Understanding the consumer's intention to use the e-wallet services

Comprendiendo la intención del consumidor de utilizar los servicios de monedero electrónico

了解消费者使用电子钱包服务的意向

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Abstract

Purpose – The purpose of this paper is to investigate the key factors that explain intention to use e-wallet services (perceived usefulness, perceived ease of use, attitude, subjective norm, positive disconfirmation and perceived behavioral control). The moderating role of perceived value in the relationship between satisfaction and their intention to continue using the e-wallet is also examined.

Methodology – A total of 257 e-wallet users participated in an online survey and hypotheses were tested with SPSS/PLS-SEM.

Findings – The constructs technology acceptance model (TAM), theory of planned behavior (TPB) and user satisfaction affect intention to use. However, perceived value does not strengthen the relationship between user satisfaction and e-wallet usage intention.

Practical implications – The TAM, TPB and expectancy disconfirmation model (EDM) constructs help explain the use of e-wallet services. These results will help the providers of these services to understand user behavior and to design their marketing strategies more appropriately to ensure consumer satisfaction and their intention to use e-wallet services.

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Originality – This study adopts a holistic and integrative approach to explain the continued use of e-wallet services. The model integrates three basic adoption theories: TAM, TPB and EDM.

Keywords User satisfaction, Perceived value, e-wallet, Integrated model, Continuance usage, TPB, TAM, EDM

Paper type Research paper

Resumen

Propósito – El propósito es investigar los factores clave que explican la intención de utilizar los servicios de monedero electrónico (utilidad percibida, facilidad de uso percibida, actitud, norma subjetiva y control conductual percibido). También se examina el papel moderador del valor percibido en la relación entre la satisfacción y su intención de seguir usando el monedero electrónico.

Metodología – 257 usuarios de monederos electrónicos participaron en una encuesta online y las hipótesis fueron contrastadas con SPSS/PLS-SEM.

Hallazgos – los constructos TAM (modelo de aceptación de la tecnología), TPB (teoría del comportamiento planificado) y la satisfacción del usuario afectan a la intención de uso. Sin embargo, el valor percibido no refuerza la relación entre la satisfacción del usuario y la intención de uso del monedero electrónico.

Originalidad – Este estudio adopta un enfoque holístico e integrador para explicar el uso continuado de los servicios de monedero electrónico. El modelo integra tres teorías básicas de adopción: TAM, TPB y EDM (modelo de desconfirmación de expectativas).

Implicaciones prácticas – los constructos TAM, TPB y EDM permiten explicar el uso de los servicios de monedero electrónico. Estos resultados ayudarán a los proveedores de estos servicios a comprender el comportamiento de los usuarios y diseñar sus estrategias de marketing de forma más adecuada para garantizar la satisfacción del consumidor y su intención de utilizar los servicios de monedero electrónico.

Palabras clave – Monedero electrónico, Satisfacción del usuario, TPB, TAM, EDM, Valor percibido, Uso continuado, Modelo integrado

Tipo de artículo – Trabajo de investigación

摘要

目的 – 目的是研究解释使用电子钱包服务意向的关键因素（感知的有用性、感知的易用性、态度、主观规范和感知的行为控制）。此外，还研究了感知价值在满意度和他们继续使用电子钱包的意向之间的调节作用。

方法 – 257名电子钱包用户参与了一项在线调查，用SPSS/PLS-SEM对假设进行了检验。

研究结果 – TAM（技术接受模型）、TPB（计划行为理论）和用户满意度影响使用意向。然而，感知价值并没有加强用户满意度和电子钱包使用意向之间的关系。

原创性 – 本研究采用了一种整体和综合的方法来解释电子钱包服务的持续使用。该模型整合了三个基本的采用理论：TAM、TPB和EDM（期望不确认模型）。

实际意义 – TAM、TPB和EDM构造有助于解释电子钱包服务的使用。这些结果将有助于电子钱包服务提供商了解用户行为，并更恰当地设计他们的营销策略，以确保消费者的满意度和他们使用电子钱包服务的意向。

关键词 – 电子钱包, 用户满意度, TPB, TAM, EDM, 感知价值, 持续使用, 综合模型

文章类型 – 研究型论文

1. Introduction

The integration of wireless telecommunication, smartphone and banking systems has created digital payment ecosystems, such as mobile payment (m-payment), gradually replacing the conventional paper currency (Sharma *et al.*, 2018). Among several categories

that can be grouped under m-payment, mobile electronic wallet (e-wallet) is one of the most important components in the digital payment ecosystem. Given the high smartphone adoption rate worldwide, the value of the mobile e-wallet industry is expected to increase significantly globally. The market size of e-wallet transactions is projected to grow to US$6.4bn by 2022, and it is forecasted to growth to US$9.4bn in 2025 (Statista, 2021). E-wallet is a convenient cashless mode to make transfers, payments to people, merchants via smartphone, and it works by storing funds from the bank account either by using debit or credit card or online transfer using banking systems (Bagla and Sancheti, 2018). The payment can be accepted through QR code scanning or in-application payment and has an option to transfer funds between individuals, also known as a peer-to-peer (P2P) transaction (Razer, 2019). This type of e-wallet is supported by many banks and non-bank organizations that are competing to provide convenience in financial transactions for their consumers (Bagla and Sancheti, 2018).

