig-Lewis et al., 2015; W.R. Lin et al., 2020; X. Lin et al., 2019; Lu & Lu, 2020; Malarvizhi et al., 2022; Malinga & Maiga, 2020; Narteh et al., 2017; Penney et al., 2021; Rahi, Abd.Ghaffar et al., 2019; Rahi, Othman Mansour, et al., 2019; Rahman et al., 2020; Slade et al., 2015; Yaseen & El Qirem, 2018)	(Abikari et al., 2022; Agyei et al., 2022b; Chen et al., 2019; Ly et al., 2022; Merhi et al., 2020; Migliore et al., 2022; Nawi et al., 2022; Oliveira et al., 2014; Yaseen et al., 2022)	32
SUNO	Subjective norms	The person perceives that the preponderance of significant persons in his lifecycle believe he should or should not engage in the activity (Fishbein & Ajzen, 1975).	(Al-Okaily, Alqudah, et al., 2022; Chang et al., 2021; Flavian et al., 2020; Liébana-Cabanillas et al., 2017; Hassan et al., 2018)	(Daragmeh et al., 2021; de Luna et al., 2019; Giovanis et al., 2019; Ho et al., 2020; K.Y. Lin et al., 2020; Phonthanukitithaworn et al., 2016)	11
TRU	Trust	The client's willingness to reveal vulnerabilities to the vendor. Alternatively, trust is regarded as a crucial determinant of a healthy social relationship, and its impact on interpersonal interactions is a critical component of economic transactions (Al-Okaily et al., 2020)	(Abu-Taieh et al., 2022; Agyei et al., 2022b; Al-Saedi et al., 2020; Almaiah, Al-Rahmi, Alturise, Hassan, et al., 2022; Bailey et al., 2020; Chawla & Joshi, 2019, 2020a, 2020b; Hidayat-Ur-Rehman et al., 2022; Jain & Agarwal, 2019; Kaur & Arora, 2021; Liébana-Cabanillas et al., 2020; X. Lin et al., 2022; Ly et al., 2022; Merhi et al., 2020;	(Baganz & Lau, 2017; Kalinić et al., 2020; Salloom et al., 2019; Slade et al., 2015; To & Trinh, 2021)	32

(continued on next page)



**Table 2** (continued)

Code	Factor	Definition	Quotation (significant)	Quotation (non-significant)	Citation counts
			Narteh et al., 2017; Nawi et al., 2022; . Nguyen et al., 2021; Oliveira et al., 2014; Owusu Kwateng et al., 2019; Penney et al., 2021; Phonthanakitithaworn et al., 2016; Rabaa'i & Zhu, 2021; Sánchez-Torres et al., 2018; Sarmah et al., 2020; To & Trinh, 2021; Xin et al., 2015; Yaseen et al., 2022)		

Source: compiled by the authors

A collaboration between the TAM model and other theories, such as the Information Systems Success Model (ISSM), is one example of the TAM model's expansion. Combining ISSM and the TAM can provide a more comprehensive view of an organization's adoption, use, and success with information systems. The combination of these two models can facilitate a greater comprehension of how user acceptance of information systems can impact the success of those systems.

**3.2.2. UTAUT**

UTAUT is a framework for understanding the factors (Performance Expectation, Effort Expectation, Social Influence, and Facilitating Conditions) that influence individuals' acceptance and use of technology. This theory was initially devised by Venkatesh et al. (2003) as an attempt to combine and extend a number of previously established theories of technology acceptance.

Extensive research has employed UTAUT theory to analyze the acceptance and use of technology in a variety of contexts, including organizations and consumers. This framework helps researchers and practitioners comprehend the factors that influence the acceptance and use of technology by individuals.

The majority of articles employing the UTAUT theory utilize only one of the variables, either behavior intention or actual usage. Some articles do not use moderating variables such as age, gender, and experience, as well as voluntariness, in accordance with the UTAUT theory model. Some articles expand the UTAUT theory by incorporating additional variables, such as Security and Sensitization, and moderating variables, such as sales volume, level of exposure, nature of trade, and legal issues (Malinga & Maiga, 2020).

UTAUT2 is a further development of UTAUT developed by Venkatesh et al., in 2012. UTAUT2 retains most of the basic elements of UTAUT by adding Hedonic Motivation, Price Value, and Habit to broaden the understanding of technology acceptance and use. The development of the UTAUT2 model can add other variables such as Trust, price value, and perceived security conducted by Merhi et al. (2020).

