

# Digital Payments adoption in emerging markets: the context of China's digital currency electronic payment

## Abstract

There are still significant gaps in our knowledge of the factors that influence the acceptance and use of digital wallets as well as their transformative effects on payment behaviours in China, even though digital wallets are anticipated to grow in line with the global trend towards cashless payment solutions and despite the quick development of mobile payment platforms. With the aim of providing relevant advice to stakeholders and contributing to the continuing conversation on technology adoption, payment behaviour, and socioeconomic dynamics in China, this research investigates trends in the acceptance and use of digital wallets in the Chinese area. Additionally, it intends to provide insightful information on the function of digital wallets inside the mobile payment system and their influence on China's socioeconomic environment. The research model was experimentally briefed using a questionnaire survey of 405 digital wallet-based users in China. Hedonic motivation and perceived risk, both of which were found to have an influence on the usage of digital wallets, were included to the study in this work. The Unified Theory of Acceptance and Use of Technology (UTAUT) paradigm served as a guide for the study, which was based on existing academic research. The main contributions of this research are to highlight the critical roles that perceived delight and perceived risk play in the adoption of digital wallet technology and to investigate how Chinese individuals perceive the use of digital wallets. The study surfaced the following influences performance expectation (H1), effort expectation (H2), social influence (H3), social impact (H4), facilitation conditions (H5), behavioural intention (H6), and perceived risk (H7). social influence (H3), social impact (H4), facilitation conditions (H5), behavioural intention (H6), hedonic motivation (H7), and perceived risk (H8). All have an impact on the use of digital wallets.

**Keywords;** Mobile payments, Digital wallets, China, Usage, Unified Theory of Technology Acceptance (UTAUT)

## Introduction

The combination of mobile technology and payment systems has resulted in the rise of mobile or digital wallets, which have replaced the traditional physical wallet (Sharma, Mangla, Luthra, & Al-Salti, 2018). A digital wallet is an app-based utility for making online payments. Wallets serve as secure repositories for virtual representations of debit and credit cards, therefore obviating the need to manually enter card details or carry a tangible card during payment transactions. One of the FinTech services acquiring prominence in the consumer retail sector is digital wallets or mobile payments (Hasan et al., 2021). Digital wallets are gaining popularity as a payment method globally, with mobile payments accounting for a significant portion of overall payment transactions (China Internet Network Information Centre, 2021). China has become a global leader in digital wallet adoption and usage, with Alipay and WeChat Pay dominating the mobile payment market with a combined market share of over 90% (China Internet Network Information Centre, 2021). Alipay and WeChat Wallet are the main ones, with a share of 88 per cent.. The Chinese government's support for a world where all transactions take place electronically and there is no need for real money has significantly increased the use of digital wallets in China. Consequently, Aveni and Roest (2017) point out that China's widespread use of mobile payment technologies provides a glimpse towards a future when cash

is obsolete. This trend is exemplified by the substantial number of individuals utilising mobile payments, which exceeded 802 million users in 2020 (China Internet Network

Information Centre, 2021). The trend is indicative of China's overarching transition towards digitalization, underscoring the increasing significance of mobile technology in daily existence. The proposition posits that the prevalence of mobile digital wallets is increasing as society progresses towards a state of less reliance on physical currency. E-wallets and e-money are related concepts in the field of digital finance, but each has a different function and principle. e-wallet (electronic wallet) is primarily a digital system for securely storing a user's payment information and passwords and facilitating transactions such as purchases, whereas e-money (electronic currency) is a digitally stored monetary value that is typically used to make payments to an entity other than the issuer, like the digital equivalent of cash. e-wallet's primary function is to facilitate transactions, not to store value, while e-money itself is a store of value. They also differ in terms of regulatory frameworks, use cases and security: e-wallet is usually subject to the financial regulation of the payment method in which it is stored, while e-money is subject to more stringent regulation focused on protecting the stored value from theft or fraud.

For users of digital wallets, the security of digital wallet usage has always been a top priority. For example, will my funds stored in a digital wallet be well protected and will my privacy be compromised? Security issues can determine users' use of digital wallets ((Saini, 2023). To make matters worse, current drawbacks have been exposed due to the widespread use of digital wallets in China, and various factors influence technology usage, such as the use of digital wallets (Matemba et al., 2018).

There are also some potential drawbacks that need to be considered. One major drawback is the risk of cybercrime, as digital wallets are vulnerable to hacking and other security threats (Rathore, 2016.) This risk is magnified in countries where digital wallets are widely used, such as China, where there have been multiple incidents of cybercrime and data breaches in recent years (Xinhua, 2021).

One other drawback associated with digital wallets is to the possible erosion of privacy. Digital wallets and other forms of electronic payments require users to provide personal information that can be collected and used by companies for advertising and other purposes (Subaramaniam, 2020). Additionally, digital wallet transactions can be easily tracked and monitored, which raises concerns about government oversight and the potential for abuse of power. There are also concerns that digital wallets have the potential to increase economic inequality (Shankar & Behl, 2023). The widening disparity between those with access to digital wallets and those without may have adverse implications for both economic and social advancement. Because of the energy and materials required to manufacture and dispose of electronic devices and components, the widespread use of digital wallets may also contribute to environmental degradation (Anshari et al., 2021). The fast pace of technological change and the ever-increasing desire for new gadgets and upgrades makes this an especially pressing issue. As a result, these concerns may be more adequately addressed by this survey.

To address the above issues, this study makes a few theoretical and practical contributions. Firstly, this paper uses the UTAUT model (Perceived Risk, Hedonic Motivation) to link intentions based on the digital wallets. Although previous studies have investigated the use of digital wallets by consumers from the UTAUT model (Hsieh, 2021), few have specifically added perceived risk and perceived entertainment to empirical investigations of digital wallet use and tested for moderators.

Other scholars have argued that other theories should be introduced in addition to these models of technology adoption to ensure that theories of relevance that are still available in the popular world after the phenomenon of digital wallet adoption are still available (Leong et al., 2022). The desire to use a digital wallet has been shown

to depend on aspects including performance expectations (Patil et al., 2017). To fill this indicator gap, we extended the UTAUT model to include perceived risk and entertainment variables as well as to verify moderators. Few researchers in the present study have included perceived danger and perceived fun into the model to examine how they relate to use intention (Patil et al., 2020). Overall, this study demonstrates that digital wallets may moderate the relationship between the UTAUT model's

constituent parts and intention to use. The UTAUT model's impact on the adoption of digital wallets may also be explained in further detail thanks to this one study. Prior studies on digital wallets (Dahlberg et al., 2015; Harris et al., 2019) tested the TAM model and the UTAUT model. To take into consideration perceived risk in the Chinese study, Chang et al. (2021) enhanced the UTAUT model. In a manner like this, India's safety framework was expanded (Chang et al., 2021). This study is still being studied with regard to the relationship between the elements of the Unified Theory of Technology Acceptance and Use (UTAUT) and the adoption of digital wallet technology.

Finally, The study's background is based on Chinese citizens' desire to utilise digital wallets, which is very relevant. Based on the widespread use of digital wallets, this could also help to extend digital wallets to a wider group of consumers. For digital wallet researchers and mobile payment firms interested in the digital economy or conducting business in China, it is important to comprehend the acceptance and usage of digital wallets in that country. With an emphasis on understanding the elements that drive acceptance as well as the hurdles to adoption, the adoption and usage of digital wallets by Chinese citizens was examined in this context. By looking at these elements, we may learn a lot about China's digital economy and create plans for using technology to enhance the quality of life for Chinese consumers and enterprises. Therefore, a situational analysis based on digital wallets is current and pertinent to add to the limited knowledge about the adoption of digital wallets in developing countries like China.

The format of this essay is as follows. In Section 2, we provide a systematic literature review of current research on digital wallets in China. We discuss our

Research model construction in Section 3. Section 4 presents our collection data result. Section 5 provides our analysis. Section 6 we will show theoretical contributions, practical implications and limitation. Section 7 summarizes our research.

## **2. Literature**

### **Review 2.1 UTAUT Research**

#### **Model**

According to a survey of the relevant literature, researchers in the field of electronic payments have examined client adoption intentions using a range of theoretical frameworks.

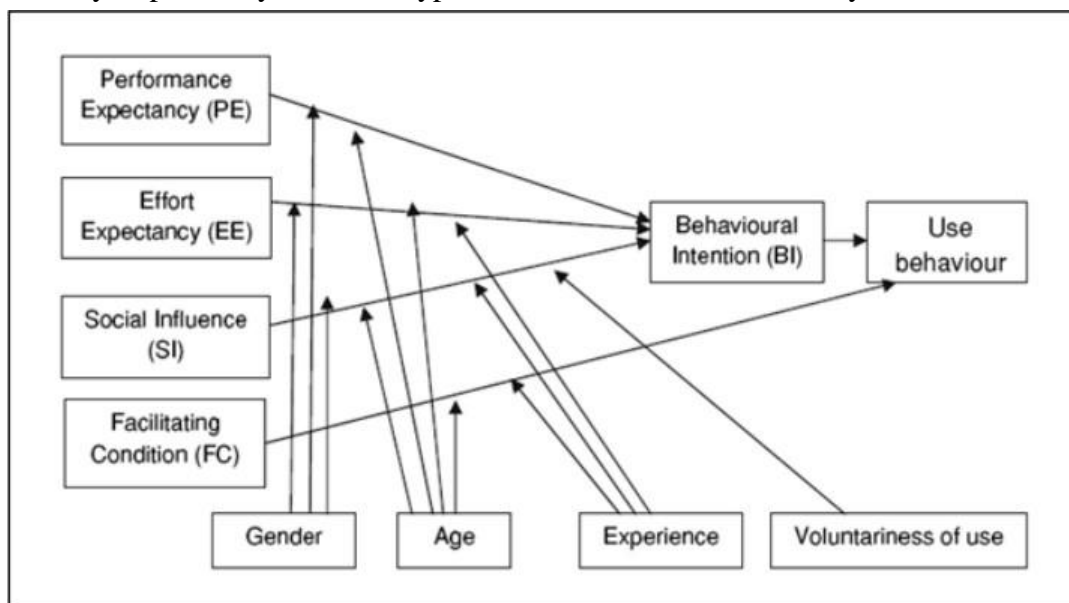
The UTAUT model provides a comprehensive framework that integrates elements of multiple technology acceptance models with a special emphasis on social impacts, which is particularly important in the Chinese culture where relationships matter. In addition, the flexibility of the UTAUT model allows it to be customised to specific situations, such as the unique dynamics of the Chinese market, which can be implemented very differently due to the differences in Chinese companies compared to Western companies, such as corporate culture, corporate goals and corporate management styles. The use of UTAUT therefore ensures that the research is based on a solid theoretical foundation, yet flexible enough to capture the nuances of the Chinese market, especially for the ever-changing Chinese market. It was able to synthesize factors and comprehensively assess all aspects affecting digital wallet adoption. Although the UTAUT model has been used in many previous digital wallet studies, the current Chinese digital wallet market has

not been comprehensively investigated, and there is relatively little relevant literature. Therefore, using the UTAUT model for the study not only ensures that the study is based on a solid theoretical foundation, but also ensures that the study is flexible enough to accurately capture and reflect the characteristics and changes in the Chinese digital wallet market.

