The impact of perceived usability on mobile wallet acceptance: a case of Gopay Indonesia

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Abstract: The rapid growth of mobile communication technology leads to the more frequently used mobile payments particularly the mobile wallet (m-wallet). This research aims to identify the factors that influence the use intention of mobile wallet in Indonesia, particularly from the perceived usability perspective, combined with the technology acceptance model (TAM). This research employs survey research by distributing an online questionnaire to users of Gopay, which is a leader of m-wallet providers in the Indonesian market. The data from 167 valid respondents were processed and analysed using partial least square (PLS) with the help of SmartPLS 2.0 software. Our findings showed that perceived usability affects users' intention to adopt m-wallet through perceived usefulness and perceived enjoyment variables. This paper also discusses several recommendations for m-wallet providers and developers to increase m-wallet adoption in Indonesia.

Keywords: innovation; mobile wallet; technology acceptance model; TAM; perceived usability; Indonesia; learning.

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1 Introduction

The rapid development of mobile communication technology, wireless networks, mobile internet, and smartphones triggered the emergence of mobile-based payments, also known as mobile payments (Marinova, 2017). One of the latest and most popular mobile payment methods is mobile wallet (ITU-T, 2013). Mobile wallet could replace the function of a common wallet through an application or a virtual wallet that is equipped with functions such as bank cards, credit cards, control IDs, member cards, and others (Shin, 2009). Mobile wallet is ready to replace conventional payment methods that use cash, credit cards and debit cards (Congdon, 2016).

The development of mobile payments and mobile wallets in Indonesia was established through the launch of the National Non-Cash Movement (GNTT) by Bank Indonesia in 2014. This movement aims to realise cashless society in Indonesia. The society is expected to reduce the use of cash and switch to safer, faster and more efficient non-cash payments (Sugiarti and Daryanti, 2015). Mobile wallet as a cashless supporting product provides many benefits to users. Mobile wallet allows users to make electronic payment transactions via mobile device without having to have a bank account (Sugiarti and Daryanti, 2015). Mobile wallet offers convenience in downloading the application, a direct verification on the application, a low balance top-up without administrative costs, a simple payment method by scanning the QR code, as well as a high level of secure transaction for users (Megadewandanu et al., 2016).

In Indonesia, there are several mobile wallet providers and one of them is Gopay provided by Gojek (ITU-T, 2013). Gojek is Southeast Asian on-demand multi-service platform and digital payment technology group, which is originally from Indonesia. Gopay can be used to pay transactions inside and outside the Gojek application. Data on the Bank Indonesia website (bi.go.id) as of 4 March 2019 shows that Gopay is officially registered as an electronic money provider and operating since 29 September 2014. However, although there are several mobile wallet providers in Indonesia, the adoption rate of mobile wallet is still limited. Since 2016 the rate of adoption of mobile wallets in Indonesia is still low; mobile wallet transactions are only around 1% of total transactions using electronic payments (Megadewandanu et al., 2016). This is because mobile wallet is still relatively new in the society. Thus, currently, little is known about how to accelerate the adoption of mobile wallet in Indonesia.

Adoption of a technology has been discussed in the previous literature using several theories such as technology acceptance model (TAM) (Davis, 1989) and unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003) and their extensions. These theories have also been adopted for modelling mobile payment acceptance in many countries. Di Pietro et al. (2015), Schierz et al. (2010) and Shaw (2014) are among studies that used TAM model combined with other factors. Di Pietro et al. (2015) used TAM model combined with security and compatibility constructs to model the users' adoption on mobile payment in the transportation service context.

Schierz et al. (2010), in addition to TAM constructs, they also investigated the effects of compatibility, individual mobility, and subjective norm on mobile payment adoption. Shaw added trust factor in his proposed model to investigate the drivers of Canadian in adopting mobile payment. Liébana-Cabanillas et al. (2018) also adapted TAM for modelling mobile payment acceptance. de Sena Abrahão et al. (2016), Oliveira et al. (2016) and Qasim and Abu-Shanab (2016) adapted UTAUT to model the adoption of mobile payment. Qasim and Abu-Shanab (2016) extended UTAUT by adding network externalities construct. Oliveira et al. (2016) extended UTAU2 with innovativeness, compatibility, and perceived security construct in Portugal context. While de Sena Abrahão et al. (2016) adapted UTAUT and adding perceived risks and costs for modelling mobile payment acceptance in Brazilian context. Other researchers used different theories. For example, valence theories are used in Hidayanto et al. (2015) and Ozturk et al. (2017), risk theory is deployed in Yang et al. (2015), and trust-transfer theory is used in Tombe et al. (2017).