During COVID-19 pandemic, the digitization of banking and financial services has played an important role as a preventive measure to minimize the spread of COVID-19. The pandemic led to a shift in consumer preferences towards digital payment methods, such as e-wallets, instead of traditional payment methods (Daragmeh *et al.*, 2021). However, according to Ismail (2021), the continuity of e-wallet usage is still low and unsatisfying. The e-wallet industry is still in its infancy stage where many players are spending heavily to acquire customers and merchants according to findings (Ismail, 2021). Previous studies show that some consumers are reluctant to accept or to continuously use the e-wallet application. A negative feeling that they perceived toward e-wallet application has affect their behaviour intention toward e-wallet application (Yong *et al.*, 2018).

A review of the literature on digital payments reveals that most of the studies are focused on the factors that influencing consumer continuance intention to use m-payment, such as pre-adoption and post-adoption continuance intentions (Gupta *et al.*, 2020), security (Wu *et al.*, 2019), antecedents of trust (Shao *et al.*, 2019) and user satisfaction (Liao *et al.*, 2007). However, there has been little focus on studying the influencing factor of consumer intention to use the e-wallet services, especially during COVID-19 pandemic (Daragmeh *et al.*, 2021). In specific, there is still a lack of empirical evidence about the relationship of few factors such as perceived value, perceived usefulness, perceived ease of use, disconfirmation, subjective norm, perceived behavioural control, satisfaction, affecting consumer's continuance intention to use e-wallet (Gupta *et al.*, 2020; Wang *et al.*, 2019; Alalwan, 2020). In relation to consumer behaviour, it is important to investigate human behaviour that is related to behavioural intentions as well as perceived value and perceived behavioural control that determined the attitude of consumers to stay loyal to the products and services (Alalwan, 2020), especially product and services that involved with technologies. Some variables such as user satisfaction and perceived value may be hard and challenging to be concluded as its complex construct may differ among people.

The present study aims to address the research gap by understanding consumer decision making factors that influence their intention to continuously use the e-wallet services from the perspective of user satisfaction, system characteristics and human behavioural belief, as well as to explore whether these factors influencing positively and significantly their continuance intention to use e-wallet. Additionally, this study also aims to examine how perceived value such as discounts and cashback, rewards, security to perform the transaction and saves time and effort during payment plays a significant role in the relationship between user satisfaction and continuance intention to use e-wallet.

To achieve the research objective, this study integrated three theories such as theory acceptance model (TAM), theory of planned behaviour (TPB) and expectation

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disconfirmation model (EDM). In past research, the previous studies have mainly examined the current constructs in the different contexts of digital payments such as m-payment and its other technologies. Limited studies have focused on the mobile electronic wallet (e-wallet) context, especially during the pandemic whereby consumers' preferences have shifted toward digital payments to minimize the spread of Covid-19 (Daragmeh *et al.*, 2021). Thus, this study fills up the gap by examining the key constructs of TAM, TPB, EDM in the e-wallet services context. By integrating these theories, it is expected that these theories may explain in what way these constructs (perceived value, perceived usefulness, perceived ease of use, attitude, subjective norm, positive disconfirmation, perceived behavioural control, user satisfaction) influence consumer intention to continuously use the e-wallet services (Bhattacherjee and Lin, 2015).

2. Literature review
2.1 Theories integration rationale
The main objective of this study is to investigate the post-adoption behaviour of e-wallet users. Expectation-disconfirmation model (EDM), theory of planned behaviour (TPB) and technology acceptance model (TAM) are the most widely applied theories that can elaborate the continuance intention (Foroughi *et al.*, 2019). This study proposed a model using the foundations of the key constructs related to TAM, EDM and TPB to understand the continuance intention to use an e-wallet. The key constructs will be investigated to reflect the impact of a customer's expectation of e-wallet systems that lead to user satisfaction and intention to continuous use (Gupta *et al.*, 2020; Liao *et al.*, 2007) from the perspective of system characteristics and behavioural belief. The TPB concepts can explain and analyse human behaviour intention, meanwhile, the TAM concept reflects perceived ease of use and perceived usefulness of certain technology or system. In this current context, it refers to e-wallet services. TPB alone would not be able to explain consumer perceived technology of a certain system. Research has shown that human behaviour towards accepting a technology is multi-faceted and warrants more than a single model, i.e. an integrated approach (Shen *et al.*, 2010). Integrated models not only offer an all-inclusive and wide-ranging view of the causal mechanism underlying the relationships but also bring an exclusive understanding which cannot be accomplished by models grounded on a single theory (Thusi and Maduku, 2020). Thus, both models would be fully synthesizing in a complementary manner to better understand what factors that drive consumers' intention to continuously use e-wallet services. Concerning the TAM model, it has been widely used in the literature to analyse the adoption of very different types of innovations such as innovative information systems (Gupta *et al.*, 2020), mobile payment (Ariffin and Lim., 2020), mobile payment services (Phonthanukitithaworn *et al.*, 2015). However, limited studies have been studied in the e-wallet services context using TAM model.