Research on mobile payment systems has made use of the Theory of Planned Behaviour (TPB) (Ajzen, 1991), the Technology Acceptance Model (TAM) (Davis, 1989), and the Unified Theory of Technology Acceptance Use (UTAUT) models. The Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), and the Technology Acceptance paradigm (TAM) have been compared with the Unified Theory of Acceptance and Use of Technology (UTAUT) paradigm. In contrast to the TAM model, which is preferred to describe technology uptake, the UTAUT model (Venkatesh et al., 2012) takes organisational and social factors that affect adoption into consideration. In Shachak's research, the UTAUT model outperformed the TAM model and other models in terms of their propensity to predict the behaviour of mobile payment systems like digital wallets. Our understanding of how and why individuals acquire and use digital technology is based on the presumptions listed

below: To better explain why and how new technologies are welcomed and employed, The Unified Theory of Acceptance and Use of Technology (UTAUT) was created by Venkatesh and his associates. He could be able to mix eight different hypotheses (Venkatesh et al., 2003).

According to this idea, whether a user would utilise a digital wallet depends on four factors: effort, social impact, performance expectations of the user, and enabling circumstances. The Performance Expectancy (PE) of a user is their opinion of how using a digital wallet would affect their productivity at work. The idea of Effort Expectancy (EE) may be used to characterise a person's use of a digital wallet. We refer to a person's perspective of how other people see their digital wallet as having "Social Influence" (SI). "Facilitating Conditions" (FC) are a user's expectations on how to utilise a current digital wallet to its fullest potential. The user's age, gender, level of expertise, and whether or not they are using the structure freely all affect the structure's efficacy. These immediately affect one's propensity to utilise the digital wallet, which in turn encourages actual usage, along with FC. Users' behaviour is indirectly impacted by FC. This hypothesis was chosen because it synthesises



the opinions of several specialists from eight distinct angles.

Figure 1. UTAUT model

## 2.2 Digital wallet adoption in emerging markets in China

Digital wallets are famous for their advantages such as enactment and real-time innovation (Uddin et al., 2014). With the continuous development of digital wallets and paperless consumption, digital wallets are collaborating with various apps and have been used in a range of daily life areas such as cycling, food delivery, and stored value of phone bills (Rosnidah et al., 2019). Customers' demands may be met via digital wallets, which can provide a variety of easy services, which is not only beneficial to buyers, but also to trading platforms that accept digital wallets as a new way of payment due to the speed of their transactions, efficient cash management, and lower labour costs. Such transactions are carried out simultaneously from offline and online respectively, where offline customers scan the transaction using QR code in the

digital wallet (Hayashi et al., 2014). While online the transaction is usually completed by entering a password payment using a digital wallet. In China, it mainly consists of WeChat digital wallet, Alipay digital wallet and some other digital wallets. Alipay launched its mobile business, Alipay Digital Digital Wallet, which is now the largest mobile payment service provider in the world (China Internet Network Information Centre, 2021). China has the highest pace of mobile wallet growth in the world.

The number of digital wallets being created in China continues to rise. One of the "positive impacts" of the "Covid-19" epidemic has been the increased use of paperless digital wallets by customers (Sleiman et al., 2023) (Le, 2021). As of 2021, China as well reaches the mid to late stages of the transition to a cash society (Lee, 2021). The penetration and use of digital wallets in China has reached more than 90% (China Internet Network Information Centre, 2021). This data also proves that paperless consumption in China has also reached the mid-to-late stage, and the use of digital wallets has reached a mature stage. Academics have also brought up the topic of potential barriers to further user adoption of digital wallets. One of the notable developments in the field is the competition between providers of mobile payment services and the emergence of new alternatives for electronic payments, for example cashback, convenience points, group-buying offers or others. But many people have reported cases of fraud in some e-wallet mobile applications. There are many risks in the e-wallet faced, including household welfare risk (Beck et al. 2018) informal insurance networks and risk sharing (; Riley 2018), financial risk (Demirguc-Kunt et al. 2018)

The use of digital wallets has seen a notable surge in recent years, owing to the expansion of the economy and the widespread adoption of various wallet platforms. The development of mobile internet in recent years, the use of digital wallets has driven the business model of traditional electronic payments, and many scholars have made research on in digital wallets. However, the majority of research are centred in Malaysia, the United Kingdom, the America, and other countries, China is a country where digital wallets are widely used, the research is little, and UTAUT model is an information technology acceptance model, the combination of digital wallet industry and information technology is still in its infancy, The use of the Unified Theory of Acceptance and Use of Technology (UTAUT) paradigm in the context of research on the digital wallet business remains limited.

Resulting from the information technology's fast growth, many scholars have launched research on emerging technologies. However, through the literature reading, it is found that many scholars based on the technology acceptance model have done research on emerging technologies such as m-commerce, mobile Internet, mobile payment, LBS and other emerging technologies respectively, and constructed the applicable models, but there are still few studies on mobile business and digital wallet, which means that very few scholars have combined the information technology with the development of the industry. In addition, some scholars have done research on the user acceptance behaviour of array wallet services based on the UTAUT model, but because the network environment and mobile terminals were not commonly used at that time, the content of the digital wallet services at that time was also not perfect in terms of the factors affecting the implementation, and only a few academics have investigated the UTAUT model with the digital wallet in addition to the perceived risk and hedonic motivation. Therefore, the concept and execution of a digital wallet diverge.

## **Model reconstruction and assumptions**

In previous studies, I concentrate on the usage of digital wallets and satisfaction research since there is so little literature on the topic and because China is a large user of mobile payments and digital wallets.

We include two additional factors: hedonic motivation and perceived risk, which have previously been examined in earlier works by Williams et al. and Thong et al. (Williams et al., 2011; Thong et al., 2012) by adding them to the UTAUT model. First, Hedonic Motivation (HM) examines the mood of users of digital wallets, or if doing so results in a joyful experience and a sense of mental fulfilment. Second, perceived risk (PR) examines how secure locals feel using digital wallets, including if they deter theft and other losses of property and whether the security mechanism is reliable. In Figure 1, the modified UTAUT model is shown. The research covers one dependent variable, use behaviour, one mediator variable, behavioural intention, and six independent variables: performance expectancy, effort expectancy, social influence, convenience, perceived risk, and hedonic incentive.

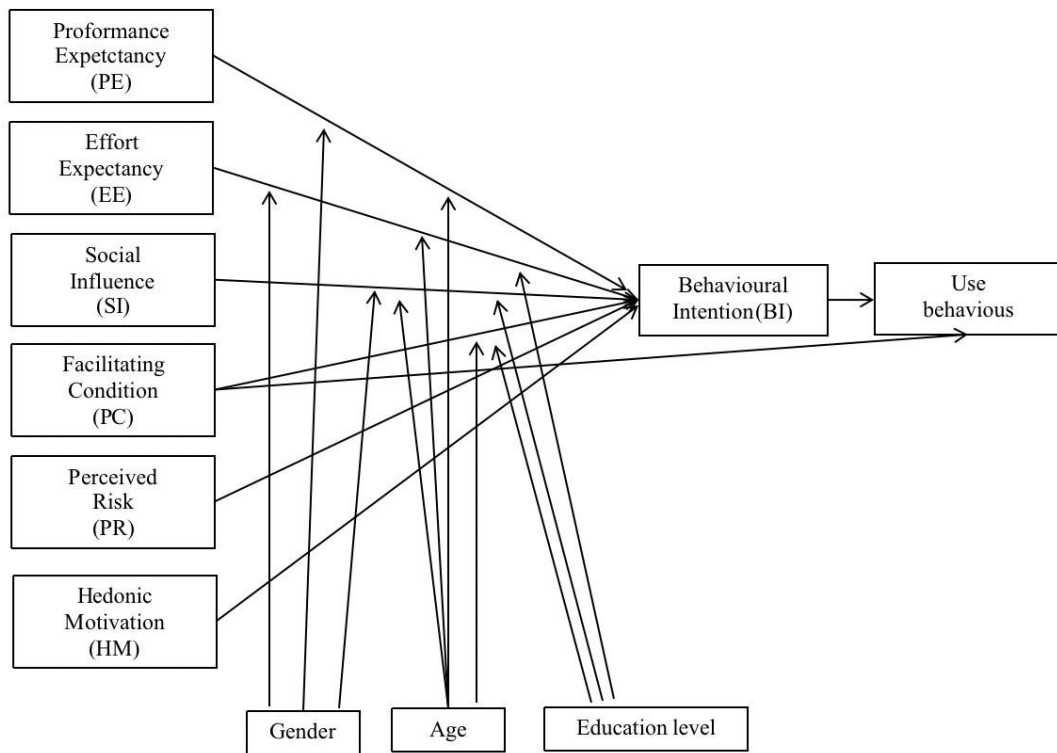


Figure 2. UTAUR research model diagram

Drawing on the research conducted by Venkatesh and colleagues (2012), the present study posits the following research hypothesis:

The capacity of an information system to provide services that satisfy customers' demands for bettering their job or learning is known as performance expectations. Or how much people believe using a new technology would help them do better in their jobs, studies, and other activities (Venkatesh, 2020). Venkatesh and others have shown that a technology's effectiveness impacts users' propensity to utilise it in a positive way, but that gender and age play a confounding role, particularly for young

males .ne may argue that people are more likely to embrace new technologies or systems when they regard them as capable of augmenting their professional or educational accomplishments. The study done by Wang et al. demonstrates that there is a considerable impact of performance expectations on the behavioural intentions of Chinese customers towards the use of digital wallets. Studies have also demonstrated that variables like perceived usefulness and confidence in the technology supplier may have an impact on how performance expectations affect behavioural intentions (Do et al., 2019). This shows that people who have high expectations for themselves may be more inclined to see technology as trustworthy and valuable, which in turn enhances their desire to utilise it. When analysing Chinese citizens' behavioural intentions towards digital wallets, performance expectations are a crucial issue to consider. Elevated performance expectations might potentially foster a more favourable impression of the technology and a heightened propensity to engage with it. Consequently, we suggest the following: H1.

H1 The performance expectations of Chinese citizens regarding the usage of digital wallets significantly influence their behavioural intentions.

Effort expectation refers to the perceived ease of use of an information system or new technology by users. Numerous existing studies have shown that effort performance positively affects or facilitates the willingness to use technology (Martins. & Popovic, .2014). Digital wallet applications with intuitive and user-friendly interfaces are expected to reduce the perceptual work required for adoption and use. According to studies on the usage of e-wallets, consumers' intentions to use the technology are favourably impacted by their expectation of effort (Singh & Sinha, 2020; Upadhyay et al., 2022). Based on empirical findings, it has been shown that individuals tend to have a higher propensity to adopt technological innovation that include characteristics of simplicity in terms of usability and comprehensibility (Ku, 2021). As a result, Chinese suppliers of digital wallets work hard to create apps with straightforward and aesthetically pleasing user interfaces that help customers engage with technology easily. An instruction manual on the programme interface also instructs users on how to use the application. Previous academic studies have thoroughly explored the influence of exertion on user intention, as shown by the works of Chawla and Joshi (2017), George and Sunny (2021), and Sarmah et al. (2020). Consequently, we suggest the following: H2.

H2 Effort expectations of Chinese residents towards the use of digital wallets have a significant positive effect on behavioural intentions.

The social effect measure shows how much a person thinks that key individuals or groups of individuals think he should utilise the new technology. (Adwan et al., 2018); (Sharma et al., 2017); (Botero et al., 2022); (Naveed et al., 2020). In their study, Ajzen argued that individuals are always influenced by others, especially those they consider important to them, such as relatives, friends, elders, mentors, etc., and that when these people have opinions about allowing themselves to use information systems, they increase their willingness and behaviour to do so. People have a strong herd mentality when it comes to using digital wallet software, and the willingness to use digital wallet software can be greatly influenced if everyone around them is using it, or if individuals are required to help others to use the program

effectively, or if individuals are required to gain general psychological or behavioural acceptance from society. Based on this, this study proposes hypothesis H3.

H3 The social influence on Chinese people's usage of digital wallets has a strong beneficial effect on behavioural intentions.

The extent to which a person feels that their organisation or the world around them is supportive of their usage of a new technology or product is referred to as a facilitative condition, also known as an enabling condition. The extent to which individuals believe the technical and organisational architecture of the system is in place to enable its use (Rosnidah et al., 2019). Leong investigated the variables affecting customers' inclinations to utilise digital wallets and other mobile payment systems. They discovered that customer intentions to utilise mobile payments were highly impacted by enabling factors such as the availability of mobile payment infrastructure, merchant acceptance, and network coverage (Leong et al., 2020). The research emphasised the significance of creating an environment that is favourable and has a sufficient infrastructure to allow the widespread use of digital wallets. When it comes to paying for things online, digital wallets are quite practical and provide a number of benefits. The desire to utilise digital wallets is directly and immediately positively impacted by these enablers. As a result, we suggest the following theory. H4

H4. Facilitating conditions for Chinese residents to use digital wallets has a significant positive effect on behavioural intentions.

Hedonism is a psychological notion associated with the pursuit of pleasure, entertainment, and pleasurable sentiments. The UTAUT model that incorporates hedonic motivation has been significantly improved by Venkatesh's UTAUT2 model (Venkatesh et al. 2012). The UTAUT2 model, which builds on the original UTAUT model, incorporates hedonic motivation, which is a significant element affecting technological adoption and usage. The hedonic motivational structure is described as a component affecting users' behavioural intentions to utilise technology. Fagan introduced hedonic motivation as an external variable for investigation in the UTAUT model (Fagan, 2019). According to the motivation theory, both internal and external variables impact people's behaviour (Venkatesh et al., 2003). Customers' propensity to use mobile payment systems like digital wallets was studied by Chen et al. (2014).

They found that customers' acceptance and utilisation of mobile payment services were significantly impacted by hedonic incentives, such as pleasure and perceived enjoyment (Chen et al., 2014). Pleasure was shown to be a moderator between how simple something is to use and whether people plan to utilise it. Customers' propensity to use digital wallets in the context of mobile commerce was studied by Winarno et al. (Winarno et al., 2021). They found that consumers' willingness to utilise digital wallets was significantly affected by hedonic incentives, such as perceived delight and perceived playfulness. Consumers' levels of perceived happiness were shown to be a significant predictor of their intent to accept a new product or service. As a result, we propose the following: H5.

H5 Chinese residents have a significant positive influence on their willingness to use digital wallets due to the conditions of Hedonistic motivation

In 1960, Bauer, a Harvard University professor, introduced the idea of perceived risk from psychological theory and applied it to studies of consumer behaviour. He made the case that perceived risk may affect consumers' buying habits. Cunningham (1967) makes the case that perceived risk is the consumer's view of the possibility of something causing a risk occurring and the danger of the result if the risk happens. He bases this argument on two essential variables, uncertainty and the severity of the consequences. Chiu and Wang analyse the use of Web technologies by including perceived risk factors in the UTAUT model and come to the conclusion that use behaviour is inversely influenced by perceived risk. Despite the existence of cutting-edge technology and a supported infrastructure (Shaw, 2014), building trust is an essential component of electronic transactions (Chiu & Wang, 2008). In order to make a purchase, customers need to know that their financial and personal data will be secure and that any transactions will be resolved in a timely manner (Shaw, 2014). According to our study (Chawla & Joshi, 2017) (Chawla & Joshi, 2019), consumers' propensity to utilise is correlated with their willingness to incur risks. Consequently, we suggest the following: H6.

H6 Chinese residents have a significant positive effect on their willingness to use digital wallets in terms of perceived risk.

Users' access to resources and support is a major factor in how people utilise technology, as was found by the researchers who developed the UTAUT model (Venkatesh et al., 2003). The availability of infrastructure, technical assistance, and training, as well as their favourable influence on user motivation to use technology, are emphasised. This includes the use of electronic wallets. Service quality, system reliability, and infrastructure support all have a favourable influence on user behaviour in regards to the adoption and actual usage of mobile data services, according to studies on the topic (Patil et al., 2020; Morosan & DeFranco, 2016). Currently available information on digital wallets does not indicate this, however. Therefore, we propose the following: H7.

H7 Chinese residents have a significant positive influence on the Facilitating for using digital wallets through their behaviour.

The UTAUT model was introduced by Venkatesh et al. (2003), who also emphasised the significance of behavioural intentions as a significant predictor of technology use behaviour. The user's purpose influences their actions significantly. Chao looked at what makes people want to utilise mobile payment systems like digital wallets and what discourages them from doing so (Chao, 2019). Customers' actual use of digital wallet services was shown to be significantly influenced by customers' behavioural aims, which were affected by aspects including performance expectations, effort expectations, social influence, and enabling conditions. Therefore, we recommend the following: H8

H8 Chinese residents' behavioural intention to use digital wallets has a significant positive impact on usage behaviour.

A Unified Theory of Acceptance and Use of Technology (UTAUT) model was developed by Venkatesh et al., (2003), however the four moderators in the UTAUT model—gender, age, experience, and voluntariness of use—were not discussed explicitly. We modified these five variables according to age, gender, income, education, type of digital wallet usage, and monthly expenditure. For students, we suggest the following variable hypotheses under these conditions, using an alternative validation model in which schooling stands in for prior experience. Based on these analyses, we developed the following research hypotheses for this study:  
H9a: The effect of performance expectations on willingness to use is moderated by gender.

H9b: The effect of effort expectation on intention to use is moderated by gender.  
H9c: The effect of community influence on intention to use is moderated by gender.  
H10a: The effect of performance expectations on intention to use is moderated by the age.  
H10b: The effect of effort expectation on intention to use is moderated by age.  
H10c: The effect of social impact on intention to use is moderated by the age.

H10d: The effect of facilitation conditions on use behaviour is moderated by the age.  
H11a: The effect of effort expectancy on intention to use is moderated by educational level.

H11b: The effect of social impact on intention to use is moderated by educational level.

H11c: The effect of facilitation conditions on use behaviour is moderated by educational level.