Previous research on mobile wallets in Indonesia has been conducted by several scholars. Megadewandanu et al. (2016) and Limantara et al. (2018) used the extension of UTAUT2 model to see the factors driving mobile wallet adoption. Hunafa et al. (2017) employed other theories by taking technology, personal, and environment (TPE) framework to investigate mobile wallet acceptance, while Chandra et al. (2018) used the TAM model as the underlying theory for modelling mobile wallet adoption.

Based on the results of previous studies, it could be seen that there have been some studies conducted to model mobile wallet acceptance, which mainly used TAM, UTAUT, net valence model, trust, and risk perspectives. In the context of technology adoption, because of the fast growth of mobile apps as the backbone of mobile wallet technology, the usability becomes an essential factor of technology adoption as it is related to the users' enjoyment in using the technology. A technology that is easy to use and does not impose a burden on users would be more quickly adopted (Lacka and Chong, 2016; Scholtz et al., 2016). However, there has been no prior research linking perceived usability (PUS) to mobile wallet adoption. This is the main knowledge gap that we want to address in this research. The significance of the PUS factor encourages us to conduct a study to analyse the adoption of mobile wallet in Indonesia from the usability factor perspective.

Therefore, this study aims to analyse the users' intention to adopt mobile wallet in Indonesia based on PUS factor combined with the perceived usefulness (PU) and perceived enjoyment (PE) factors which have been widely used to model the technology adoption. It is expected that the results of this study would help increase and accelerate the adoption of mobile wallets in Indonesia and assist the mobile wallet providers in identifying aspects of their services that could be further improved. As a case study, we used a mobile wallet, namely Gopay, which is currently a leader in the mobile wallet services. Gopay is a mobile payment solution from Gojek, the largest multi-platform service provider in Indonesia.

The rest of this paper is organised as follows: Section 2 provides the theoretical background of this study, Section 3 presents the proposed conceptual model, and Section 4 discusses the research methodology, and Section 5 presents the results and discuss the study implications. Finally, Section 6 concludes the paper by outlining a number of future research directions.

2 Theoretical background

2.1 Mobile wallet in Indonesia

Mobile wallet is emerging as the latest development in the payment ecosystem (Lowry, 2016). Mobile wallet is a payment platform that saves money as a value on a digital account in an application and can be used for payments without using a debit/credit card (Abdulrahaman et al., 2018). Mobile wallet is one of the approaches that is mostly used to provide payment services through mobile devices. It is currently part of modern lifestyles and is driven by the fast adoption and high popularity of mobile internet. The concept of mobile wallet is increasingly being adopted in developed and developing countries to increase productivity and being a part of banking services (Sharma et al., 2018). Mobile wallet is intended to replace the physical wallet, banknotes, coins, plastic cards, and other cards (Olsen et al., 2011). Thus, it could be concluded that mobile wallet is a medium that provides payment services using mobile devices as a means and begins to develop rapidly in the digital era as it is today.

In Indonesia, Gopay is a mobile wallet apps that is most frequently used in Indonesia (CNBC Indonesia, 2019). In iPrice Group and App Annie's research released on 12 August 2019, Gopay became a mobile wallet with the most active users in Indonesia. According to this research, 30% of electronic money transactions in Indonesia come from Gopay. Gopay is a mobile wallet service created by Gojek to support the payment of its various services. At present, Gopay is not only used to pay for services within the Gojek application, but it can be also used to pay various goods and services provided by merchants partnered with Gojek.

Based on data from Bank Indonesia, there are already 38 e-wallets that have received official licenses. Besides Gopay, there are still several other mobile wallets that are quite popular in Indonesia such as OVO, LinkAja, Dana, Jenius, and so forth. In 2018, e-wallet transactions in Indonesia reached US$1.5 billion and it is predicted to increase to US$25 billion in 2023 (CNBC Indonesia, 2019).

2.2 Technology acceptance model

TAM (Davis, 1989) provides a conceptual framework for technology adoption based on theory of reasoned action (TRA) and theory of planned behaviour (TPB) (Ajzen, 1991). Davis (1989) developed TAM to model the acceptance of information systems which is represented by the intention to use variable, while the factors that drive the intention are represented by attitude, PU, and perceived ease of use variables. Attitude describes the user's general impression of a technology, while PU and perceived ease of use describe the person believes that the technology is useful and easy to use or not. TAM has been adopted for modelling user acceptance in various contexts such as mobile-based agricultural extension service (Verma and Sinha, 2018), big data analytics (Verma et al., 2018), healthcare (Razmak and Bélanger, 2018), and so on.

2.3 Perceived usability

Davis (1989) stated that usability illustrates the extent to which a person believes that using a particular system does not require effort. Furthermore, according to ISO 9241-11 definition, usability is: "the extent to which a product can be used by specified users to

achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use." Thus, usability in the context of a specific technology (e.g., website or application) refers to the ease of use of the technology.