**3.2.3. DOI**

The study is also informed by Roger's (1995) DOI. According to the theory, technological and other developments spread throughout cultures and societies from the early stages of introduction to overall

**Table 3**  
The factors determined to be influencing the actual use of digital payments.

Code	Factor	Definition	Quotation (significant)	Quotation (non-significant)	Citation count
BIU	Behavioral intention to use	Define intention as a purposeful start to undertake something in the near future. OR the degree to which one intends to engage in a particular behavior (Venkatesh et al., 2003)	(Ahmad et al., 2020; Al-Okaily, Alalwan, et al., 2022; Carranza et al., 2021; Humbani & Wiese, 2018; Janova & Noh, 2022; Khanra et al., 2021; Koenig-Lewis et al., 2015; Kwateng et al., 2019; Malarvizhi et al., 2022; Malinga & Maiga, 2020; Masoud & AbuTaqa, 2017; Merhi et al., 2020; Milosavljević et al., 2023; Nawi et al., 2022; Okonkwo et al., 2023; Oliveira et al., 2014; Pal et al., 2021; Penney et al., 2021; Rahman et al., 2020; Rahman et al., 2022; Rootman & Krüger, 2020; Salem et al., 2019; Sánchez-Torres et al., 2018; Sarmah et al., 2020; Sharma et al., 2017; Tam & Oliveira, 2017; Teoh et al., 2013; Widayat et al., 2020; Yadgar, 2020; Yaseen et al., 2022; Yaseen & El Qirem, 2018)	-	17
FC	Facilitating conditions		(Malarvizhi et al., 2022; Malinga & Maiga, 2020; Oliveira et al., 2014; Rahman et al., 2020)	Al-Okaily, Alalwan, et al. (2022)	5
HAB	Habit		(Kwateng et al., 2019; Pal et al., 2021; Penney et al., 2021; Rahman et al., 2020)	-	4
PEOU	Perceived ease of use		(Masoud & AbuTaqa, 2017; Nguyen & Nguyen, 2022; Teoh et al., 2013)	(Ananda et al., 2020; Okonkwo et al., 2023; Sharma et al., 2017)	7
PU	Perceived usefulness		(Ananda et al., 2020; Masoud & AbuTaqa, 2017; Nguyen & Nguyen, 2022; Okonkwo et al., 2023; Rootman & Krüger, 2020; Sharma et al., 2017; Abdul-Halim, Vafaei-Zadeh, Hanifah, Teoh, & Nawaser, 2022)		7
SCR	Security		(Humbani & Wiese, 2018; Masoud & AbuTaqa, 2017)	Rootman & Krüger, 2020; Teoh et al., 2013	5
TRU	Trust		(Al-Okaily, Alalwan, et al., 2022; Salem et al., 2019; Sarmah et al., 2020; Sharma et al., 2017)	(Kwateng et al., 2019; Sánchez-Torres et al., 2018; Teoh et al., 2013)	7

Source: compiled by the authors

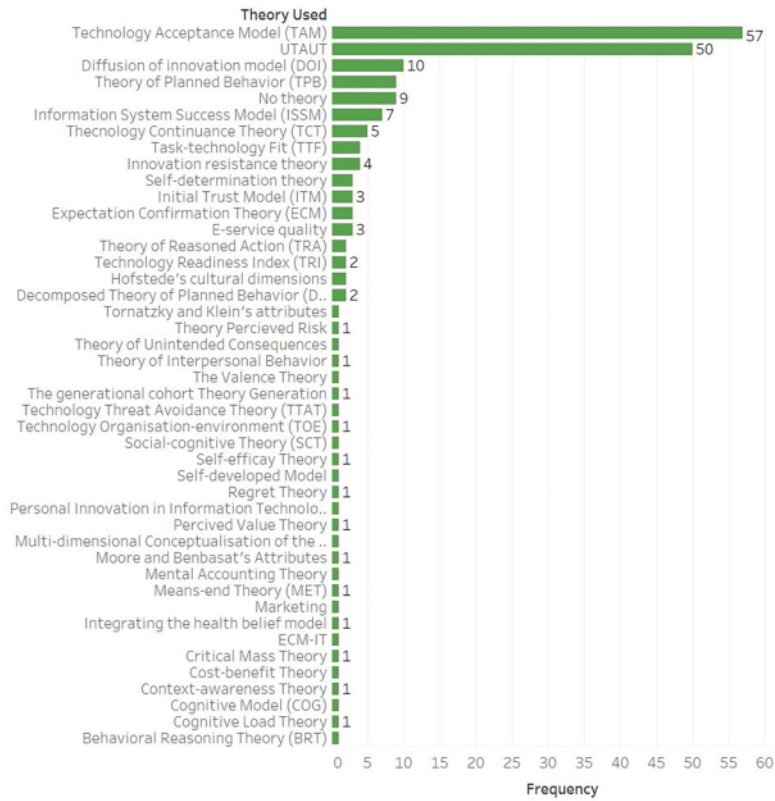


Fig. 3. Theory/model used in past studies.