## **4. Data collection**

### **4.1 instrument**

The questionnaire in this paper was translated from English into Chinese and compared with the original version to ensure accuracy. It enabled the researcher to make sure the replies weren't unclear and that the relationships between the elements were sufficient (Kamdjoug et al., 2021). Thirty people were polled for their opinions on the questionnaire's phrasing after content validation recommendations were made. Based on their comments, the questionnaire was finalised and sent to the 450 digital wallet-using Chinese residents. The link included an incentive to draw three lucky users to give away a gift.

### **4.2 Data collection methods**

The questionnaire has been published in May 2023, closing at 23:59 BST on May 31, by means of an online questionnaire. The most popular questionnaire in China is the Questionnaire Star, and we have checked the suitability of the questionnaires received and eliminated any abnormalities.

We took the following steps to assure the consistency of the questionnaire data survey. Firstly, we uniquely numbered each questionnaire to ensure that the questionnaire would not be filled out by duplicates, which would have an impact on the analysis's findings. Secondly, the importance of questionnaire participation was clarified. Thirdly, we used robust data privacy management features, and all questionnaires were anonymized. Finally, we received 425 questionnaires, of which 20

questionnaires did not meet the survey requirements, and finally, 405 questionnaires (n=405) were reconsidered for the final data analysis.

For model assessment, we utilised SPSS 26.0 programme to evaluate the study hypotheses. The model was evaluated for reliability, correlation, validity, factor analysis, regression analysis, and lastly path analysis. In light of this, the data analysis and discussion in this paper focus on both the central dimensions and moderating aspects of UTAUT.

### 4.3 Data collection questionnaire construction

The first section of the questionnaire is a demographic survey that asks respondents questions about their gender, age, level of education, household income, employment, and the primary ways in which they put their digital wallet to use. The second part of the questionnaire is the UTAUT model questionnaire. This questionnaire is based on the 7 factors of the latest UTAUT model; each factor involves three questions and is divided into levels one to five according to the level of satisfaction, with level five being very satisfied and level one being very dissatisfied. It is used to investigate the factors influencing the current level of satisfaction with the use of digital wallets by Chinese residents. The two-part questionnaire was designed with a total of 30 questions, resulting in a minimum valid questionnaire of 135.

Demographics	Category	Returned samples	Percent (%)
Gender	male		
	Female		
Age	18-25		
	26-39		
	40-59		
	Above 60		
Education level	Less than a bachelor's degree		
	Bachelor's degree		
	above bachelor's degree		
Occupation	Student		
	Working		
	Unemployed		
Types of digital wallets	Ali Digital Wallet		
	WeChat Digital Wallet		
	Other		
Monthly spending on digital wallets (RMB)	0-2000		
	2001-4000		
	4001-6000		

	Above6001		
--	-----------	--	--

Table 1. Questionnaire data collection

Model independent and dependent variables	No.	Questions	Theoretical literature
Performance Expectations (PE)	PE1	Using a digital wallet will help me complete financial transactions faster.	(Venkatesh & Davis 2003)
	PE2	Using a digital wallet can track my financial transactions more easily.	
	PE3	Using a digital wallet will reduce the amount of time I spend on financial transactions	
Effort Expectation (EE)	EE1	Using a digital wallet is easy	(Venkatesh & Davis 2003)
	EE2	The design of the digital wallet interface is visually appealing	
	EE3	Digital wallets with useful and clear instructions	
Social Impact (SI)	SI1	My family and friends would approve of me using a digital wallet	(Venkatesh & Davis 2003)
	SI2	My family and friends will use digital wallets for financial transactions	
	SI3	My family and friends have a positive view of digital wallets	
Facilitating condition (FC)	FC1	I can use the technology needed to use my digital wallet	(Venkatesh & Davis 2003)
	FC2	I have the skills to use a digital wallet	
	FC3	I have the resources I need to use my digital wallet	
Behavioral Intentions (BI)	BI1	I intend to use a digital wallet in the next six months	(Venkatesh & Davis 2003)
	BI2	I hope to use my digital wallet regularly over the next half a year.	
	BI3	I hope to continue using my digital wallet in a long time.	
Hedonic Motivation (HM)	PC1	I am relaxed and happy when using my digital wallet	(Soodan & Rana 2020)
	PC2	I'm using a digital wallet to trade to make me feel happy	
	PC3	I am looking forward to trading with my digital wallet	

PerceivedRisk (PR)	PR1	I am confident that the security associated with the use of digital wallets will not result in the disclosure of personal information, theft of payment passwords or leakage of transaction data.	(Davis 1989)(Kapoor et al.,2022) (Chawla&Joshi, 2019), (Williams,2021)
	PR2	I believe that using a digital wallet for online payments does not lead to the risk of loss of funds, such as double chargebacks, failed transactions, etc.	
	PR3	I would be more likely to use a digital wallet if it offered additional security features	
UseBehavioral (UB)	UB1	I am currently very happy with my digital wallet	(Venkatesh & Davis 2003)
	UB2	I am currently using my digital wallet quite frequently	
	UB3	I will be more active in using digital wallets in the future	

Chart 1. UTAUT model questionnaire design

## 5. Data analysis

The data was analysed in two steps (Anderson and Gerbing, 1988). (Matzo, 2013), The data were first analysed using descriptive analysis, after which the reliability of the data from the questionnaire was tested using empirical methods.

### 5.1 Statistical analysis of the sample

A total of 428 questionnaires were collected in this study, 405 of which were usable. 405 questionnaires were collected through online questionnaires, with an effective rate of 94.6% meeting the experimental criteria. In this study, 44.4% of the sample were female and 55.6% were male. In terms of age, most respondents were relatively young, with over half of them 51.9% being in the 26-39 age group.

Understandably, workers were the most occupation of the respondents at 70.1%, followed by students at 24.2%. In terms of education, the majority were concentrated in undergraduate degrees, at 62.2%. In terms of digital wallets WeChat digital wallets accounted for 57.3%. In terms of monthly spending, our majority of people are concentrated in the 4001-6000 bracket, accounting for 44.7%.

Table 2 Descriptive statistics

Topic setting	Option	Frequency	Percentage
sex	Male	225	55.6
	Female	180	44.4
Age	18-25	98	24.2
	26-39	210	51.9

	40-59	64	15.8
	Above60	33	8.1
Levelofeducation	Nomorethanabachelor'sdegreeis required.	86	21.2
	Bachelor'sdegree,collegedegree	252	62.2
	Bachelor'sdegreeorabove	67	16.5
Position	Student	98	24.2
	Worker	284	70.1
	Unemployment	23	5.7
Typesofdigitalwalletuse	WeChatDigitalWallet	232	57.3
	AlipayDigitalWallet	142	35.1
	Other	31	7.7
Monthlispensingondigital wallets (RMB)	0-2000	98	24.2
	2022-4000	98	24.2
	4001-6000	181	44.7
	Above6000	28	6.9

## 5.2 Reliabilityanalysis

The reliability of the questionnaire may be evaluated to see whether the results show a noticeable degree of consistency, stability, and dependability. The reliability of data collection and the robustness of the questionnaire design are the main factors affecting a study's dependability. Questionnaires may be evaluated using several methods, but in research, the Cronbach's Alpha coefficient is often used to assess their validity. The magnitude of the coefficient is proportional to the overall reliability and consistency of the questionnaire. Reliability test results are deemed adequate when the Cronbach's Alpha score falls within the range of 0.7 to 0.8. The reliability test results may be rated good if the value is between 0.8 and 0.9. Additionally, the reliability test results may be described as extremely excellent if the value is greater than 0.9. The results of a reliability study using the questionnaire data that were loaded into SPSS 26.0 are as follows:

Table 3 Reliability analysis

Dimension	Cronbach's Alpha	No of Items
Entirety	0.909	24
PE	0.882	3
EE	0.876	3
SI	0.867	3
FC	0.870	3
BI	0.887	3
HM	0.871	3
PR	0.863	3
UB	0.894	3

All dimensions within the current dataset exhibited a Cronbach's Alpha value above 0.8, while the dataset as a whole demonstrated a Cronbach's Alpha value of 0.909. These findings indicate that the questionnaire used in the study exhibited high levels

of internal consistency and reliability, hence affirming the suitability of the collected data for further research purposes.

### 5.3 Validity analysis (including factor analysis)

A measuring instrument's ability to properly measure what it is meant to measure is tested via a validity analysis, which also works to assure the instrument's accuracy and validity. In this research, validity analysis was carried out by thoroughly assessing the questionnaire's content validity and structural validity.

Exploratory factor analysis is used in this research to evaluate the questionnaire's structural validity. Before commencing factor analysis, it is possible to check whether or not the data pass the KMO and Bartlett's sphericity tests. The use of factor analysis is appropriate when the KMO score is greater than 0.5. When it is more than 0.6 and less than 0.7, it has fair validity; when it is larger than 0.7 and more than 0.8, it has good validity; and when it is greater than 0.8, it has high validity. Additionally, factor analysis is often performed when the Bartlett's sphericity test's p-value is less than 0.01, indicating the possibility of common components within correlation matrices. The component analysis methodology is used in this article because it is the most common and simple method for determining structural validity, according to British psychologist C.E. Spielman. Using SPSS 26, he examined the data.

Table.4 [Result of data statistics](#)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.862
Bartlett's Test of Sphericity	Approx. Chi-Square	5956.337
	df	276
	Sig.	.000

The experimental scales in this study are derived from mature scales that have been used and validated numerous times in previous studies, and the scientific validity of the dimensions and questions of these scales has been verified numerous times in domestic marketing science research, making them both relevant to the current situation in China and to the needs of the field. The second test was to ensure the questionnaire was well-designed, and it passed with a KMO of 0.862 and a sig of 0.00 < 0.01. This demonstrated that factor analysis could be used to the questionnaire data.