A usable interface has three main outcomes (Interaction Design Foundation, 2019), namely:

1 It should be easy for the user to become familiar with and competent in using the user interface during the first contact with the website.

2 It should be easy for users to achieve their objective through using the website.

3 It should be easy to recall the user interface and how to use it on subsequent visits.

Usability plays an important role in the success of a technological innovation. Apple Music for example failed because of usability issues, even though it was supported by Apple's, a world class company. The same results were also shown by Lacka and Chong (2016) and Scholtz et al. (2016) who showed the important role of usability in the adoption of business to business (B2B) marketing and SAP ERP.

2.4 Perceived enjoyment

Enjoyment illustrates the pleasure of a user when using the technology (Davis et al., 1992). PE is the user's perception of the pleasure obtained from using the application (Nguyen, 2015). Various studies on PE have shown that user's comfort when using an application significantly influence their intention to use the application (Hussain et al., 2016). PE is used to determine the comfort of users when using Gopay.

3 Hypotheses development

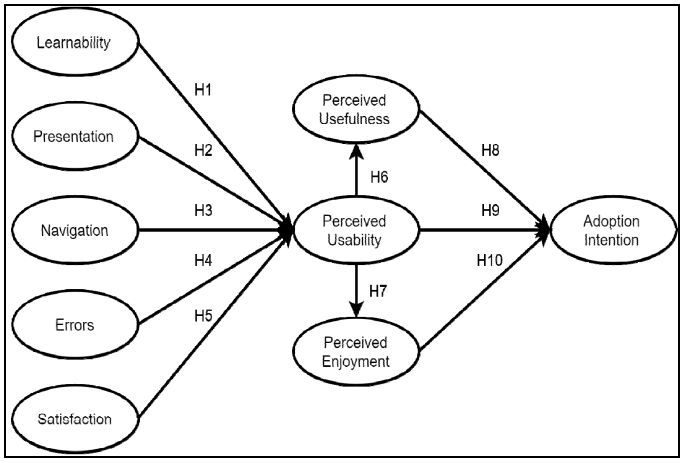
TAM (Davis, 1989) assumes that attitudes toward behaviour, influence the user's desire to use certain technologies. This model serves as the main framework applied in this study with the aim of discovering the intention of users towards the use of a mobile wallet. The original TAM framework shows that the user's perception of the benefits (PU) and the user's perception of the ease of use of technology will influence the user's behaviour towards the technology, which will affect the user's intention to use the technology (Ha and Stoel, 2009). The TAM framework is becoming a key theory underlying this research. We replaced the term perceived ease of use by PUS, as by definition both terms have the same meaning. The PUS is the end result of perceived ease of use (Davis, 1989).

Hussain et al. (2016) have conducted research on user's acceptance of mobile maps using TAM with the addition of PE to the research model. This addition was made because there have been studies (e.g., Davis et al., 1992; Igbaria et al., 1995) which found that the perception of comfort has a great influence on the intention of users to use a technology. Thus, we also included PE as a construct in the mobile wallet adoption.

By drawing conclusions from previous studies using the TAM, we formulated a research model as shown in Figure 1. The model shows five factors that influence the user's PUS when using mobile wallet, namely: learnability, presentation, navigation, errors, and satisfaction. Furthermore, users' PUS of mobile wallet influences the users'

PU and PE in using mobile wallet. Together, PUS, PU, and PE of using mobile wallet will affect users' intention to use mobile wallet [adoption intention (AI)].

Figure 1 Conceptual model



Below are the rational of each hypothesis in our conceptual model.

3.1 Antecedents of PUS

PUS is the perception held by users of the easiness of a technology. According to Nielsen (1993), Scholtz et al. (2016) and Lacka and Chong (2016) the factors that affect PUS are learnability, presentation, navigation, errors, and the level of user satisfaction with the technology.

Nielsen (1993) revealed that when users are at ease in using a technology, then the users will feel productive when using that technology. This is also proven by Scholtz et al. (2016) who showed the role of PUS in ERP systems adoption. When users find it easy to learn a technology and do not experience any difficulties in operating the technology, then they will tend to accept the technology, including Gopay as the case of this study. The increase in productivity experienced by users could affect user's perceptions towards the usability of Gopay for making payment. Thus, we posit the following hypothesis:

H1 Ease of learning (learnability) in the use of Gopay has a positive effect on its usability.

The second dimension of PUS is the presentation of the technology. The presentation criteria refer to ISO: 2001 which include colour selection, graphics and so on. Scholtz et al. (2016) found that presentation is an important factor affecting technology usability. This is because a technology that has a good presentation will reduce the possibility of users having difficulties in understanding the technology. If the presentation of the system is not well designed, this will lead to complications in using technology. Thus, it can be said that the presentation can affect the users' PUS of Gopay. With a good presentation, users will feel that Gopay is usable. Based on this, we posit the following hypothesis:

H2 Gopay presentation has a positive effect on its usability.