Nevertheless, most of the previous studies have focused and integrated these theories on the pre-adoption decision-making processes (Gupta *et al.*, 2020). Limited studies focused on the post-adoption processes. Consumers repurchase behaviour continuously catches the attention of researchers since the largest portion of consumer purchases are in the second time of purchase rather than the initial acceptance (Oliver, 1993). Concerning the post-adoption process, this study integrates EDM into the current model to fill up the gap. To clarify how customer satisfaction can affect consumer repurchase behaviour or customer retention, and application of EDM can explain the consumer consumption decision in the post-purchase process (Liu *et al.*, 2020). According to Ismail (2021), the continuity of e-wallet usage is still low and unsatisfying. Thus, the key constructs of EDM are important to be included in this study. User disconfirmation and satisfaction toward e-wallet services are

important to be examined to identify critical factors that influence consumer intention to continuously use e-wallet services. The hypothetical relationship between disconfirmation and customer satisfaction has become a key point in the area of consumer research and has been examined in many empirical studies (Oliver, 1997). Disconfirmation is the result of consumers' perceived differences between expectations and performances. Disconfirmation is falling under 3 categories which is positive disconfirmation (performance outperformed expectation), negative disconfirmation (Performance fall be expectation) and confirmed (Performance similar with expectation). Meanwhile, satisfaction is the overall outcome of disconfirmation. Because of that, this study will examine consumer positive disconfirmation and satisfaction toward intention to continue the use of e-wallet. The integration of these three theories can contribute toward consumer decision-making factors from three perspectives such as consumer satisfaction, consumer perceived technology and consumer behavioural intention or human behavioural. Furthermore, the EDM holds the explanation that satisfaction is the only requirement that determines a consumer's intention to repurchase or reuse (Gupta *et al.*, 2020; Liao *et al.*, 2007). Therefore, this study will examine satisfaction as the antecedent toward consumer intention to continuously use e-wallet services. The development of the hypotheses will be primarily based on the effects of TAM, TPB and EDM on user satisfaction. Hence, this study will not examine satisfaction as the mediator variable.

According to the previous literature, most of the studies developed their conceptual model using these theories are in different context-setting such as user's continue intention to use mobile catering apps (Wang *et al.*, 2019), information systems, digital payments, online services (Alalwan, 2020; Alalwan, 2017), mobile payment (Ariffin and Lim, 2020; Ting *et al.*, 2016) social media and network (Gupta *et al.*, 2020). In summary, most of the previous studies have adopted these theories in the context of mobile payment and other technologies. However, limited knowledge is known about consumer intention to continuously use e-wallet services, especially during the Covid-19 pandemic. Therefore, this study fills up the gap by examining the relationship between these factors and intention to continuously use e-wallet services. Consequently, based on the above discussions, it is expected that the integration of TAM, EDM and TPB will provide a more comprehensive viewpoint of post-adoption usage of e-wallet users.

In addition, this study adds perceived value into the framework as the moderator variable to widely explain user satisfaction and intention to continuous use of e-wallet (Liu *et al.*, 2020). It is considered fundamental for all marketing activities to maintain competitive advantages (Karjaluoto *et al.*, 2019). Perceived value will give some emotional consumer's expression such as fun, enjoyment and expressiveness that lead to the positive effect on satisfaction (Liu *et al.*, 2020). Thus, it is expected that consumer perceived value will strengthen the relationship between user satisfaction and intention to continuously use the e-wallet services.

2.2 Hypothesis development
2.2.1 Perceived ease of use. Perceived ease of use is defined as the individual's perception that using a certain system is effortless or simply easy to do (Davis, 1989). For this reason, it is considered to be one of the qualities of the greatest impact on the acceptance of new technology (Gupta *et al.*, 2020). There are quite a few researchers experimented on users' perceived ease of use and intention to use the technology and most of the finding showed perceived ease of use has a positive and significant impact on consumer's attitude (Ariffin and Lim, 2020). Thus, the following hypothesis is proposed:

> *H1.* There is a positive and significant relationship between perceived ease of use and attitude.

2.2.2 Perceived usefulness. Perceived usefulness is defined as the potential consumer's subjective belief that using a particular system would enhance his or her job performance in an organizational context (Davis, 1989). In the previous studies, many researchers have considered the perceived usefulness as one of the factors which influence the intention to use new information technology such as mobile commerce, mobile payment, social media games, mobile catering apps, mobile banking, etc. (Gupta *et al.*, 2020; Koenig-Lewis *et al.*, 2015; Ariffin and Lim, 2020). Based on previous studies findings, perceived usefulness positively and significantly influences consumer's attitude. Thus, the following hypothesis is proposed:

H2. There is a positive and significant relationship between perceived usefulness and attitude.