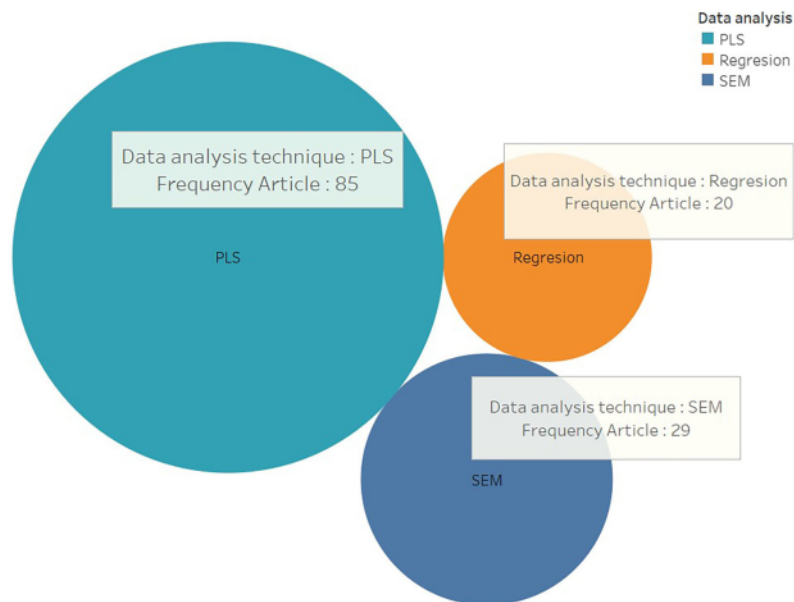


Fig. 4. Method.

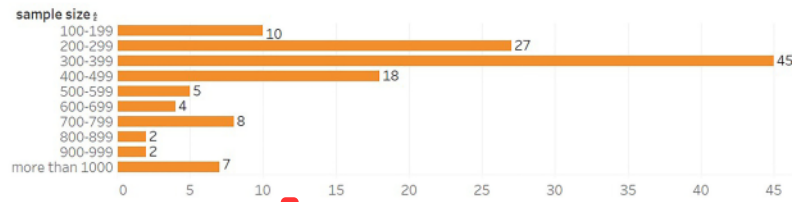


Fig. 5. The sample size was chosen in the past research.

acceptance. Rogers (2003) defines the diffusion process as the association of an innovation with a communication channel that conveys it to society or within a social system. The theory aims to explain why and how new ideas become widespread and popular. Researchers have utilized DOI as a framework in various disciplines, including communications, political science, economics, and information systems, and it is regarded as a landmark theory because it depicts the diffusion process of an innovative product. DOI hypothesized that innovations have five characteristics, namely relative advantages, complexity, Triability, observability, and compatibility.

According to research (Ho et al., 2020), the TAM and DOI theories are quite similar; their research assumes that the concept of "relative advantage" is similar to "perceived usefulness" and uses perceived usefulness in lieu of relative advantage. In addition, "complexity" has been replaced with "perceived ease of use." Results indicate that compatibility and perceived usefulness influence attitude. Where attitude influences intention behavior, Triability and perceived ease of use have no effect on attitude.

#### 3.2.4. Other theories

Theories that are applied in several studies, for example, the theory of planned behavior (TPB). TPB is an extension of the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975), which holds that individual behavior is primarily influenced by behavioral intention (BI) to execute an action, which is in turn determined by attitude (ATT) and subjective norms (SUNO). TPB extends the TRA by considering situations in which individuals lack complete control over their behavior (Ajzen, 1991). For this reason, a new variable, perceived behavioral control (PBC), is proposed to convey individuals' perceptions of internal and external behavioral constraints. Within the context of digital payment adoption, PBC characterizes consumers' perceptions of the knowledge, resources, and opportunities necessary to utilize the service. Several studies have used this theory in their research (Flavian et al., 2020; Giovanis et al., 2019).

ISSM is a framework or method for measuring the success of an information system's implementation. Developed in 1992 by DeLone and McLean. This paradigm includes six dimensions: including System Quality, Information Quality, Service Quality, usage intent, user satisfaction, and net benefits. This theory is utilized in research (Almaiah, Al-Rahmi, Alturisi, Alrawad, et al. (2022), in which the findings indicate that factors such as information quality, service quality, and system quality influence user satisfaction and behavioral intentions regarding the use of digital payments.

Theoretical and conceptual knowledge is essential for analyzing the acceptability of solutions. In this investigation, the authors identify underexplored theories and present new models. Despite the fact that TAM and UTAUT have been identified as the most relevant technology acceptance theories, other models, such as Behavioral Reasoning Theory (BRT), Cognitive Load Theory, Cognitive Model (COG), Context-awareness Theory, Cost-benefit Theory, Critical Mass Theory, ECM-IT, Marketing, Means-end Theory (MET), Mental Accounting Theory, Moore and Benbasat's Attributes, Multi-dimensional Conceptualisation of the Perceived Value, Perceived Value Theory, Personal Innovation in Information Technology (PIIT), Regret Theory, Self-developed Model,

Self-efficacy Theory, Social-cognitive Theory (SCT), Technology Organisation-environment (TOE), Technology Threat Avoidance Theory (TTAT), The generational cohort Theory Generation, The Valence Theory, Theory of Interpersonal Behavior, Theory of Unintended Consequences, Tornatzky and Klein's attributes, Decomposed Theory of Planned Behavior (DTPB), Hofstede's cultural dimensions, Integrating the health belief model, Technology Readiness Index (TRI), Theory of Reasoned Action (TRA), Theory Perceived Risk, E-service quality, Expectation Confirmation Theory (ECM), Initial Trust Model (ITM), Self-determination theory, Innovation resistance theory, Task-technology Fit (TTF), Technology Continuance Theory (TCT) have also been identified as being significant. Recent research has shown that these are highly pertinent.