Poor navigation technology could lead into a misunderstanding and confusion to users (Matthews, 2008). Moreover, it could decrease the intention of users to use the technology. According to Maurizio and Rosemann (2005) navigation of a system must be always improved in order not to create confusion to users. In the context of Gopay, navigation is also important as users use a mobile device, which is smaller in size than a typical computer/laptop. When making a payment, users usually go through some pages, thus navigating from one page to another page may cause a problem if it is not efficient. Thus, when the navigation of Gopay is efficient, users will feel that Gopay has a good usability. Therefore, we formulate the following hypothesis:

H3 Gopay navigation has a positive effect on its usability.

It is almost impossible for a technology not to contain any errors or 'bugs' in the software context. The errors refer to the problems found by users when using a technology. According to Nielsen (1993), when a user makes a mistake when using technology and causes a problem, the problem must be easily resolved by the user so that the user can still do what he wants to do. However, Nielsen (1993) also stressed that although there is still a possibility of mistakes, its occurrence should not arise big problems. Thus, a good technology must be able to eliminate the possibility of users making mistakes that can trigger big problems. Similarly, Gopay should ensure that it has minimal errors as it may cause the users to feel unsecure with their money. When something wrong happens unexpectedly in the Gopay application, it should enable a fast recovery so that the users can continue performing their tasks. The fewer errors occur with the Gopay application, the higher the usability of the application since avoiding problems is a human nature (Scott, 1978). Based on the above arguments, the following hypothesis is formulated:

H4 Occurrence of errors while using Gopay has a negative effect on its usability.

Nielsen (1993) revealed that the perception of usability is also influenced by the level of user satisfaction when using the technology. This statement is also supported by Venkatesh et al. (2012) who state that the level of satisfaction is one of the criteria that mostly determines the user's PUS. In fact, users will be more likely to perceive a technology is useful if the user feels good and satisfied when using it. When Gopay users feel satisfied, they will tend to use it again and consider it as an easy-to-use application. Therefore, we propose the following hypothesis:

H5 User satisfaction with Gopay has a positive effect on its usability.

3.2 The relationship of PUS, PU, PE and the intention to use

PU refers to how users believe that the technology will improve his job performance (Davis, 1989). Furthermore, TAM also postulates a positive relationship between the perceived ease of use of a technology and the PU (Davis, 1989). This is because an easy-to-use technology will make the users perform their task better, thus increasing their productivity. This relationship was also supported by the finding of study by Lacka and Chong (2016) that showed the PU as an end result of perceived ease of use. Thus, the easier to use Gopay, the faster the users in performing their payment using Gopay. Thus, we present the following hypothesis:

H6 PUS of Gopay has a positive influence on its PU.

PE refers to users' feeling of happiness and comfort when using technology (Davis, 1992). When users find a technology easy to use, they will enjoy using the technology. Gopay as a mobile-based application is run on a mobile device with limited capabilities compared to desktop/laptop. Mobile device is considered as a media for leisure, although it may also be used for doing daily routines such as checking emails, etc. When performing a payment transaction and the users can complete their task efficiently, they will enjoy using Gopay as they can continue to perform other tasks including hedonic tasks such as browsing, etc. Indeed, the PE is a critical factor for users to continually use a technology. Based on the above explanations the following hypothesis is formulated:

H7 Perceived ease of use in using Gopay has a positive influence on its PE.

PU is a belief that a user will obtain benefits when using a technology (Davis, 1989). By using Gopay, users will be able to perform various financial functions such as paying food and ride hailing services without any need to bring cash. By using Gopay, users also do not need to pay with the exact amount of money, which is usually requested by the sellers. Thus, Gopay will offer some benefits that traditional payment cannot offer. The larger the benefits offered by the technology, the higher the possibility to adopt the technology. The same argument also applies when Gopay is easy to use. The easier the technology, the lesser the users' effort in learning the technology. Thus, the chance for the users to adopt the technology is higher. TAM and UTAUT show the positive impacts of PU and PUS on AI, that have also been supported by other studies such as Adapa et al. (2018), Hansen et al. (2018), Alalwan et al. (2018), etc. Therefore, we postulate the following hypotheses:

H8 PU of Gopay has a positive influence on the AI.

H9 PUS of Gopay has a positive influence on the AI.

Previous research also showed that PE greatly influenced users' intention in using a technology (Alalwan et al., 2018). The more comfortable the users are when using Gopay in payment, the higher the users' intention to use Gopay as a means of payment. Conversely, if users feel uncomfortable when using Gopay in payment, it will decrease the intention to use Gopay. Thus, we posit the following hypothesis:

H10 PE of users towards Gopay has a positive effect on the AI.