2.2.3 Positive attitude. Attitude is defined as an individual's positive or negative feelings about performing the target behavior. Attitudes can be predicted accurately by a different kind of behaviour (Ajzen, 1991), such as attitude toward mobile payment or mobile apps (Wang *et al.*, 2019). Many prior studies on technology adoption consider the concept of attitude, reflecting favourable or unfavourable feelings about a particular behaviour and as an important determinant influencing the intention to continuous use (Ramos de Luna *et al.*, 2019; Yang *et al.*, 2017; Apanasevic *et al.*, 2016), Based on such prior research findings, this study defines attitude as the perceived level of positive feelings toward the use of e-wallet that will in turn influence their satisfaction toward e-wallet services. Thus, the following hypothesis is proposed:

H3. There is a positive and significant relationship between attitude and users' satisfaction.

2.2.4 Subjective norm. Subjective norm is defined as the perception of a person thought and opinion of the individual's action and decision making. The behavioural can be influenced by external and motivation to make according to the wishes of the references (Ajzen, 1991). Therefore, the subjective norm is an important variable to determine the intention to continuous use and the higher tendency of being influenced by peers on e-wallet services (Alalwan *et al.*, 2017). Subjective norm was empirically proved to have a positive and significant influence in shaping the user's satisfaction (Hsiao *et al.*, 2016; Alalwan, 2020). Hence, the following hypothesis can be proposed

H4. There is a positive and significant relationship between subjective norm and users' satisfaction.

2.2.5 Positive disconfirmation. Disconfirmation is defined as the consumer perceived differences between a pre-purchase expectation and the post-purchase performance of a product or service (Liao *et al.*, 2007). Previous studies have found that disconfirmation would fall under three category which are:

(1) positively disconfirmed whenever the product or services outperform expectations;

(2) confirmed whenever the product or services perform as expected; and

(3) negatively disconfirmed whenever the product or service performs below expectation (Oliver, 1980).

In this study, consumer positive disconfirmation and satisfaction toward intention to continue the use of e-wallet will be examined. According to Bhattacherjee and Lin (2015),

satisfaction is primarily an outcome of consumer disconfirmation through meaningful consumption experiences. Several past studies also found that disconfirmation has a significant impact on customer satisfaction which indicate positive disconfirmation was positively and significantly influence customers' satisfaction (Ambalov, 2018; Liao *et al.*, 2007). Thus, this study posits that:

H5. There is a positive and significant relationship between positive disconfirmation and users' satisfaction.

2.2.6 Perceived behavioural control. Perceived behavioural control is the third variable under TPB that explained people's perception of ease or difficulty in performing the behaviour. It is associated with the beliefs about the presence of control factors that may facilitate or hinder the performance of the behavior (Ajzen, 2002). Previous studies argue that perceived behavioural control is the belief of control which is a significant factor to the intended behaviour for consumers to perform online purchases (Ting *et al.*, 2016; Liao *et al.*, 2007; Khatimah and Halim, 2016). Past studies found that perceived behavioural control was positively related to behavioural intention. It was also found that perceived behavioural control supports the argument that higher self-efficacy creates user confidence, which in turn influences intention to reuse some applications such as e-learning, social networking and online banking. Thus, for high involvement technologies like e-wallet application, it was found that the user's perceived behavioural control shaped a positive confirmation and resulting continuance intentions (Sharma *et al.*, 2018). Therefore, this study proposed the following hypothesis:

H6. There is a positive and significant relationship between perceived behavioural control and consumer's intention to continue use of e-wallet.

2.2.7 User satisfaction. User satisfaction refer to the summary of psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience (Oliver, 1980). Previous research indicates that satisfaction is the overall outcome of consumer disconfirmation or confirmed that determined the consumers repurchase behaviour (Alalwan, 2020). User satisfaction toward m-wallet determines whether the individual will keep using it as the primary vehicle for digital payments (Wixom and Todd, 2005). Hsiao *et al.* (2016) was using the EDM and TPB as the underpinning theories to analyse and validate the relationship between user satisfaction and continuance intention toward mobile applications, the findings showed a positive impact among the variables. Similarly, several past studies found that customer satisfaction positively and significantly influences continuance intention in banking/payment services (Chu *et al.*, 2012) and mobile apps usage (Wang *et al.*, 2019). Therefore, this study proposed the following hypothesis:

H7. There is a positive and significant relationship between user satisfaction and consumer's intention to continue use of e-wallet.