#### 3.3. Methodology

Various methodologies, including SEM, PLS-SEM, and multiple regression, have been employed in prior research to investigate the factors that influence digital payments. PLS-SEM is the most extensively used method. The conceptual model is analyzed, and hypotheses are evaluated using partial least squares structural equation modeling (PLS-SEM). According to Hair et al., 2017, the PLS-SEM method is appropriate for evaluating non-normal data, such as the data evaluated in this study. Moreover, Abikari et al. (2022) suggested that PLS-SEM is appropriate for predictive purposes when investigating path models with more than five constructs and tiny sample sizes. As suggested by Hair et al. (2017), the conceptual model was evaluated using SmartPLS software.

Some articles test importance-performance map analysis (IPMA) in addition to applying the outer model and inner model in PLS-SEM. IPMA extends PLS estimation of structural equation model relationships and adds new dimensions to latent construct analysis (Hair et al., 2017).

Some investigations use PLS-MGA (partial least squares-multi group analysis) for group comparison testing. PLS-MGA is utilized to assess model relationship quality. PLS-MGA is justified by the non-normal distribution of data and the advantages of a non-parametric confidence set approach. PLS-MGA is a non-parametric approach for comparing PLS model estimates derived from path models within each group. A p-value of less than or equal to 0.05 indicates a statistically significant difference between groups (Henseler, 2015).

AMOS software is utilized for data processing in SEM-based articles. Variance-based structural equation modeling (VB-SEM) models are derived from the theory of general dependency relationships. The model is conceptualized as a systematic integration of relationships to justify various given phenomena, which provides an explanation to differentiate the variables that play a role from the factors and variables that result from the dependency relationship. The objective of the explanatory model is theory; the framework for theoretical justification is based on the premise that SEM validates guidelines and their reasoning to provide a theoretical framework, not to validate empirical results. To demonstrate conceptual validity, a researcher examines relationships and variation from a theoretical (Hair et al., 2020). AMOS is one of the most advanced statistical programs for multi-group SEM analysis, providing all essential evaluation measures for model fit, measurement, and structural models (Agardi & Alt, 2022).

Several articles conducted several methods in the research, such as Abikari et al. (2022), which used SEM and artificial neural network (ANN). In this study, SEM and ANN are used to validate and predict research outcomes. ANN is used to classify data and predict research results, whereas SEM is used to assess the relationship between variables established in the research model. Using SEM, we found that factors such as performance expectation, effort expectation, perceived risk, perceived trust, social influence, and service quality influence behavioral intentions, whereas facilitating conditions have no effect. In addition, behavioral intentions influence word-of-mouth and facilitating conditions (relative to the intent to continue using). In addition, the findings demonstrate that all moderating variables influence the behavioral intention to continue using m-banking applications. In the meantime, the ANN results indicate that the ML classification model can accurately predict whether consumers will continue to use the m-banking application.

Some studies used Bartlett's and KMO (Kaiser-Meyer-Olkin) sphericity tests before conducting hypothesis testing. Before conducting hypothesis testing, the suitability of the data for factor analysis and measurement validation was evaluated. Using the Kaiser-Meyer-Olkin (KMO) measure of sampling accuracy and Bartlett's test of sphericity, it was determined whether the data were suitable for factor analysis. Both measures (KMO = 0.95; recommended level: range 0–1; Bartlett's test: recommended p value < 0.05) (Tabachnick & Fidell, 2019). Before conducting factor analysis, these two experiments were conducted to determine if the data satisfied the necessary assumptions.

#### 3.4. Factors that influence the intention and actual use of digital payments

This research aims to identify the variables that influence the intention and actual use of digital payments and the current research trends in this area. Table 2 is a variable that has been examined by numerous researchers in relation to an individual's intent to use digital payments. The following variables are identified as the most frequent things that make it more likely that someone will intend to use digital payments.

##### 1. ATT

According to the findings of previous research, there were 23 research articles between ATT and BIU, of which 21 stated that ATT had an effect on BIU. One article stated that it had no effect. EE According to research (Carranza et al., 2021), the attitude toward e-banking has a substantial effect on the intent to use e-banking. When e-banking users have a favorable attitude toward using e-banking, this will have an effect on their intention to use e-banking. Consequently, attitude is regarded as a crucial factor in determining the intention to utilize e-banking. In prior research, ATT toward BIU has also been shown to be moderated by age and gender (Kishore & Sequeira, 2016) or Word of mouth (Zamil et al., 2022).

##### 2. CPMA

According to the findings of prior research, there were 11 articles of research between CMPA and BIU, 10 of which stated that EE had an effect on BIU. The remaining article states it has no impact. The results indicate that CMPA plays a significant role in influencing users' intentions to implement a mobile wallet. Greater CMPA will align the values, experiences, personality, and preferences of users with the technology, resulting in favorable intentions (Chawla & Joshi, 2019). In moderation, CMPA on BIU can be moderated by the variables Personal Innovativeness, Disposition to (Senali et al., 2022) and PE, EE (W.R. Lin et al., 2020).