4 Research methodology

4.1 Research instrument

This research employs survey research method by distributing an online questionnaire. The questionnaire was distributed through social media with research indicators as presented in Table 1. The questionnaire was developed based on previous similar studies and has gone through face and content validity to ensure its validity and reliability. We used five-point Likert scales to capture respondent's agreement to the provided statements, where 1 indicates strongly disagree and 5 indicates strongly agree. The questions in the questionnaire were pilot tested with five respondents of Gopay users. The

results of completed questionnaire were then evaluated. We revised the contents of the questionnaire in terms of improving sentence structure, rephrasing long sentences and removing inconsistencies, which enhanced the readability and the overall quality of the questionnaire.

Table 1 Questionnaire indicators

Variable	*Code*	*Questions*	*Reference*
Learnability (LER)	LER1	I need a long time to learn how to use Gopay	Scholtz et al. (2016)
	LER2	I can easily find features that I will use on Gopay	
	LER3	I can easily learn the Gopay feature by looking at the initial tutorial given in the Gopay application	
Presentation (PRES)	PRES1	I like the outline of the Gopay page	Scholtz et al. (2016)
	PRES2	I feel the information provided by Gopay is complete	
	PRES3	I feel the information provided by Gopay is clear	
	PRES4	I feel the information provided by Gopay is accurate	
	PRES5	I feel the information provided by Gopay can be easily understood	
	PRES6	I feel the arrangement of the menu displayed by Gopay is well structured	
Navigation (NAV)	NAV1	I can easily access the information I need on Gopay	Scholtz et al. (2016)
	NAV2	I can find the Gopay feature that I will use quickly and easily	
	NAV3	I feel the displayed icon on the Gopay already explains the function of the icon	
	NAV4	When using the Gopay menu, I feel the menu functions are meet my expectations	
Error (ERR)	ERR1	I rarely experience problems when using Gopay	Nielsen (1993)
	ERR2	I have never experienced errors when using Gopay	
	ERR3	When I find a problem in using Gopay, I can easily find a solution to that problem	
Satisfaction (SA)	SA1	I am satisfied with the services provided by Gopay	Lacka and Chong (2016)
	SA2	I am satisfied with the way Gopay processes my payment transaction	
	SA3	Overall, I am satisfied with Gopay	
Perceived usefulness (PU)	PU1	I feel that the payment process becoming easier when using Gopay	Davis (1989)
	PU2	I feel that by using Gopay, I can process transactions through mobile applications faster (for example: buying tickets for transportation, buying cinema tickets, shopping coupons, etc.)	
	PU3	I feel that using Gopay can speed up the payment process	
	PU4	I feel that Gopay will be very useful for me	

Table 1 Questionnaire indicators (continued)

Variable	*Code*	*Questions*	*Reference*
Perceived usability (PUS)	PUS1	I feel that Gopay is easy to use for the payment process	Davis (1989)
	PUS2	I find it easy to be skilled using Gopay	
	PUS3	I feel it is easy to learn Gopay	
Perceived enjoyment (PE)	PE1	I feel that Gopay makes the payment process more enjoyable	Balog and Pribeanu (2010)
	PE2	Overall, I enjoy making payments with Gopay	
	PE3	Overall, I find Gopay interesting	
Adoption intention (AI)	AI1	I intend to use Gopay as often as possible	Sayyahgilani et al. (2014)
	AI2	I intend to increase the frequency of using Gopay	
	AI3	I intend to use Gopay for all my payment transaction	
	AI4	I think I will always use Gopay for my payment transaction	

4.2 Data collection procedure

The questionnaire for this research was prepared using Google Forms. The questionnaire was then distributed through social media to reach out to the respondents. We limited the respondents to those who have used Gopay either for payment transactions, for paying services provided by Gojek, or services provided merchants affiliated with Gojek. To maintain the privacy of the respondents, we kept the respondents anonymous, except those who wanted to participate in a draw to win prizes. We provided ten pre-paid mobile phone vouchers worth IDR500,000 – to the winners. The survey lasted two weeks, from 20 April to 3 May 2019.

4.3 Data analysis method

The data was processed and analysed using structural equation modelling (SEM), which is a very popular tool for information systems research (Roberts and Grover, 2009). We selected partial least squares (PLS)-based SEM (PLS-SEM), a variance-based approach SEM to test the relationship between variables in the hypotheses (Hair et al., 2011). PLS-SEM is suitable for small sample size data.