The following table was created by extracting the common components during factor analysis using the principal component analysis method:

Table.5 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.905	32.939	32.939	7.905	32.939	32.939	2.482	10.340	10.340
2	2.115	8.813	41.752	2.115	8.813	41.752	2.453	10.221	20.561

3	1.86	7.760	49.512	1.86	7.760	49.512	2.44	10.185	30.746
	2			2			4		
4	1.77	7.398	56.910	1.77	7.398	56.910	2.43	10.136	40.882
	5			5			3		
5	1.71	7.136	64.045	1.71	7.136	64.045	2.43	10.127	51.009
	3			3			0		
6	1.49	6.224	70.269	1.49	6.224	70.269	2.42	10.112	61.121
	4			4			7		
7	1.40	5.842	76.111	1.40	5.842	76.111	2.39	9.991	71.112
	2			2			8		
8	1.10	4.613	80.724	1.10	4.613	80.724	2.30	9.612	80.724
	7			7			7		
9	.447	1.864	82.588						
10	.392	1.635	84.223						
11	.385	1.603	85.826						
12	.369	1.537	87.363						
13	.337	1.406	88.768						
14	.334	1.390	90.158						
15	.301	1.253	91.412						
16	.289	1.206	92.617						
17	.272	1.135	93.752						
18	.258	1.075	94.826						
19	.239	.998	95.824						
20	.225	.937	96.762						
21	.217	.905	97.666						
22	.204	.851	98.517						
23	.182	.757	99.274						
24	.174	.726	100.000						

---

ExtractionMethod:PrincipalComponentAnalysis.

It may be argued that these 8 common factors more accurately reflect all components as they account for a total of 80.724% of the variance, as seen in the table above, where a total of 8 common factors with the eigenvalues larger than 1 were retrieved.

Additionally, the crushed stone test is often used to establish the number of components in a factor analysis based on the crushed stone plot.

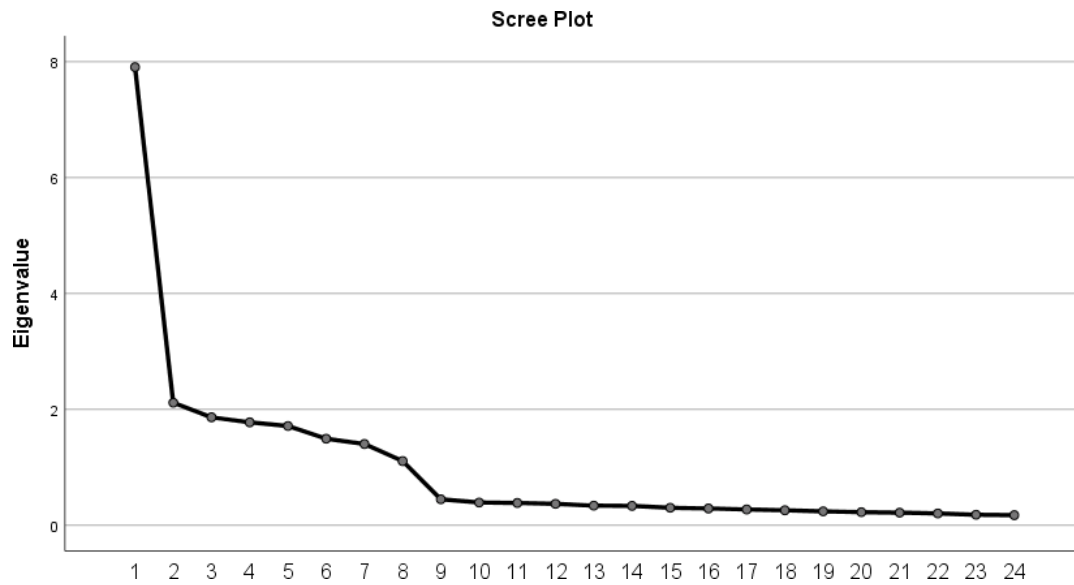


Figure 3 Gravelmap

From the above gravel plot, it can be seen that the eigenvalue of the 9th factor is less than 1 and the slope becomes slower, indicating that the extraction of 8 factors is appropriate. In order to be able to better compare the factor loading status of each indicator, factor loading analysis was carried out by the maximum variance method to interpret the common factors and obtain the rotated factor component matrix in the table below, in which options with absolute values less than 0.6 were excluded.

Table 6 Rotated Component Matrix

	Component							
	1	2	3	4	5	6	7	8
PE1	.876							
PE2	.868							
PE3	.844							
EE1					.828			
EE2					.831			
EE3					.841			
SI1						.817		
SI2						.871		
SI3						.851		
FC1				.840				
FC2				.839				
FC3				.860				
BI1		.825						
BI2		.854						
BI3		.857						
HM1			.830					
HM2			.857					
HM3			.885					

PR1	.849	
PR2	.850	
PR3	.852	
UB1		.778
UB2		.805
UB3		.810

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

The eight extracted common components are obviously consistent with the eight dimensions mentioned in this study, as seen by the rotated component matrix. In summary, the findings of this optimised questionnaire data have excellent validity and pass the validity test.

#### 5.4 Correlation analysis

A statistical measure of how closely two variables are associated linearly—that is, how much they fluctuate in lockstep with one another—is called correlation. It is a common way for presenting simple links without directly defining cause and effect. As a result, correlation analysis is done for the following indicators in this research. Regression analysis requires correlation analysis as a precursor since it shows how closely related the variables are to one another and, in some ways, tests the validity of the model by looking at whether two variables are correlated. The Pearson coefficient is often used in correlation analysis, and the correlation coefficient is denoted by the letter *r*. When the correlation coefficient (*r*) equals 0, it indicates the absence of a linear association between the variables. A weak correlation is seen when the magnitude of the correlation coefficient (*r*) falls within the range of 0 to 0.3, but a statistically significant link is present when the magnitude of *r* ranges from 0.3 to 0.5. A strong correlation is seen when the magnitude of the correlation coefficient, denoted as *r*, falls within the range of 0.5 to 1.

Table 7 Correlation analysis

	PE	EE	SI	FC	BI	HM	PR	UB
PE	1							
EE	.246**	1						
SI	.296**	.336**	1					
FC	.237**	.389**	.248**	1				
BI	.279**	.356**	.333**	.334**	1			
HM	.295**	.285**	.234**	.231**	.310**	1		
PR	.236**	.295**	.264**	.297**	.352**	.185**	1	
UB	.424**	.498**	.416**	.412**	.419**	.383**	.348**	1

In the correlation analysis, when the significance of two variables is less than 0.05, it means that they are significantly correlated; if the significance is more than 0.05, there is no meaningful relationship between them. Therefore, according to the above table, all the above eight dimensions are significantly correlated with each other.

#### 5.5 Regression analysis

A dependent variable's (explanatory variable's) statistical relationship to one or more independent variables (explanatory variables) is the focus of regression analysis. Once a link between the variables has been established, a linear regression equation may be made to further explore the cause-and-effect relationship.

PE, EE, SI, FC, PC, and PR show a substantial correlate with UB, according to the correlation study. Therefore, the following hierarchical linear regression analysis is performed using UB as the dependent variable, PE, EE, SI, FC, PC, and PR as the independent variables, age, gender, and education as the control factors, and BI as the mediating variable, in that sequence.

*Table 8 Table of regression coefficients*

	Model 1		Model 2		Model 3	
	$\beta$	p	$\beta$	p	$\beta$	p
(Constant)	3.751	0.000	-0.184	0.526	-0.162	0.572
sex	-0.206	0.033	-0.093	0.207	-0.101	0.169
age	0.064	0.259	0.021	0.620	0.013	0.759
Academic degree	-0.030	0.701	-0.063	0.289	-0.059	0.322
PE			0.200	0.000	0.191	0.000
EE			0.274	0.000	0.258	0.000
SI			0.174	0.000	0.157	0.000
FC			0.155	0.000	0.141	0.001
HM			0.171	0.000	0.153	0.001
PR			0.104	0.008	0.083	0.037
BI					0.101	0.014
RSquare		0.014		0.448		0.456
F		1.947		35.618		33.075

The R-squared in the table is the coefficient of determination, as can be shown based on the pertinent data in the aforementioned table. According to the table, the R-squared for model 2 is 0.448, meaning the regression model accounts for 44.8% of the variance of the dependent variable; for model 3, the R-squared is 0.456, meaning the regression model accounts for 45.6% of the variance of the dependent variable. The existence of the mediating impact of BI is shown by the change in the R-squared of 0.008.

The significance of the variables PE, EE, SI, FC, PC, and PR was revealed to be 0.000, 0.000, 0.000, 0.000, 0.000, and 0.008 respectively, all of which were less than 0.05, and their regression coefficients were 0.200, 0.274, 0.174, 0.155, 0.171, and 0.104 respectively after a thorough analysis of the regression analysis results of model 2. According to the regression coefficients of 0.200, 0.274, 0.174, 0.155, 0.171, and 0.104, respectively, UB was significantly positively correlated with PE, EE, SI, FC, PC, and PR. After taking into account BI, the regression analysis of model 3's data indicates that the corresponding coefficient is 0.101 (higher than 0), and the significance is less than 0.05, indicating that the mediating effect is still there.

#### 6.6 Tests of the mediating effect

In order to further investigate the importance of the mediation effect, 95% confidence intervals were generated using the Bootstrap approach. The Preacher and Hayes (2008) technique was utilised to evaluate the Bootstrap sample, and Model 4 in SPSS Process v.

4.1 was employed to test for a mediating role of BI. The results are presented in the table below.