2.2.8 Perceived value as moderator. Perceived value is defined as the trade-off between what customers perceived, such as quality, benefits and utilities and what they sacrifice such as price, opportunity cost, transaction cost, time and efforts (Cronin *et al.*, 2000). When the perceived value is low, customers will be more inclined to switch to competing businesses to increase their perceived value, thus contributing to a decline in loyalty (Liu *et al.*, 2020; Chang *et al.*, 2017). In relation to e-wallet, several values could be added by service providers such as by offering discounts and cashback, rewards, security to perform the transaction

and saves time and effort during payment. Past research found that perceived value was positively related to customer's satisfaction and post-purchase intention in catering apps (Wang *et al.*, 2019). Wang *et al.* (2019) indicates that consumers tend to continue to use catering apps that meet their expectations that provide real benefits. It is found that users' satisfaction and perceived value toward the catering apps can facilitate consumers' intention to reuse the catering apps. Wang *et al.* (2019) also found that perceived value positively influences and strengthens the relationship between user satisfaction and intention to reuse mobile catering apps. The relationship between customer's satisfaction and perceived value appears strongest when the customers feel that their current e-business vendors provide higher value than other competitors (Chang *et al.*, 2017; Liu *et al.*, 2020). Thus, this study proposed the following hypothesis:

H8. Perceived value strengthens the relationship between user satisfaction and consumer's intention to continue use of e-wallet.

Consequently, based on such prior discussion, the research model proposed is shown in Figure 1. The contribution should be highlighted primarily in the introduction and in the discussion and conclusions of the paper.

3. Research design and methodology
This study focuses on consumers who have adopted an e-wallet and the current users of this service in their daily life. Before answer the questionnaires, respondents are first screened to filter out the respondents. Only respondents who are the current users of e-wallet services are allowed to continue to answer the questionnaires. The population in this study is all districts in Malaysia and unit of analysis is consumers. Due to the fact that e-wallet users are usually familiar with computer and internet skills, also considering the cost and time effectiveness of the research as well as the restrictions and limitations imposed by Covid-19, online survey tool Google Form was adopted to collected data by using the convenient
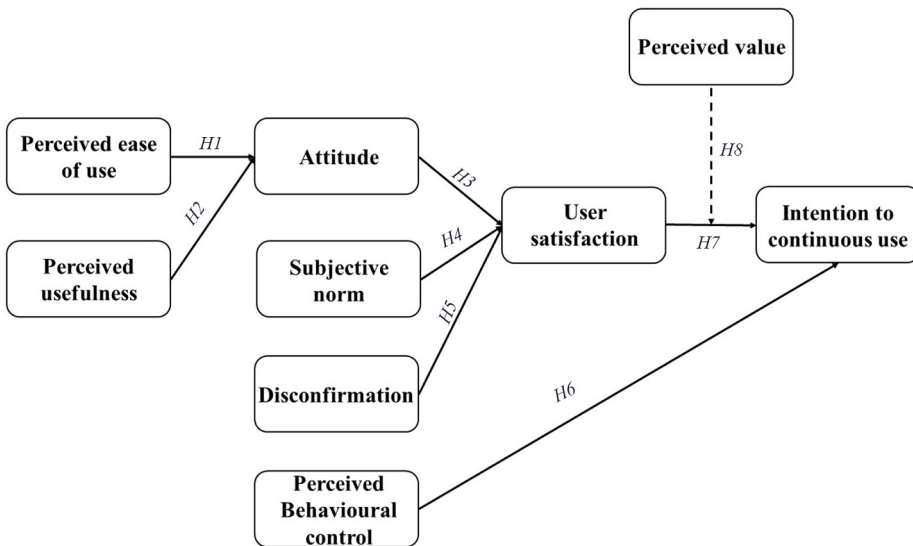

Figure 1.
Research model

sampling method. A self-administered survey was distributed to a total of 300 respondents from 18 January 2021 to 22 April 2021. The electronic survey was used in this study since it is considered as the most convenient and efficient way to collect necessary information (Sekaran and Bougie, 2016). The link of the online survey was sent out through social media platforms, such as Facebook, WhatsApp and e-mail to participants.

The structure of questionnaire is made up of three sections. Section A is to filter respondents, Section B is to collect the demographic information and Section C to G is to measure all variables. All items were measured through a five-point Likert scale ranging from one to five (1 = "Strongly Disagree, 5 = "Strongly Agree"). The five-point Likert scales were adapted from previous studies (Gupta *et al.*,2020; Liao *et al.*, 2007; Yang *et al.*, 2017; Amoroso and Magnier-Watanabe, 2012; Liu *et al.*, 2020).