According to Hair et al. (2011), the data processing through PLS follows two steps of processing. First, we perform measurement model evaluation to particularly investigate the reliability and discriminate validity of constructs. Second, we evaluate the structural model by examining the significance level of path coefficients to test the hypotheses (Vinzi et al., 2010). We used SmartPLS version 3.0 software to help processing our data. For the bootstrapping, we follow the recommendations of Chin (2010), by taking 5,000 resample to determine the significance levels of loadings, weights, and path coefficients.

5 Results and discussion

5.1 Demographics of respondents

A summary of the respondents' demographics can be seen in Table 2, consisting of age, sex, occupation and Gopay usage information for each respondent. The yes-no question were used to get information about the use of Gopay. If the respondent answered 'no' then the respondent would not continue filling the questionnaire. Questions regarding information about Gopay usage were grouped into frequency of using Gopay, the need to use Gopay, and the most commonly used Gopay feature. At the end, we obtained 200 respondents' data with 167 valid data. There were 33 invalid data because respondents never used Gopay or the data provided by respondents were invalid and contained outliers.

Our respondents were 67.5% female and 32.5% male with 71% were in the age range between 20–24 years, 14.5% aged 15–19 years, 7.5% aged 30–40 years, 4.5% aged >40 years, and 0.5% are <15 years old. The majority of the respondents in this study were students (75.5%), while 16.5% were employees. The duration of Gopay usage by respondents varied evenly between <3 months to <2 years. Respondents usually use Gopay for two main purposes, namely paying Gojek services (98.9%) and paying for shopping at outlets (47.5%). While the most frequently used features are the pay feature (86.9%) and top up balance (61.2%). Other features that are also commonly used are vouchers (22.4%), pulses (20.8%), and history (14.2%).

Table 2 Respondents' demography

Age		
Age	*Amount*	*Percentage*
<15 years	1	0.5%
15–19 years	29	14.5%
20–24 years	142	71%
25–29 years	4	2%
30–40 years	15	7.5%
>40 years	9	4.5%
Sex		
Sex	*Amount*	*Percentage*
Man	65	32.5%
Woman	135	67.5%
Occupation		
Occupation	*Amount*	*Percentage*
University student	151	75.5%
Worker	33	16.5%
Student	6	3%
Teacher	3	1.5%
Others	7	3.5%

Table 2 Respondents' demography (continued)

Have ever used Gopay		
Answer	*Amount*	*Percentage*
Yes	183	91.5%
No	17	8.5%
Period of using Gopay		
Period	*Amount*	*Percentage*
<3 months	7	3.8%
3–6 months	19	10.4%
6–12 months	43	23.5%
1–2 years	61	33.3%
>2 years	51	27.9%
Others	1	0.5%
Frequency on using Gopay		
Frequency	*Amount*	*Percentage*
Very often	32	17.5%
Often	77	42.1%
Neutral	43	23.5%
Rare	22	12%
Very rare	8	4.4%
Others	1	0.5%
Reasons for using Gopay (multiple answer)		
Reason	*Amount*	*Percentage*
Paying for Gojek services	181	98.9%
Paying at the outlet	87	47.5%
Paying debt	1	0.5%
Balance transfers	1	0.5%
Gopay discount	1	0.5%
Others	3	1.5%
Frequently used features in Gopay (multiple answer)		
Frequently	*Amount*	*Percentage*
Payment	159	86.9%
Nearby	16	8.7%
Balance top up	112	61.2%
Asking	6	6%
History	26	14.2%
Withdraw	4	2.2%
Voucher	41	22.4%
Billing	11	6%
Phone credit	38	20.8%

Table 3 Measurement model evaluation testing results (see online version for colours)

Parameter	*Loading factor (>0.70)*	*CR (>0.70)*	*CA (>0.70)*	*AVE (>0.50)*
L1	0.725	0.830	0.691	0.619
L2	0.822			
L3	0.811			
P1	0.766	0.907	0.876	0.620
P2	0.847			
P3	0.850			
P4	0.693			
P5	0.821			
P6	0.735			
N1	0.848	0.910	0.869	0.717
N2	0.839			
N3	0.818			
N4	0.881			
E1	0.813	0.827	0.685	0.615
E2	0.809			
E3	0.727			
S1	0.867	0.912	0.856	0.776
S2	0.864			
S3	0.912			
PU1	0.835	0.897	0.848	0.686
PU2	0.798			
PU3	0.837			
PU4	0.844			
PUS1	0.854	0.871	0.777	0.693
PUS2	0.764			
PUS3	0.874			
PE1	0.865	0.916	0.863	0.785
PE2	0.904			
PE3	0.889			
AI1	0.855	0.925	0.892	0.755
AI2	0.889			
AI3	0.841			
AI4	0.890			

5.2 Measurement model evaluation results

The measurement model test is intended to assess the validity and reliability of indicators. This measurement refers to the results of calculations on loading factor, composite reliability (CR), Cronbach's alpha (CA) and average variance extracted (AVE). CR is a

measure of internal consistency of the indicators that make up a variable. CR calculation aims to test convergent validity and reliability in the reflective model. The value of CR must be greater than 0.7 for the requirements of the study (Hair et al., 2011). CA aims to test the reliability of the indicator with the latent variable represented. The value for CA must be greater than 0.6 so that it can be classified on a good scale. AVE is used to test the convergent and divergent validity. For this study, the AVE must be greater than 0.5 (Hair et al., 2011).