*Table 9 Intermediary pathway analysis table*

Path	Effect	se	t	p	LLCI	ULCI
PE->BI->UB	0.3283	0.0435	7.5476	0.0000	0.2428	0.4138
EE->BI->UB	0.4344	0.048	9.0514	0.0000	0.3401	0.5288
SI->BI->UB	0.3312	0.0485	6.8314	0.0000	0.2359	0.4266
FC->BI->UB	0.3035	0.0451	6.7223	0.0000	0.2147	0.3922
HM->BI->UB	0.3101	0.0504	6.1559	0.0000	0.2111	0.4091
PR->BI->UB	0.2172	0.0446	4.8652	0.0000	0.1294	0.305

The indirect effect of PE after BI on UB was 0.3283 with a 95% confidence interval of [0.2428, 0.4138] This interval did not pass through 0, demonstrating the presence of a mediating effect; the indirect effect of EE after BI on UB was 0.4344 with a 95% confidence interval of [0.3401, 0.5288] This interval did not pass through 0, demonstrating the presence of a mediating effect; SI The indirect effect of BI on UB was 0.3312 with a 95% confidence interval of [0.2359, 0.4266] which did not pass through 0, demonstrating the presence of a mediating effect; the indirect effect of FC on UB after BI was 0.3035 with a 95% confidence interval of [0.2147, 0.3922] which did not pass through 0, demonstrating the presence of a mediating effect; the indirect effect of P C after The indirect effect of BI on UB was 0.3101 with a 95% confidence interval of [0.2111, 0.4091] This interval did not pass through 0, demonstrating the presence of a mediating effect; the indirect effect of PR on UB after BI was 0.2172 with a 95% confidence interval of [0.1294, 0.305] This interval did not pass through 0, demonstrating the presence of a mediating effect.

## 5.6 Testing for moderating effects

*Table 10 the testing for moderating effects*

Assumptions	b	t	p	Hypothesis validation
H9a	0.133	0.0***	4.142	Valid
H9b	0.223	0.0***	4.128	Valid
H9c	0.152	0.0***	3.334	Valid
H10a	0.331	0.174	2.223	Invalid
H10b	-0.332	0.332	-1.742	Invalid
H10c	0.345	0.352	3.121	Invalid
H10d	0.120	0.0***	1.334	Valid
H11a	-0.228	0.353	-0.227	Invalid
H11b	-0.303	0.442	-0.676	Invalid
H11c	-0.343	0.0545	-0.358	Invalid

Note: \*\* denotes  $P < 0.001$ , \* denotes  $P < 0.01$ , \* denotes  $P < 0.05$ .

The three independent variables of gender, age, and education influenced the intention to use, and the significance (P) and regression coefficient (B) for each independent variable and the dependent variable were calculated. The regression coefficients were examined to see if there was a significant moderating influence (P 0.05), and the significance indicates that the independent factors have a beneficial moderating impact on use behaviour (Table 9). All three of the H9 hypotheses are correct. The hypothesis

H10 distrust regarding the effect of age on how users perceive facilitation situations and use behaviour. Alternative hypotheses are false.

## 6 Discussions

In this research, the variables, and attitudes of users regarding the usage of digital wallets were examined using the UTAUT model. As the empirical aspect of this study used a questionnaire to collect information, followed by a variety of validation methods to test and analyse the data to better explain the underlying factors of digital wallet usage. Several methods, including factor analysis and regression analysis, were used to get the findings of these research. Additionally, to more clearly illustrate how using the UTAUT model has affected the adoption of digital wallets, we also employed moderating factors. We discuss the results in the current context by using current information on the use of digital wallets.

Notably, the experiment introduces two factors, perceived entertainment (HM) and perceived risk (PR), in addition to the original four factors (PE, EE, FI, FC) to validate the digital wallet interaction. We strongly find that H1-H8 all satisfy the condition of positive correlation. In the perceived risk (H6) condition we find that the better the security of the digital wallet, the higher the attitude and enthusiasm of the users to use it. In the perceived entertainment (H7) we find that consumers will perceive entertainment and cheerfulness when using digital wallets. Usage On the UTAUT model's bars, the three moderating elements of age, gender, and education were also presupposed. Based on the UTAUT diagram, the UTAUT model is further examined in terms of its moderating factors.

Where hypotheses H1-H8 all satisfy the positive correlation condition. The 10 hypotheses in the re-variance moderation validation, of which H9a, H9b, H9c and H10 are verified to satisfy the validation moderation. where the higher the security factor of the digital wallet, the more willing consumers are to use it

### 6.1 Theoretical contribution

This study expands on the literature on digital wallets using digital wallets. Firstly, in the literature review section, through the extensive literature reading and the targeted analysis of the research topic, the corresponding keywords were extracted, and the research object and research questions were focused on the digital wallet and UTAUT model. The research review focuses on digital wallets and the UTAUT model, research on the influence of digital wallets and "research on the willingness of users to use digital wallets. Secondly, the theoretical application section combines the research review with existing research, applying UTAUT theory, perceived risk theory and perceived entertainment to the research, designing the questionnaire dimensions and conducting the questionnaire survey. Finally, the model building section. Based on the results of the survey, a model of the factors influencing digital wallet users' willingness to use was constructed and a survey scale was designed for future reference

In conclusion, this study's primary goals are two. Based on data from Chinese individuals, it was shown in (1) whether UTAUT factors may increase the desire to use a digital wallet and (2) how moderating variables affect the intention to use UTAUT factors. This experiment demonstrated that e-wallet usage intention was significantly correlated with performance expectation (H1), effort expectation (H2),

social influence (H3), social impact (H4), facilitation conditions (H5), behavioural intention (H6), hedonic motivation (H7), and perceived risk (H8). Additionally, a second research purpose serves as a vital theoretical foundation in the moderating function. The moderating elements of gender (H9a) (H9b) (H9c), which were established, were observed to have a bigger impact than the facilitation conditions on intention to use (H10d), which were established by the influence of age. Based on these empirical and quantitative findings, we make the following substantial theoretical additions to the literature on the usage of digital wallets.

First, by studying the context of digital wallet deployment, the study adds to the body of existing research on digital wallets. Intentions to use digital wallets are influenced by performance expectations (H1), effort expectations (H2), social influence (H3), social impact (H4), facilitation conditions (H5), behavioural intentions (H6), hedonic motivation (H7), and perceived risks (H8). For instance, many academics have also investigated the relationship between acknowledging digital wallets and performance expectation (H1), effort expectation (H2), social influence (H3), social impact (H4), facilitation conditions (H5), behavioural intention (H6), hedonic motivation (H7), and perceived risk (H8). My research also contributes to a deeper understanding of how digital wallets are used.

For instance, in China, our study's findings are in line with those of Liu et al.'s (2021) study, which extended the TAM model for empirical evidence and demonstrated that effort expectation (H2), social influence (H3), and social impact (H4) are significant influencing factors, as well as that hedonic motivation is a significant influencer on the adoption of digital wallets (Liu et al., 2021).

Furthermore, this research offers a theoretical addition to the UTAUT digital model. Through their research, researchers have urged the development of a model beyond UTAUT and a more thorough framework's basis (Leong et al., 2022) (Liu et al., 2019) (Ramli and Hamzah, 2021). Based on the theoretical foundations, this study incorporates perceived risk and hedonic motivation into the UTAUT model while conceptually investigating the moderators. The four moderators' four distinct interaction effect orientations add to this research in various ways.

Through the promotional features provided by digital wallets, we can explain hedonic motivation, social expectations and performance expectations (all with significant effects), which we get to show positive effects with the propensity to use to attract consumers to continue using digital wallets. When users use the e-wallet, we can provide coupons, points and a series of activities based on the provision of coupons, points and so on, the accumulation of rewards and points and thus exchanged for valuable physical goods, thus provoking consumers to continue to use the digital wallet for consumption, and the coupons obtained will also be saved in the digital wallet. As is the case with current mainstream e-wallet applications, digital wallets collaborate with other providers, thereby promoting a mutually beneficial situation (Wonget al., 2022).

The impact is significant from the perspective of perceived risk, with users seeking to engage in digital wallet use at low risk, with the main issues centred on privacy concerns. According to Kar (2020), individuals are more likely to have a positive

e-wallet use experience when the associated risk is less. In the context of route analysis, it is evident that the relationship between perceived risk and behavioural predisposition to use behaviours is quite significant. The issue of customer privacy is ensured through privacy authorisation and other means, thus promoting continued consumption and usage.

In terms of favourable conditions and effort expectations (significant impact), it is elaborated that the acceptance of users and merchants to use e-wallets is higher. The development of digital wallets is faster and digital wallets are less selective in China, where the two main streams are WeChat e-wallet and Alipay e-wallet (Krishnan, 2019; Sen, 2019.) Merchants are highly matched with the use of digital wallets. From the user's perspective, users are highly motivated to use e-wallets, thus creating favourable conditions and effort expectations as important conditions influencing the implementation of digital wallets in China.

This study is a test of the UTAUT model framework, further extending the UTAUT model to add knowledge about technology adoption, and the study shows how UTAUT provides a theoretical perspective as a powerful framework for monitoring the implementation of new technologies to influence the use of digital wallets. While several studies have explored the factors influencing digital wallet use, and the attitudes of residents towards using digital wallets. But few have integrated the UTAUT model into studies to analyse it, and few have used moderators to conduct moderator analyses of digital wallet usage models. This study supports the importance of UTAUT, as well as other factors considered in the study, as individuals consider moving from entrenched legacy systems to emerging technologies, such as digital wallet services.

## **6.2 Practical contribution**

The findings of this study have implied that ramifications for the numerous parties involved in the construction of digital wallets, for enhancing the functionality of digital wallets, and for boosting the use of these wallets. For users, they can gain some practical knowledge when using digital wallets. For businesses it will provide valuable insights for improvement, and they will also consider the ease of use, security, and other aspects of digital wallets. For academics it will give them a practical article to improve and learn from at a later stage.

A survey study of Chinese residents on digital wallets will provide relevant policymakers and business practitioners with an empirical basis on the promotion and facilitation of digital payments. Understanding the adoption and usage behaviour of Chinese residents towards digital wallets can help develop relevant policy measures and business strategies to facilitate the further development and growth of mobile wallet systems.