##### 3. EE

According to the findings of prior research, there were 31 articles of research between EE and BIU, of which 14 stated that EE had an impact

on BIU. The remaining seventeen articles stated that it was without effect. Users' expectations of effort are related to their expectations of convenience. When consumers perceive that digital payment is simple and requires little effort, they are more likely to intend to use digital payments. Prior research has established a significant correlation between user expectation of effort and intent to adopt digital payments (Abikari et al., 2022; Abu-Taieb et al., 2022; Rahi, Othman Mansour, et al., 2019).

##### 4. FC

According to the findings of previous research, there were 22 articles of research between FC and BIU, of which 14 stated that FC had an effect on BIU. The remaining six articles indicate it has no effect. Chawla and Joshi (2019) research found that FC has a positive effect on BIU; this study employs PLS-SEM to estimate and assess the hypothesized model. The results show that factors such as PEOU, PU, TRU, SCR, FC, and CMPA have a significant impact on consumer attitudes and intention to use digital wallets. Several articles also investigate the effects of FC on BIU that are moderated or mediated by ATT (Chawla & Joshi, 2020a), and User satisfaction (Siyal et al., 2019).

##### 5. HM

According to the findings of previous research, there were 15 research articles between HM and BIU, of which 7 stated that HM had an effect on BIU. The remaining eight articles state they are ineffective. Several articles examine HM on BIU as moderated by User satisfaction (Siyal et al., 2019) and Payment difference (X. Lin et al., 2022) as well.

##### 6. PE

According to the findings of previous research, there were 32 articles of research between PE and BIU, of which 26 stated that PE had an impact on BIU. According to the remaining seven articles, it has no effect. Several articles also investigate the effects of PE on BIU when moderated by ATT (Chang et al., 2021), gender (Oliveira et al., 2014), dan payment difference (X. Lin et al., 2022).

##### 7. PEOU

According to previous research, there were 21 research articles between PEOU and BIU, of which 16 stated that PEOU had an impact on BIU. PEOU has a significant positive effect on behavioral intention to use m-banking in the Thai sample. This is corroborated by previous research, specifically To and Trinh (2021), Tavera-Mesias et al. (2022), and Singh et al. (2020). In contrast, in the Australian sample, there is no significant relationship between PEOU and behavioral intention. This may be due to the fact that Australians have more experience with m-banking and mobile technology, have moved beyond the need for an easy-to-use format, and are now investigating more complex systems. The remaining five articles indicate it has no effect. Several articles investigate the influence of PEOU on BIU moderated by ATT (Chang et al., 2021; Chawla & Joshi, 2020a), PU (Chang et al., 2021; Daragmeh et al., 2021), Personal Innovativeness and Disposition to Trust (Senali et al., 2022).

##### 8. PEVA

According to the findings of prior research, there were 13 articles of research between PEVA and BIU, of which 11 stated that PEVA had an effect on BIU. According to the remaining two articles, it has no effect. Several articles analyzed PEVA on BIU moderated by ATT (Chang et al., 2021), awareness (Al-Okaily, Alalwan, et al., 2022), User satisfaction (Siyal et al., 2019) and Payment difference (X. Lin et al., 2022).

## 9. PR

There were 33 articles of research on PR and BIU, and 21 of those articles stated that PR had an effect on BIU. The remaining twelve articles state that it is ineffective. Some articles examine PR on BIU moderated by Perceived Certainty (Almajali et al., 2022), TRU (Al-Okaily, Alqudah, et al., 2022), PEVA (Pham et al., 2019), Personal Innovativeness dan Disposition to Trust (Senali et al., 2022).

## 10. PU

According to the findings of previous research, there were 39 articles of research between PU and BIU, of which 34 stated that PU had an effect on BIU. Prior research has determined that the perceived benefits of consumers have a positive relationship with their intent to accept digital payments (Senali et al., 2022; Siyal, Hongzhuan, & Gang, 2021; Wu et al., 2017; Zhang & Kang, 2019). The remaining five articles expressed no effect statements. Some articles investigate PU on BIU moderated by ATT (Chang et al., 2021), age & gender (Chawla & Joshi, 2020b), Personal Innovativeness and disposition to Trust (Senali et al., 2022), Satisfaction (George & Sunny, 2022).

## 11. SCR

According to the findings of prior research, there were 16 articles of research between SCR and BIU, of which nine stated that SCR had an effect on BIU. According to the remaining seven articles, it has no effect. Several articles also investigate PR on BIU moderated/mediated by PEOU, PU (Leong et al., 2021), and Openness (Zhang & Kang, 2019).

## 12. SI

According to the findings of previous research, there were 32 articles of research between SI and BIU, of which 23 stated that SI had an impact on BIU. The remaining nine articles state that it is without effect. Several articles have also examined SI on BIU moderated/mediated by User satisfaction (Siyal et al., 2019) and Payment difference (X. Lin et al., 2022).

## 13. SUNO

Previous research determined that there were 11 research articles between SUNO and BIU, of which five stated that SUNO had an effect on BIU. Based on previous research (Al-Okaily, Alalwan, et al., 2022; Chang et al., 2021; Daragmeh et al., 2021) subjective norms have a positive effect on behavioral intention to use digital payments. The remaining six articles indicate it has no effect. Several articles analyzed PR on BIU moderated by awareness (Al-Okaily, Alqudah, et al., 2022), ATT (Chang et al., 2021), PU (Daragmeh et al., 2021), word-of-mouth (Rahman et al., 2022; Zamil et al., 2022).