Based on the results of testing the measurement model on 167 questionnaire data, one indicator does not meet the loading factor requirements, which is the P4 indicator from the latent variable presentation. The value of loading factor is only 0.693, which is less than 0.7. Therefore, to ensure the data used in this study passed the validity and reliability test, the P4 indicator was dropped. After dropping the P4 indicator, the measurement model test was performed again on the data. The results of the second measurement model test show no indicators that are below the threshold. Likewise, the CA, CR, and AVE values all meet the requirements. Thus, data processing can proceed to the structural test model. Table 3 presents the values from the measurement model calculation.

5.3 Structural model evaluation testing results

Structural model testing aims to assess the validity of research hypotheses by comparing the p-value to the level of significant of 5%. This study uses a 95% confidence interval with the one tail hypothesis test method. The structural test results of the model can be seen in Table 4, where of the ten hypotheses proposed there are six hypotheses that have been accepted, namely H1, H5, H6, H7, H8 and H10, at either 1% or 5% level of significance.

Table 4 Structural model evaluation testing results

Hypothesis				*O*	*M*	*Stdev*	*T stat*	*P value*	*Conclusion*
H1	LER	→	PUS	0.243	0.239	0.075	3.252	0.001	Accepted
H2	PRES	→	PUS	0.134	0.137	0.101	1.328	0.092	Rejected
H3	NAV	→	PUS	0.115	0.156	0.118	1.313	0.095	Rejected
H4	ERR	→	PUS	0.061	0.068	0.090	0.684	0.247	Rejected
H5	SA	→	PUS	0.190	0.187	0.087	2.173	0.015	Accepted
H6	PUS	→	PU	0.845	0.845	0.026	33.127	0.000	Accepted
H7	PUS	→	PE	0.709	0.711	0.043	16.675	0.000	Accepted
H8	PU	→	AI	0.228	0.226	0.120	1.901	0.029	Accepted
H9	PUS	→	AI	0.162	0.156	0.128	1.267	0.103	Rejected
H10	PE	→	AI	0.326	0.334	0.092	3.537	0.000	Accepted

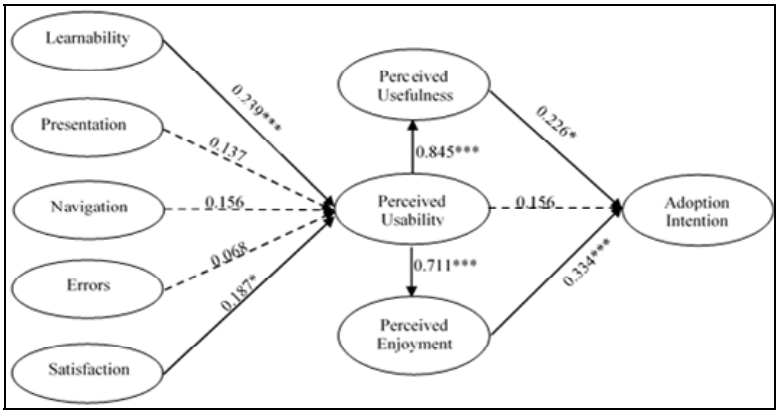
Table 5 shows the calculation results of the coefficient of determination that illustrates how capable all the independent variables in explaining the variance contained in the dependent variable. The coefficient of determination can explain the structural strength of the model being build. R^2 and adjusted R^2 show the goodness of the proposed model. The R^2 and adjusted R^2 values as shown in Table 5 appear to be medium to strong. In this study there are two models that are classified as strong namely PU which is R^2 0.714 and

adjusted R^2 0.712 and PE with R^2 0.503 and adjusted R^2 0.500. While the models that are classified as medium are AI with R^2 0.423 and adjusted R^2 0.412 and PUS with R^2 0.381 and adjusted R^2 0.362. Thus, for variables with medium R^2, it means that there is still an opportunity to see other factors that explain these variables. The AI variable is not only determined by the technological-related factors, but also non-technology factors which were not included in this research. Our final model can be seen in Figure 2.

Table 5 Determination coefficient of the proposed model

Latent variable	*R square*	*R square adjusted*	*Power*
AI	0.423	0.412	Medium
PU	0.714	0.712	Strong
PUS	0.381	0.362	Medium
PE	0.503	0.500	Strong

Figure 2 Final model



Notes: *P < 0.05, **P < 0.01, ***P < 0.001.
——→ – accepted and - - - - - - - → – rejected.