The findings imply that Chinese digital wallet developers may try to enhance features like simple payments and practical mobile payment choices to promote favourable attitudes and behavioural intentions. These findings demonstrate how trust influences our conduct in a favourable way towards mobile payment apps. This might be used by developers to provide comparable communication metrics as a fundamental marketing

communication approach. In order to establish trust, Batra and Keller (2016) propose a comprehensive technique that emphasises the interconnection between consumers and communication within a shared environment. Importantly, the findings provide a clear framework that demonstrates how various UTAUT variables affect behavioural intent and mobile payment use, allowing developers to create effective marketing plans for increased acceptance and use. It is becoming easier to match customer expectations with messaging as analytics develops. Consequently, comparable techniques may be used to increase consumer confidence in marketing messages concerning mobile payment incentives.

Overcoming the obstacles to implementing digital transformation effectively is another practical consequence. Although many businesses declare that their strategy objective is to immerse themselves more in the digital environment, execution often fails (Correani et al., 2020). The first step in the process of digital transformation is the adoption of a digital wallet at an appropriate time. This facilitates the integration of new technology into the internal teams and processes of businesses, as highlighted by Appio et al. (2021).

### **6.3 Limitations**

This paper has two main limitations. This study's primary technique of data gathering is a questionnaire survey, which is sensitive to subjective bias. The sample of questionnaires cannot replace the consumption behaviour and habits of all people. In future research, the sample needs to be further expanded and the findings cross-checked using a variety of methods, such as questionnaires combined with interviews and observations. In addition to this, in the analysis of moderating variables, gender, age and education were introduced. The sample size restriction necessitates additional verification of the findings of the investigation of moderating effects' generalizability.

### **6.4 Implication**

Based on this paper, I will make the following recommendations based on different roles. Our research provides empirical insights into the factors that impact the adoption of digital wallets across digital wallet vendors. By identifying the key determinants of intention to use, providers can tailor their marketing strategies and user experiences to align with user preferences and motivations. For instance, understanding the importance of perceived security and trust can guide providers to implement robust security measures and communicate these effectively to potential users. Furthermore, insights from our study can aid in the development of user-friendly interfaces, seamless transaction processes, and value-added features that enhance the overall user experience. As a result, digital wallet providers can expect increased adoption rates and customer satisfaction, fostering long-term brand loyalty.

Our findings hold significant implications for policymakers aiming to promote financial inclusion and modernize the banking sector in areas with limited access to formal banking services. The research highlights the role of digital wallets in bridging gaps in financial services and offers recommendations for fostering adoption among underserved populations. Policymakers can use this information to design targeted initiatives that encourage the adoption of digital wallets, ultimately promoting

financial literacy and inclusion among marginalized communities. Additionally, by addressing concerns related to security, trust, and compatibility, policymakers can create an enabling environment that boosts the adoption of digital wallet technologies.

On a broader societal level, our study's implications are considerable. Increased adoption of digital wallets can lead to a more efficient and streamlined economy. With reduced reliance on cash transactions, businesses and consumers can benefit from faster, more secure, and traceable transactions. This transition aligns with China's ambitions to become a cashless society, promoting convenience and reducing the risks associated with cash handling. Additionally, the proliferation of digital wallets presents opportunities for innovation and potential integration with other technologies, such as e-commerce and the Internet of Things (IoT), which might improve people's overall quality of life in Chinese society.

From an economic standpoint, the increased adoption of digital wallets can drive economic growth. As more transactions shift to digital platforms, businesses can streamline their operations and reduce overhead costs associated with cash handling. Additionally, the data created by digital wallet transactions may give insightful knowledge on the behaviour and preferences of consumers, allowing firms to improve their marketing approaches and product lines. A more effective distribution of resources within the economy is a result of this.

## **7 Conclusion**

This comprehensive understanding of the factors influencing the intention to use digital wallets is the result of combining several analytical techniques, including combined confidence analysis, factor analysis, correlation analysis, regression analysis, moderators examining the relationships between UTAUT antecedents and intention to use, and relative weight analysis. The findings of this methodology indicate that a limited set of factors may account for a significant amount of the likelihood of a prospective user adopting a digital wallet. Additionally, the data analysis revealed that the findings exhibited strong consistency across various contexts and areas within China. This suggests that the results obtained from one specific site may be reasonably extrapolated to other locations, reducing the need for an excessively detailed geographical approach.

In general, our study outcomes may provide valuable insights for individuals aiming to stimulate the demand for digital wallets and for scholars seeking a deeper comprehension of the factors influencing the adoption of digital wallets. Additionally, our results can serve as a basis for refining theoretical frameworks that might facilitate future empirical investigations in this domain. Significantly, the present research furthermore offers crucial and succinct recommendations for organisations and policymakers aiming to enhance involvement in the Chinese banking sector in locations where formal banking services are not fully used. The findings of this research have the potential to assist a larger population in enhancing the use of digital wallets, while also making a significant contribution towards the broader objective of promoting financial inclusion on a world-wide scale.

## References

- Ajzen, I. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Ajzen, I., & Fishbein, M. (1975). A Bayesian analysis of attribution processes. *Psychological Bulletin*, 82(2), 261.
- Al-Adwan, A. S., Al-Adwan, A., & Berger, H. (2018). Solving the mystery of mobile learning adoption in higher education. *International Journal of Mobile Communications*, 16(1), 24-49.  
<https://doi.org/10.1504/IJMC.2018.088271>
- Alalwan, A. A., Dwivedi, Y. K., Rana, N. P., & Williams, M. D. (2016). Consumer adoption of mobile banking in Jordan: Examining the role of usefulness, ease of use, perceived risk, and self-efficacy. *Journal of Enterprise Information Management*, 29(1), 118-139.  
<https://doi.org/10.1108/JEIM-04-2015-0035>
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411. <https://doi.org/10.1037/0033-2909.103.3.411>
- Aveni, T., & Roest, J. (2017). *China's Alipay and WeChat Pay: Reaching Rural Users*. World Bank, Washington, DC.  
<http://hdl.handle.net/10986/30112> License: CC BY 3.0 IGO.
- Batra, R., & Keller, K. L. (2016). Integrating marketing communications: New findings, new lessons, and new ideas. *Journal of Marketing*, 80(6), 122-145. <https://doi.org/10.1509/jm.15.0419>
- Botero, G. G., Nguyet, D. A., Botero, J. G., Zhu, C., & Questier, F. (2022). Aceptación y uso del aprendizaje de idiomas asistido por dispositivos móviles por parte de profesores de idiomas de educación superior. *Lenguaje*, 50(1), 66-93.  
<https://link.gale.com/apps/doc/A694388914/AONE?u=anon~3021c78d&sid=googleScholar&xid=77604739>
- Beck, T., Pamuk, H., Ramrattan, R., & Uras, B. R. (2018). Payment instruments, finance and development. *Journal of Development Economics*, 133, 162-186.
- Chawla, D., & Joshi, H. (2017). Consumer perspectives about mobile banking adoption in India – a cluster analysis. *International Journal of Bank Marketing*. <https://doi.org/10.1108/IJBM-03-2016-0037>
- Chawla, D., & Joshi, H. (2019). Consumer attitude and intention to adopt mobile wallet in India – An empirical study. *International Journal of Bank Marketing*. <https://doi.org/10.1108/IJBM-09-2018-0256>
- Cheong, J. H., & Park, M. C. (2005). Mobile internet acceptance in Korea. *Internet Research*, 15(2), 125-140.  
<https://doi.org/10.1108/10662240510590324>
- Chiu, C. M., & Wang, E. T. (2008). Understanding Web-based learning continuance intention: The role of subjective task value. *Information & Management*, 45(3), 194-201. <https://doi.org/10.1016/j.im.2008.02.003>

- Chao, C. M. (2019). Factors determining the behavioral intention to use mobile learning: An application and extension of the UTAUT model. *Frontiers in Psychology*, 10, 1652. <https://doi.org/10.3389/fpsyg.2019.01652>
- China Internet Network Information Center. (2021). The 47th Statistical Report on Internet Development in China. Retrieved from <http://www.cac.gov.cn/>
- Cunningham, M. S. (1967). The major dimensions of perceived risk. *Risk Taking and Information Handling in Consumer Behavior*.
- Dahlberg, T., Guo, J., & Ondrus, J. (2015). A critical review of mobile payment research. *Electronic Commerce Research and Applications*, 14(5), 265-284. <https://doi.org/10.1016/j.elerap.2015.07.006>
- Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13, 319-340. <https://doi.org/10.2307/249008>
- Detikcom. *Awas! Penjahat di Indonesia IncarDompot Digital*, 2019. Retrieved from <https://inet.detik.com/security/d-4740593/awas-penjahat-di-indonesia-incar-dompot-digital>
- Demirguc-Kunt, Asli, LeoraKlapper, DorotheSinger, SaniyaAnsar, and JakeHess. 2018. *The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution*. Washington, DC: World Bank.
- Do Nam Hung, J. T., Azam, S. F., & Khatibi, A. A. (2019). An empirical analysis of perceived transaction convenience, performance expectancy, effort expectancy, and behavior intention to mobile payment of Cambodian users. *International Journal of Marketing Studies*, 11(4), 77-90.
- Fagan, M. H. (2019). Factors influencing student acceptance of mobile learning in higher education. *Computers in the Schools*, 36(2), 105-121. <https://doi.org/10.1080/07380569.2019.1603051>
- George, A., & Sunny, P. (2021). Developing a research model for mobile wallet adoption and usage. *IIM Kozhikode Society & Management Review*, 10(1), 82-98. <https://doi.org/10.1177/2277975220965354>
- García Botero, G., Questier, F., Cincinnato, S., He, T., & Zhu, C. (2018). Acceptance and usage of mobile assisted language learning by higher education students. *Journal of Computing in Higher Education*, 30, 426-451. <https://doi.org/10.1007/s12528-018-9177-1>
- Hassan, M. A., Shukur, Z., & Hasan, M. K. (2021). Electronic wallet payment system in Malaysia. In *Data Analytics and Management: Proceedings of ICDAM* (pp. 711-736). Springer Singapore. [https://doi.org/10.1007/978-981-15-8335-3\\_55](https://doi.org/10.1007/978-981-15-8335-3_55)
- Hayashi, F., & Bradford, T. (2014). Mobile payments: Merchants' perspectives. *Economic Review*, 99(1), 5-30.
- Hsieh, P. J. (2021). Understanding medical consumers' intentions to switch from cash payment to medical mobile payment: A perspective of technology migration. *Technological Forecasting and Social Change*, 173, 121074. <https://doi.org/10.1016/j.techfore.2021.121074>
- Kapoor, A., Sindwani, R., & Goel, M. (2022). Assessing mobile banking service quality dimensions using multi-criteria decision making. In *Future of Work and Business in Covid-19 Era: Proceedings of IMC-2021* (pp. 131-147). Springer Nature Singapore. [https://doi.org/10.1007/978-981-19-0357-1\\_12](https://doi.org/10.1007/978-981-19-0357-1_12)
- Kamdjou, J. R. K., Wamba-Taguimdje, S. L., Wamba, S. F., & Kake, I. B. E. (2021). Determining factors and impacts of the intention to adopt mobile banking app in Cameroon: Case of SARA by Afriland First Bank. *Journal of Retailing and Consumer Services*, 61, 102509.