3.1 Sample profile

Of the 257 online questionnaires answered, only 244 (95 %) were successfully analysed and usable for further data analysis. Respondents' profiles revealed that the majority of them were female (54.5%) as compared to men (45.5%). Most of the respondents were between 21 and 30 years of age (57.4%). This was followed by 31–40 years (30.7%), 41–50 years (9.8%) and the rest were 51 years above (1.6%). Majority of the respondents worked in the private sector (60.7%) as compared to the public sector (17.6%) followed by the students (11.1%), self-employed (8.6%) and others (2.0%). By looking at the profession, 90 (36.89%) of the total respondents worked in finance and accounting, education 21 (8.61%), science and engineering 20 (8.20%) and entrepreneur 15 (6.15%). In term of education level, 43.0% of the respondents possessed a bachelor's degree, followed by a diploma and master's degree (23.0%), high school (7.4%) and PhD (3.7%). For monthly income, most of the respondents earned RM2001-RM3500 per month (47 %), followed by 25% of them earned RM3501-RM5000 monthly, which indicates most of the respondents were part of the middle-class segment. Meanwhile, the rest of the respondents earned over RM5001- RM7500. Concerning frequent usage of e-wallet services, the majority of the respondent (34.4%) stated that they have spent monthly usage on e-wallet services, followed by weekly usage (23.8%), daily (13.9%) and lastly quarterly (10.2%).

4. Results

4.1 Measurement model

A confirmatory factor analysis corroborated the initial factor structure. This study planned to successively eliminate indicators that did not meet the criteria proposed by Jöreskog and Sörbom (1993). Based on these criteria, in the present study it was not necessary to eliminate any item. Thereafter, this research examines the outer model validity and reliability of constructs, composite reliability (CR), average variance derived (AVE) and Fornell–Larcker criterion in accordance with Hair *et al.* (2019). Table 1 contains the output of the outer model.

As shown in Table 1, CR and AVE are all greater than 0.7 and 0.5. The square root of the AVE for each latent variable are greater than the correlation between latent variables. The intercorrelations between each latent variables, and the value was greater than correlation between latent variables (ranging between 0.73 to 0.92), thus, the concepts' convergent validity and discriminant validity were satisfactory established for the measurement model.

4.2 Structural model

After completing the measurement model evaluation, we continue to test the structural model. Initially, variance inflated factor (VIF) was measured. The ideal value of VIF should

Variables	α	CR	AVE	1	2	3	4	5	6	7	8	9
ATT (1)	0.86	0.90	0.70	*0.84*								
DCF (2)	0.93	0.95	0.84	0.51	*0.92*							
CI (3)	0.94	0.96	0.85	0.49	0.54	*0.92*						
PBC (4)	0.95	0.96	0.82	0.42	0.50	0.77	*0.91*					
PEOU (5)	0.92	0.94	0.80	0.55	0.51	0.78	0.63	*0.89*				
PU (6)	0.87	0.91	0.73	0.59	0.48	0.60	0.49	0.65	*0.85*			
PV (7)	0.84	0.90	0.76	0.32	0.42	0.68	0.56	0.53	0.44	*0.87*		
SAT (8)	0.94	0.96	0.81	0.67	0.63	0.84	0.67	0.83	0.70	0.60	*0.90*	
SN (9)	0.81	0.85	0.53	0.42	0.41	0.62	0.50	0.61	0.50	0.45	0.65	*0.73*

Notes: α: Cronbach's α; CR: Composite reliability; AVE: Average Variance Extracted. ATT: ATT; DCF: DCF; CI Continuance Intention; PBC: Perceived Behavioral Control; PEOU: Perceived Ease of Use; PU: Perceived Usefulness; PV: Perceived Value; SAT: SAT; SN: Subjective Norm. The diagonal elements (in italic) are the square root of the AVE. Values above the diagonal indicate the Fornell–Larcker criterion ratio. Values below the diagonal elements are the inter-construct correlations

Table 1.
Reliability, convergent and discriminant validity

be less than 3.3 (Hair *et al.*, 2019). The VIF of all constructs is less than 3.3. Next, R^2 values range from 0 to 1 where the higher value indicates a greater explanatory power. The R^2 value of 0.75 is substantial, 0.50 is moderate and 0.25 is weak (Hair *et al.*, 2019). The R^2 values for both ATT (0.399) and SAT (0.671) are considered moderate, while the R^2 value for CI (0.805) is considered substantial to measure the variance.

Next, the effect size (f^2) value of 0.02 has small effects, 0.15 has medium effects and 0.35 has large effects (Hair *et al.*, 2019). If the effect size is less than 0.02, it indicates that there are no effects. In this study, the f^2 values for PV (0.010) has no effects on intention to continuous use. It shows that SAT (0.636) has large effects on CI, while PU (0.158) has medium effects on ATT. The fourth step is to assess the predictive relevance (Q^2) using the blindfolding approach. Q^2 values larger than zero indicated the path model's predictive accuracy and relevance (Hair *et al.*, 2019). The Q^2 values higher than 0, 0.25 and 0.5 indicate small, medium and large predictive accuracy, respectively. In this study, ATT (0.266) indicated small predictive relevance, while the CI (0.669) and users' SAT (0.540) indicated large predictive relevance.