## 14. TRU

Previous research determined that there were 32 research articles between TRU and BIU, of which 30 stated that SUNO had an effect on BIU. The remaining six articles indicate it has no effect. Several articles examine PR on BIU moderated by age, gender, and satisfaction (Chawla & Joshi, 2020b), Satisfaction (George & Sunny, 2022),

Meanwhile, the following are the most prevalent factors that affect the use of digital payments:

## 1. BIU

Previous research determined that there were seventeen research articles between BIU and AU, all of which stated that BIU had an impact on AU.

## 2. FC

According to the findings of previous research, there were five articles of research between FC and AU, of which four stated that FC had an effect on AU. The remaining single article states that it is without effect.

## 3. HAB

According to the findings of previous research, there were four articles examining the relationship between HAB and AU, all of which concluded that HAB had an effect on AU.

## 4. PEOU

Previous research revealed that there were seven research articles between PEOU and AU, of which three stated that PEOU influenced AU. According to the remaining four articles, it has no effect. PEOU has a significant positive effect on AU (Masoud & AbuTaqa, 2017; Nguyen & Nguyen, 2022; Teoh et al., 2013). According to Teoh et al. (2013) research, respondents feel that e-payment channels have an intuitive structure and content. They discovered that learning to use electronic payments requires minimal effort. The instructions are very explicit, and the number of steps required to complete a transaction has been minimized for the convenience of the user. In fact, some providers have also provided their customers with tutorials and/or guidance on how to use various e-payment channels. Related to moderating variables, Salimon et al., 2017 investigated PEOU on AU in HM moderation.

## 5. PU

According to the findings of previous research, there were seven articles of research between PU and AU, all of which stated that PU had an effect on AU. Related to moderating variables, Salimon et al., 2017 investigated PU on AU in HM moderation.

## 6. SCR

According to the findings of previous research, there were five articles of research between SCR and AU, of which three stated that SCR had an effect on AU. According to the remaining two articles, it has no effect. Related to moderating variables, Salimon et al., 2017 investigated SCR on AU in HM moderation.

## 7. TRU

According to the findings of previous research, there were seven research articles between TRU and AU, of which four stated that SCR had an effect on AU. It is stated in the remaining articles that it has no effect. There were no moderation variables discovered to examine TRU on AU.

## 4. Discussion

This section provides a discussion of future research directions.

## 4.1. Theories used and collaboration with other theories

Future research should consider using the TAM Theory (Technology Acceptance Model) as the main theoretical framework, as it has proven to be effective in explaining technology adoption. However, to gain more comprehensive insights, it is recommended to integrate TAM Theory with other theories such as ISSM (Information Systems Success Model), UTAUT (Unified Theory of Acceptance and Use of Technology), or DOI (Diffusion of Innovation). According to the Okonkwo et al. (2023) study, which combines TAM, DOI, and ISSM theories. This study applies PEOU and PU variables to the TAM theory. Additionally, DOI

theory employs compatibility, image, and comparative advantage variables. Information quality, system quality, and service quality are variables utilized by ISSM theory. This study determined that relative advantage, PU, information quality, system quality, and service quality have a positive effect on the adoption of digital wallets in Cameroon. In contrast, image has a negative effect, which suggests that poor perception or a negative image may impede the adoption of digital wallets. Compatibility and PEOU factors did not have a significant impact on the adoption of digital wallets in Cameroon.

If future researchers use UTAUT Theory, it is necessary to consider how cultural factors or the hostefed dimension, can be moderated to better understand their influence on user behavior in adopting digital payments. In Merhi et al. (2020) research, which examined the moderating effects of individualism, uncertainty avoidance, power distance, and long-term oriented dimensions proposed by Hofstede, only the uncertainty avoidance dimension revealed statistically significant differences between SI and BIU. This relationship was stronger in cultures (Italy) with high uncertainty avoidance than in cultures (China) with lower values. The remaining three dimensions were not empirically verifiable.

#### 4.2. Research sample

Future research in highlighting the sample size, where the sample size is sought as much as possible because of the limited sample size, raises questions about generalization. And can do sampling with regional stratification across the geographical area of the country sample. Considering that countries with continental dimensions have cultural variations. Then To improve the generalizability and accuracy of the findings, future studies should consider using a larger sample size in various geographical locations for countries with continental dimensions.

For future research, it is recommended to consider selecting multiple countries as the research sample, as this may enable benchmarking of digital payment adoption across different cultural contexts. Analysis of differences in user behavior from different countries can provide greater insight (Akhtar et al., 2019; Flavian et al., 2020; Ho et al., 2020). Based on Ho et al. (2020) research, ATT and perceived behavioral control influence behavioral intentions to adopt mobile banking services, whereas in Taiwan, attitudes have a greater impact on user intentions. In Taiwan, innovativeness has no effect on the intention to use mobile banking, whereas in Vietnam, it is a significant factor. This indicates that innovative users in Vietnam are more likely to investigate and utilize mobile banking services. Subjective norms were not found to have a significant impact on mobile banking adoption intentions. This may be due to the private character of banking transactions in the context of mobile banking. In addition, the organisational environment rather than the individual environment may influence the decisions of consumers. Due to the unpopularity of mobile banking in Taiwan and Vietnam, respondents may believe that their reference groups lack sufficient knowledge of the service.