<https://doi.org/10.1016/j.jretconser.2021.102509>

Kim, J., Jin, B., & Swinney, J. L. (2009). The role of e-tail quality, e-satisfaction and e-trust in online loyalty development process. *Journal of Retailing and Consumer Services*, 16(4), 239-247.

<https://doi.org/10.1016/j.jretconser.2008.11.019>

Ku, E. C. (2021). Like a shadow: Enhancing transactions with mobile payment applications. *The International Review of Retail, Distribution and Consumer Research*, 31(5), 531-548.

<https://doi.org/10.1080/09593969.2021.2007978>

Krishnan, G. (2019). Is having too many E-wallets a problem? Retrieved from <https://www.imoney.my/articles/is-having-too-many-e-wallets-a-problem/>

Leong, L. Y., Hew, T. S., Ooi, K. B., & Wei, J. (2020). Predicting mobile wallet resistance: A two-staged structural equation modeling-artificial neural network approach. *International Journal of Information Management*, 51, 102047. <https://doi.org/10.1016/j.ijinfomgt.2019.102047>

Leong, L. Y., Hew, J. J., Wong, L. W., & Lin, B. (2022). The past and beyond of mobile payment research: A development of the mobile payment framework. *Internet Research*, 32(6), 1757-1782.

<https://doi.org/10.1108/INTR-06-2021-0348>

Liu, Z., Ben, S., & Zhang, R. (2019). Factors affecting consumers' mobile payment behavior: A meta-analysis. *Electronic Commerce Research*, 19(3), 575-601. <https://doi.org/10.1007/s10660-019-09349-4>

Liu, R., Wu, J., & Yu-Buck, G. F. (2021). The influence of mobile QR code payment on payment pleasure: Evidence from China. *International Journal of Bank Marketing*, 39(2), 337-356. <https://doi.org/10.1108/IJBM-11-2020-0574>

Martins, C., Oliveira, T., & Popovič, A. (2014). Understanding the internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. *International Journal of Information Management*, 34(1), 1-13. <https://doi.org/10.1016/j.ijinfomgt.2013.06.002>

Matemba, E. D., Li, G., & Maiseli, B. J. (2018). Consumers' stickiness to mobile payment applications: An empirical study of WeChat wallet. *Journal of Database Management (JDM)*, 29(3), 43-66.

Morris, M. G., & Venkatesh, V. (2000). Age differences in technology adoption decisions: Implications for a changing workforce. *Personnel Psychology*, 53(2), 375-403. <https://doi.org/10.1111/j.1744-6570.2000.tb00206.x>

Naveed, Q. N., Alam, M. M., & Tairan, N. (2020). Structural equation modeling for mobile learning acceptance by university students: An empirical study. *Sustainability*, 12(20), 8618.

<https://doi.org/10.3390/su12208618>

Patil, P., Tamilmani, K., Rana, N. P., & Raghavan, V. (2020). Understanding consumer adoption of mobile payment in India: Extending Meta-UTAUT model with personal innovativeness, anxiety, trust, and grievance redressal. *International Journal of Information Management*, 54, 102144.

<https://doi.org/10.1016/j.ijinfomgt.2020.102144>

Ramli, F. A. A., & Hamzah, M. I. (2021). Mobile payment and e-wallet adoption in emerging economies: A systematic literature review. *Journal of Emerging Economies & Islamic Research*, 9(2).

<https://doi.org/10.24191/jeeir.v9i2.13617>

Rathore, H. S. (2016). Adoption of digital wallet by consumers. *BVIMSR's Journal of Management Research*, 8(1), 69.

- Riley, E. (2018). Mobile money and risk sharing against village shocks. *Journal of Development Economics*, 135, 43-58.
- Rosnidah, I., Muna, A., Musyaffi, A. M., & Siregar, N. F. (2019, March). Critical factor of mobile payment acceptance in millennial generation: Study on the UTAUT model. In *International Symposium on Social Sciences, Education, and Humanities (ISSEH 2018)*. Atlantis Press.
- Sen, A. (2019). Malaysia's overpopulated e-wallet landscape: Deep pockets not enough. *Momentum Asia*. Retrieved from <https://thelowdown.momentum.asia/malaysias-overpopulated-e-wallet-landscape-deep-pockets-not-enough/>
- Shankar, A., & Behl, A. (2021). How to enhance consumer experience over mobile wallet: A data-driven approach. *Journal of Strategic Marketing*, 1-18. <https://doi.org/10.1080/0965254X.2021.1999306>
- Shankar, A., & Datta, B. (2018). Factors affecting mobile payment adoption intention: An Indian perspective. *Global Business Review*, 19(3\_suppl), S72-S89. <https://doi.org/10.1177/0972150918757870>
- Sharma, S. K., & Mangla, S. K. (2018). Mobile wallet inhibitors: Developing a comprehensive theory using an integrated model. *Journal of Retailing and Consumer Services*, 45, 52-63. <https://doi.org/10.1016/j.jretconser.2018.08.008>
- Sharma, S. K., Sarrab, M., & Al-Shihi, H. (2017). Development and validation of mobile learning acceptance measure. *Interactive Learning Environments*, 25(7), 847-858. <https://doi.org/10.1080/10494820.2016.1224250>
- Shachak, A., Kuziemy, C., & Petersen, C. (2019). Beyond TAM and UTAUT: Future directions for HIT implementation research. *Journal of Biomedical Informatics*, 100, 103315. <https://doi.org/10.1016/j.jbi.2019.103315>
- Singh, N., & Sinha, N. (2020). How perceived trust mediates merchant's intention to use a mobile wallet technology. *Journal of Retailing and Consumer Services*, 52, 101894. <https://doi.org/10.1016/j.jretconser.2019.101894>
- Soodan, V., & Rana, A. (2020). Modeling customers' intention to use e-wallet in a developing nation: Extending UTAUT2 with security, privacy, and savings. *Journal of Electronic Commerce in Organizations (JECO)*, 18(1), 89-114. <https://doi.org/10.4018/JECO.2020010105>
- Subaramaniam, K., Kolandaisamy, R., Jalil, A. B., & Kolandaisamy, I. (2020). The impact of e-wallets for current generation. *J. Adv. Res. Dyn. Control Syst*, 12(1), 751-759.
- Upadhyay, N., Upadhyay, S., Abed, S. S., & Dwivedi, Y. K. (2022). Consumer adoption of mobile payment services during COVID-19: Extending meta-UTAUT with perceived severity and self-efficacy. *International Journal of Bank Marketing*. <https://doi.org/10.1108/IJBM-06-2021-0262>
- Uddin, M. S., & Akhi, A. Y. (2014). E-wallet system for Bangladesh an electronic payment system. *International Journal of Modeling and Optimization*, 4(3), 216. DOI:10.7763/IJMO.2014.V4.376
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186-204. <https://doi.org/10.1287/mnsc.46.2.186.11926>
- Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly*, 115-139.

<https://doi.org/10.2307/3250981>

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 425-478. <https://www.jstor.org/stable/30036540>

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 157-178. <https://doi.org/10.2307/41410412>

Williams, M. D. (2021). Social commerce and the mobile platform: Payment and security perceptions of potential users. *Computers in Human Behavior*, 115, 105557. <https://doi.org/10.1016/j.chb.2018.06.005>

Wong, D., Liu, H., Meng-Lewis, Y., Sun, Y., & Zhang, Y. (2022). Gamified money: Exploring the effectiveness of gamification in mobile payment adoption among the silver generation in China. *Information Technology and People*, 35. <https://doi.org/10.1108/ITP-09-2019-0456>

Winarno, W. A., Mas'ud, I., & Palupi, T. W. (2021). Perceived enjoyment, application self-efficacy, and subjective norms as determinants of behavior intention in using OVO applications. Retrieved from <http://repository.unej.ac.id/handle/123456789/105164>

Weerakkody, V., Al-Shafi, S., Irani, Z., & Lee, H. (2009). E-government adoption in Qatar: An investigation of the citizens' perspective. Retrieved from <https://aisel.aisnet.org/digit2009/3>

Xinhua News Agency. (2021, February 24). Cybercrime costs Chinese citizens more than \$22 billion. Retrieved from <http://www.news.cn/>

Y.-L. Lee (2021). Southeast Asia is the world's fastest-growing region for mobile wallets. Bloomberg. Retrieved from <https://www.bloomberg.com/news/articles/2021-07-08/southeast-asia-is-world-s-fastest-growing-mobile-wallet-market>

Zhang, Y., Zhai, X., & Zhang, Y. (2019). Mobile Payment Usage in China: A Multi-Dimensional Perspective. *Sustainability*, 11(1), 159. <https://doi.org/10.3390/su11010159>