The final step is to assess the significance and relevance of the structural model relationships using the path coefficient to determine whether the conceptual model or theoretical hypotheses were substantiated empirically. The arrows or paths represent the hypothesized relationships between the constructs (Hair *et al.*, 2019). As shown in Figure 2, the results of the path coefficient demonstrate that there is a significant relationship between perceived ease of use and attitude (β = 0.29, t = 3.81, $p < 0.05$; *H1* supported), perceived usefulness and attitude (β = 0.40, t = 4.57, $p < 0.05$; *H2* supported), attitude and satisfaction (β = 0.36, t = 7.87, $p < 0.05$; *H3* supported); subjective norm and satisfaction (β = 0.37, t = 8.46, $p < 0.05$; *H4* supported), positive disconfirmation and satisfaction (β = 0.30, t = 6.07, $p < 0.05$; *H5* Supported), perceived behavioural control and continuance intention (β = 0.30, t = 6.98, $p < 0.05$; *H6* supported) and satisfaction to continuance intention (β = 0.53, t = 11.54, $p < 0.05$; *H7* supported). In contrast, the moderating effect of perceived value in the relationship between satisfaction and continuance intention is found to be insignificant (β = 0.03, t = 1.51, $p > 0.05$; *H8* not supported). In summary, seven hypotheses are supported (*H1*, *H2*, *H3*, *H4*, *H5*, *H6* and *H7*), and only one hypothesis is not supported (*H8*).
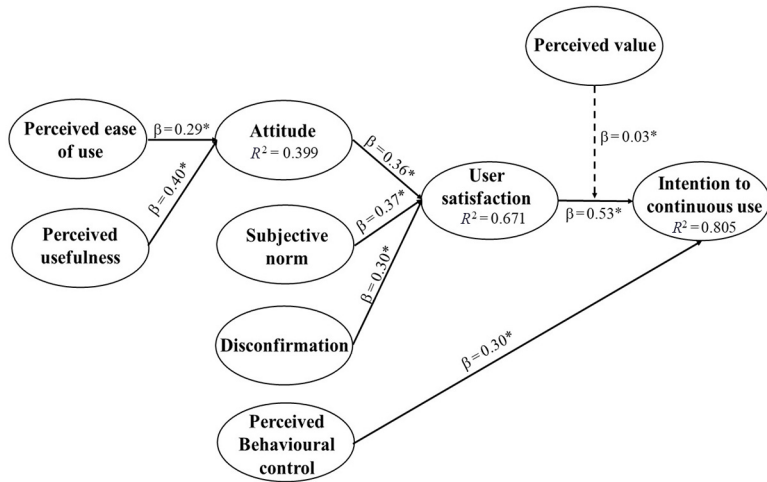
Figure 2.
Results of the path
coefficient

Notes: *$p < 0.05$; $p < 0.01$; ***$p < 0.001$

5. Discussion

This study aims to examine the relationship between perceived ease of use and perceived usefulness towards attitude, attitude, subjective norm, positive disconfirmation toward satisfaction, and perceived Behavioral control and satisfaction towards continuance intention to use e-wallet. Moreover, this study also examines whether perceived value strengthens the relationship between user satisfaction and continuance intention.

The findings of *H1* and *H2* coincide with the previous studies stating that perceived ease of use and perceived usefulness positively and significantly influences user's attitude toward using mobile payment (Bagla and Sancheti, 2018; Mun *et al.*, 2017; Ariffin and Lim, 2020). The finding of this study shows that consumer found it was easy in conducting payment transactions by using e-wallet and having an e-wallet improved their payment processing and enhanced their effectiveness in doing transactions that led to their positive attitude toward e-wallet services. Similarly, the findings of *H3*, *H4* and *H5* also align with previous research that stated attitude, subjective norms and positive disconfirmation have positive and significant impacts on user satisfaction (Yang *et al.*, 2017; Ting *et al.*, 2016; Alalwan, 2020; Hsiao *et al.*, 2016; Ambalov, 2018; Okumus *et al.*, 2018). Based on these findings, it is possible to say that consumers feel pleasant when using e-wallet and consumers experience of e-wallet was beyond their expectation that led to their satisfaction toward e-wallet. Besides that, their peers, families and the environment have also influenced their intention to continuously use e-wallet.

Furthermore, the findings of *H6* and *H7* align with previous studies that stated perceived behavioural control and user satisfaction were found to be significant towards intention to continuous use (Ting *et al.*, 2016; Liao *et al.*, 2007; Hsiao *et al.*, 2016; Chu *et al.*, 2012; Gupta *et al.*, 2020). Based on these findings, it reveals that consumers nowadays have enough resources to reuse the e-wallet and they will also continue to use e-wallet services as long as the e-wallet system function exceeded their expectation.

Meanwhile, the finding of *H8* is found to be insignificant. The finding of this study contradicts with the past study which showed that perceived value strengthening the

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relationship between customers' satisfaction and intention to continuous use (Chang *et al.,*
2017). For instance, Wang *et al.* (2019) found that perceived value positively influences and
strengthens the relationship between user's satisfaction and intention to reuse mobile
catering apps (Wang *et al.,* 2019). Concerning the finding of this study, it is possible to say
that consumers would continue using the e-wallet services although there are no rewards
and cashback offered. During the Covid-19 pandemic, consumers' preferences are shifted
toward digital payment include e-wallet services to minimize the spread of viruses.
Consumers are satisfied with the existing e-wallet services that offered security to perform
the transaction and save time and effort during payment without thinking of other possible
rewards. Hence, it can be concluded that perceived value does not strengthen the
relationship between user satisfaction and continuance intention to use of e-wallet.