5.4 Discussion and implications

This study aims to fill the gap from previous research by analysing the factors that influence the adoption of mobile wallet in Indonesia from the PUS perspective. Based on the results of data analysis, we found two main factors driving perceive usability, namely are learnability and satisfaction. Of the two influencing factors, the learnability factor has a greater coefficient, which means that the usability level of a mobile wallet is mostly influenced by the ease of learning the application. This is in line with the findings from Nielsen (1993) and Scholtz et al. (2016) which showed the important role of the ease of learning of a technology on user productivity.

Interestingly, our findings show that three other factors: presentation, navigation, and errors do not impact PUS significantly. These findings contradict some of the results of previous studies assessing different technologies. For example, in the context of ERP adoption, Matthews (2008), Nielsen (1993) and Scott (1978) consistently showed that

navigation, errors, and presentations are closely related to usability, which in turn can affect users' intention in adopting an ERP system. Today, mobile technology has become a way of life for humans since we use various mobile devices so frequently in our daily lives. Usability factors such as presentations, errors, and navigation seem to be no longer an important issue for users, especially with the current programming technology that allows the creation of applications that are robust, error free, and have an attractive appearance. Thus, it makes sense if the usability factor in the context of a mobile wallet is only influenced by the ease of learning and satisfaction, because the ease of learning is usually the first barrier that users will face when they decide to adopt a new technology.

This study also revealed direct factors that have impacts on user intention to adopt mobile wallet, which include PE and PU. Our findings further showed that mobile wallet adoption is influenced indirectly by PUS though PE and PU. Our findings are slightly different from the findings of Lacka and Chong (2016) which showed that PUS can directly influence AI to adopt social media site in the B2B context. In addition, the results of this study showed that the most important factor influencing the intention to adopt mobile wallet was PE. The extensive use of mobile devices in our daily life, makes users no longer having difficulties in using the mobile wallet application, since it is not different from using other mobile applications. This seems to be a plausible explanation for why in many cases of mobile technology adoption, the PUS (ease of use) factors did not influence the intention to adopt a technology (Chong et al., 2010), whereas PU and PE are two factors that directly influence intentions in adopting a mobile wallet. PU is related to the benefits obtained by users. With the various advantages provided by mobile wallet compared to conventional payment method, users will certainly be more interested in using a mobile wallet. As part of the activities carried out every day by humans, the PE must also be the most critical driving factor for adoption, because mobile devices are now the main source of humans in obtaining hedonic satisfaction.

The results of this study offer theoretical and practical contributions. From the theoretical perspective, this research provides an insight into the roles of PUS in mobile wallet acceptance, which is still lacking in the literature. Our research showed the indirect effect of PUS on mobile wallet acceptance through PU and PE. Thus, we advanced the literature which is currently dominated by TAM and UTAUT. From the practical perspectives, our findings provide several practical insights to mobile wallet developers and providers. First, as the learnability is the strongest predictor of PUS, the developers should ensure that mobile wallet they developed is easy to learn. The developers can supply a wizard or brief tutorial to the prospective users on how to use the mobile wallet. Also, as satisfaction becomes an antecedent of PUS, the mobile wallet providers should ensure that the service they offered satisfied mobile wallet users. Indeed, service quality is a main source of users' satisfaction. Furthermore, as the users consider PU as the driver of mobile wallet adoption, the mobile wallet providers can add other features, in addition to paying for goods or services. Features such as funds transfer to other mobile wallet users, bills payment, parking payment, etc. may add value to the mobile wallet.

6 Conclusions

This study aims to analyse and find the relationship of PUS and AI of mobile wallet, with Gopay Indonesia as our case study. This study found two important drivers of PUS in mobile wallets which are learnability and satisfaction, with learnability as the main

antecedent of PUS. Furthermore, our research showed that PUS does not directly affect users' intention to adopt mobile wallet. PUS influences mobile wallet adoption indirectly through PU and PE. Our findings advance the current literature on mobile wallet adoption that mostly uses TAM and UTAUT as the theoretical lenses.

Our study also has limitation, as we did not cover both rural and urban respondents. In the future, some potential studies could be undertaken to improve our current understanding on mobile wallet adoption factors, particularly in the developing countries. Considering the digital gap between rural and urban people, it would also be interesting to compare factors driving mobile adoption in the rural and urban contexts. Indeed, the biggest challenge is introducing mobile wallet technology to rural people. The role of social influence is also worth investigating. Social influence in the forms of electronic word-of-mouth (e-wom) proved to have an impact on the acceptance of new service innovation in Indonesia (Hidayanto et al., 2017).

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