#### 4.3. Methodology

Future research should consider using the PLS-SEM (Partial Least Squares Structural Equation Modeling) method as the main analysis method, as it addresses the research questions well. Along with that, it is advisable to involve IPMA (Importance-Performance Map Analysis) to identify the importance and performance of variables in the context of digital payment adoption. Previous research has analyzed IPMA To finalize the PLS-SEM (Carranza et al., 2021; Eren, 2022; Khayer & Bao, 2019; Liébana-Cabanillas, Singh, Kalinic, & Carvajal-Trujillo, 2021; Nawi et al., 2022). As an example, Eren conducted an IPMA analysis to conclude the PLS-SEM model. The outcomes obtained. For example, Eren conducted an IPMA analysis. To conclude the PLS-SEM model. The outcomes obtained Normalised cumulative effect. The importance score

for the optimism variable was (0.284). Followed by system quality (0.185), perceived transaction speed (0.176), information quality (0.160), service quality (0.063), and perceived risk (0.046). The highest performance rating was for optimism (88.113), followed by perceived transaction speed (82.725), system quality (82.318), information quality (80.946), service quality (52.045), and perceived risk (41.510). Therefore, to enhance the consumer experience, the perceived risk and service quality should take precedence.

Before conducting hypothesis testing, Bartlett's and KMO (Kaiser-Meyer-Olkin) sphericity tests should be involved, which are used to consider the fit of the EFA before hypothesis analysis (Akhtar et al., 2019; Alam et al., 2021; Bailey et al., 2020; Eren, 2022). Typically, the analysis process begins with Exploratory Factor Analysis (EFA), followed by evaluating the model's validity and fit with indices such as Kaiser-Meyer-Olkin and Bartlett's test. If the KMO coefficient value is less than 0.5 and the significance level of the Bartlett's test is less than 0.05, factor analysis is deemed appropriate. This procedure determines whether EFA is an appropriate method for the available data (Nguyen & Nguyen, 2022).

Looking at the fit for the variables Innovativeness, stress, PEOU, SAT, PU, PR, TRU to BIU. Liébana-Cabanillas et al. (2020) research discovered that in the first phase, his research used Exploratory Factor Analysis (EFA) to determine the level of unidimensionality of the scales. The findings indicated that this analysis was appropriate for the variables under study because (1) the proportion of variance of all variables (based on the Kaiser Meyer Olkin, KMO coefficient) always exceeded the value of 0.5, indicating sample adequacy; and (2) Bartlett's test of sphericity revealed a significance or p-value of 0.000, rejecting the null hypothesis that there is no difference between the correlation matrix and the identity matrix.

In addition, future research could explore combining methods such as SEM and ANN to gain deeper insights, such as research conducted by Hidayat-Ur-Rehman et al. (2022), who employs the diffusion of innovations theory as a grounded theory to propose a research model that incorporates convenience, perceived safety, personal innovativeness, and perceived trust in order to investigate the determinants of consumers' intention to use m-wallets. A two-pronged strategy involving Structural Equation Modeling-Integrated Neural Network (SEM-ANN) was employed: First, PLS-SEM was used to identify the significant determinants of intention to use. Second, the ANN method was utilized as a robustness measure to validate the PLS-SEM results and estimate the relative significance of the SEM-based significant determinants. Our findings corroborate that compatibility, ease of use, observability, convenience, relative advantage, personal innovativeness, perceived trust, and perceived security are the primary determinants of m-wallet usage intent. In addition, we confirmed that the perception of security is the most influential predictor of intent to use. The results of ANN have supplemented those of PLS-SEM, but differences in the order of influential factors were also observed.

#### 4.4. Factors affecting intention and actual Use

In future research, it is recommended to examine factors that have been shown to influence intention and actual use in the context of digital payments. Variables such as ATT, CMPA, EE, FC, HM, PE, PEOU, PEVA, PR, PU, SCR, SI, SUNO, and TRU that are relevant can be the main focus.

In future research it can explore more deeply how moderating variables such as HM affect the effect of PEOU on AU, PU with AU, SCR with AU (Salimon et al., 2017). Further research can also use moderator variables such as age, gender, experience, and culture. According to research Akhtar et al. (2019), in the research focuses on the cultural differences between China and Pakistan that influence individuals' intent to employ m-banking. Regarding the adoption of this technology, each nation responds differently to a number of factors. Where PU, SI, and PEOU influence intention in Pakistan. In China, however, only PU influences intention. The study also revealed that cultural differences

moderate the association between SI and the intention to employ m-banking. This emphasizes the significance of incorporating local cultural values into strategies designed to promote technology adoption.