5.1 Study implications
This study has both theoretical and practical implications. Theoretically, this study found
that consumers' continuance intention to use e-wallet services was influenced positively and
significantly by their perceived ease of use, perceived usefulness, attitude, subjective norm,
positive disconfirmation, perceived behavioural control and satisfaction from the e-wallet
services, especially during the Covid-19 pandemic. These findings will contribute toward
digital payment research, especially on the continuity of e-wallet usage and satisfaction
toward e-wallet services. In addition, the findings of this study added to the literature
regarding the added role of perceived value that was found to have an insignificant effect on
user's satisfaction and continuance intention to use the e-wallet services. Although the
hypothesis was not supported, it will give some new perspective to the body of literature to
further study this finding. The previous study on perceived value had touched mainly on the
rewards such as discount, cashback and value offered by the service providers. In the
current research, to minimize the spread of COVID-19, consumers have shifted toward
digital payment methods and continue using e-wallet services without considering the value
offered.

This study has also integrated three theories such as Expectation DCF Model (EDM),
TPB and TAM to help explain in what way these constructs influence consumers' intention
to continuously use of e-wallet from the perspective of system characteristics and
behavioural belief. Although the integration of theories among TAM, TPB and EDM have
been recognized in the literature such as TAM and TPB or EDM and TPB (Kamble *et al.,*
2019; Liao *et al.,* 2007), however, based on the researcher knowledge, this is one of the first
studies integrate these three theories in one model that examine the relationship between its
key factors and behavioural intention. The statistically validated model is found to have
high explanatory power with the independent constructs explaining 80.5% variance of the
behavioural intention ($R^2 = 0.805$) and hence proves to be a valuable contribution to the
existing body of research. The findings of this study also reveal that the TAM, TPB and
EDM constructs does play a significant role in influencing consumer behavioural intention
toward e-wallet services. This study empirically validates that the TAM, TPB and EDM
constructs need be given importance while using e-wallet services. This study will serve as
the foundation and lead to many more studies on the intention to use e-wallet services in the
future.

Practically, the findings of this study will be significant to the digital payments
organisations to manage better and improve the existing e-wallet systems and platforms.
This study helps to identify the critical factors to satisfy consumers toward e-wallet services
that will lead to the intention to continuously use the services. This study has shown that
consumer perceived ease of use, perceived usefulness, attitude, subjective norm, positive

disconfirmation and satisfaction have led to a positive impact on consumer's continuance intention to use e-wallet services. These study findings can be useful not only to digital payment organisations but also for financial and banking institutions, entrepreneurs, retailers, policymakers, government sectors and telecommunications to name a few. This study can help and inform policymakers to plan and improve their strategies/frameworks to support the e-wallet service providers towards a cashless society.

5.2 Limitations and suggestion for future research
This study has certain limitations such as a single-country context and the convenience sampling methods which was adopted to collect data. Different countries have different e-wallet payment systems and functions that will contribute to a different result in terms of consumers' behavioural and technology post-adoption. Future research may study e-wallet by looking at other geographically and demographically diverse perspectives such as countries, age, rural or urban areas. As this kind of payment method requires a good facility, consumers from rural areas might have different perceptions of the consumption of e-wallet. Meanwhile, biased results might be obtained due to the disadvantages of convenience sampling technique such as the inability to generalize the results of the survey to the whole population (Sekaran and Bougie, 2016), for example, the survey collected are much more likely come from users in urban area rather than rural area due to the difference in total user numbers. Besides that, other cognitive variables such as trust and security may be also studied towards continuous use of e-wallet. The effect of trust on user's behavioural intention would provide significant insight into the context of this study. In addition, this study has not examined the mediation analysis of satisfaction. Future research may examine satisfaction as the mediator variable to confirm the satisfaction contribution to the existing model.

6. Conclusion
During the COVID-19 pandemic, the findings of this study shows that perceived ease of use and perceived usefulness were found to have a positive impact on consumer's attitude. Furthermore, attitude, subjective norm, positive disconfirmation and perceived behavioural control were found to have significant effects towards users' satisfaction and continuance intention to use e-wallet. Meanwhile, the perceived value was found to have an insignificant effect in strengthening the relationship between users' satisfaction and continuance intention to use of e-wallet. It shows that discounts and cashback, rewards, security to perform the transaction and saves time and effort during payment did not affect consumer behaviour toward e-wallet continuance usage. In a conclusion, this study shows that out of eight hypotheses, seven of them were supported toward continuance intention to use e-wallet. It is hoped that the findings of this study benefit the marketers, organisations, scholars and the government to enhance the use of e-wallet among consumers.

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