Future research can also compare the use of one system with another (de Luna et al., 2019), women versus men (Merhi et al., 2020), early respondents versus late respondents (Oliveira et al., 2014), current users versus potential users (Phonthanukitithaworn et al., 2016), Consumers Who Had Used Mobile Payment versus Consumers Who Had Never Used Mobile Payment (W.R. Lin et al., 2020). The research conducted by de Luna et al. (2019) compares three mobile payment systems in Spain: SMS, NFC, and QR codes. According to the findings of this study, there are disparities between the factors that influence usage intentions. Subjective norms and social influence are the most important factors in the SMS mobile payment system, followed by perceived usefulness, attitude, perceived ease of use, and perceived security. Subjective norms, perceived usefulness, attitude, perceived simplicity of use, and perceived security have a greater impact on NFC mobile payment systems. In QR mobile payment systems, perceived usefulness has the greatest impact on usage intention, followed by subjective norms, perceived ease of use, attitude, and perceived security.

Based on Merhi et al. (2020) research, the results showed that consumer behavioral intentions in using mobile banking services were significantly moderated by age, through its relationship with facilitating conditions and trust in Lebanese respondents, as well as performance expectations, effort expectations, hedonic motivation, price value, and habits in British respondents.

The selection of these factors should be based on previous findings linking them to technology adoption behavior. The integration of these factors into the analysis model will make a more valuable contribution to the understanding of digital payment intention and usage.

#### 4.5. Theoretical implications

The combination of multiple theories, such as TAM Theory with UTAUT Theory or Tam with ISSM, DOI has the potential to provide a more comprehensive view of digital payment adoption. The implication is a better theoretical understanding of the factors that influence user adoption of digital payment technologies. In addition, incorporating moderating variables such as ATT, HM (Hedonic Motivation), and user satisfaction, as well as moderating variables such as age, gender, and experience can better identify nuances in user behavior. This results in a deeper understanding of how these factors affect the relationship between important variables in the model, which can lead to more revolutionary discoveries at the theoretical level. As a result, this research can contribute significantly to the development of a more rigorous theoretical framework for understanding digital payment adoption and its implications for business strategy development and decision-making.

#### 4.6. Managerial implications

Digital payments have become an indispensable service that enables consumers to complete remote financial transactions. It offers customers complete control over their financial information and transactions and various options to suit their requirements. Banks and financial organizations can reduce operational budgets with digital payments while maintaining customer satisfaction and attracting new customers (Abu-Taieh et al., 2022).

By understanding the significant factors that are frequently studied, businesses can develop digital payment products and services that are more in accordance with the preferences and needs of customers. Such as enhancing transaction security through the use of stronger encryption technology or training employees in the detection of potential security threats, as well as simplifying the user experience, it is possible to increase utilization intentions.

The study's findings have significant consequences for banking institutions, financial institutions, telecommunications companies, and

online merchants that currently offer or intend to offer digital payment services. Using the ISSM theory, businesses are able to identify areas for improvement based on dimensions such as system quality, information quality, and service quality. This can assist them in allocating resources and enhancing their digital payment services.

Using ISSM can assist management in making better decisions regarding investments in technology and the development of new systems. By monitoring user satisfaction, businesses can identify issues that may affect the user experience and take the necessary steps to enhance it. Understanding the factors that influence user adoption of digital payment technology can be enhanced by combining TAM and ISSM. This can assist businesses in developing more efficient marketing and education strategies.

With a greater comprehension of the factors that affect the age and usage of digital payments, business stakeholders such as payment service providers can adjust their marketing strategies accordingly. This could include advances in the provision of user experience and more precise targeting based on age, gender, and user experience.

Future research could examine the impact of HM in moderating PEOU on AU, which would allow digital payment service providers to create more appealing and emotionally stimulating features for their customers. This should involve more user-friendly interface designs or more alluring incentives.

In fact, future research can investigate the moderating influence of age, gender, and experience, with the results guiding the development of more effective training and education programs by organizations. For instance, certain groups with a significant influence on the intention and actual utilization of digital payment technology can receive more specialized training.

## 5. Conclusion

Future research may combine theories like TAM, UTAUT, DOI, and ISSM. Future research can aim for a sample that is as representative as possible and also consider sampling by dividing geographical areas proportionally across the extensive country's territory. This is owing to the significant cultural differences between countries of continental size.

Future research may employ a combination of methodologies, such as SEM and ANN, or, prior to conducting factor analysis, may analyze data using Bartlett's and KMO (Kaiser-Meyer-Olkin) sphericity tests. If the research employs PLS-SEM, IPMA analysis can continue. Future research could examine the potential moderating or mediating factors of digital payment adoption or the potential mediating effects of various factors. Future research should examine moderation and mediation concerning adopting digital payment systems. In addition, research contrasting the adoption of digital payments among consumers in different countries and cultures will aid in comprehending the factors that drive digital payment adoption. Cross-cultural and international comparative analysis can yield profound insights. In the future, segmentation analysis will determine the level of user maturity regarding digital payment adoption by identifying distinct user clusters (Chawla & Joshi, 2020a).

The next study can proceed to a meta-analysis. Meta-analysis is a component of quantitatively oriented systematic review methods (Siswanto, 2010). It can also focus on a systematic literature review by focusing on one or several specific theories, certain areas, and certain variables.

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## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data availability

The authors do not have permission to share data.

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