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**A MODEL OF CONSUMERS' CONTINUED INTENTION OF USING
E-WALLET IN INDONESIA**

CITRA NOVIYASARI



**DOCTOR OF PHILOSOPHY
UNIVERSITI UTARA MALAYSIA
2025**



Awang Had Salleh
Graduate School
of Arts And Sciences

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Prof. Ts. Dr. Faaizah Shabodin

Tandatangan
(Signature)

Pemeriksa Dalam:
(Internal Examiner)

Assoc. Prof. Dr. Zahurin Mat Aji @ Alon

Tandatangan
(Signature)

Nama Penyelia/Penyelia-penyelia:
(Name of Supervisor/Supervisors)

Prof. Dr. Huda Hj. Ibrahim

Tandatangan
(Signature)

Nama Penyelia/Penyelia-penyelia:
(Name of Supervisor/Supervisors)

Assoc. Prof. Dr. Mohd Khairudin Kasiran

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Abstrak

Perkembangan e-dompet di Indonesia adalah perlahan disebabkan oleh kepercayaan yang rendah terhadap keselamatan transaksi, penerimaan peniaga yang terhad terhadap pembayaran e-dompet dan kos transaksi. Walaupun kerajaan Indonesia menggalakkan peralihan daripada pembayaran tunai kepada pembayaran tanpa tunai, kajian diperlukan untuk mengenal pasti faktor yang menggalakkan penggunaan e-dompet secara berterusan. Kajian ini bertujuan untuk menentukan sama ada niat berterusan untuk menggunakan e-dompet akan membawa peralihan daripada pembayaran tunai kepada pembayaran tanpa tunai. Ia juga mengkaji sama ada kepercayaan merupakan faktor utama yang mempengaruhi penggunaan e-dompet secara berterusan. Peningkatan kepercayaan dapat dicapai melalui kempen promosi, memudahkan peniaga dalam menyediakan peranti e-dompet dan menawarkan pelbagai insentif. Kajian ini menggunakan Expectation-Confirmation Model (ECM) sebagai model asas untuk mengkaji faktor yang mempengaruhi hasrat untuk menggunakan e-dompet secara berterusan. Model ini menggabungkan beberapa konstruk yang lain seperti kepercayaan, penerimaan secara meluas, insentif, tanggapan keamanan, dan tabiat, yang boleh meningkatkan penggunaan e-wallet. Kajian ini menggunakan pendekatan kuantitatif-positivis, dengan data dianalisa menggunakan *Partial Least Squares-Structural Equation Modeling* (PLS-SEM) untuk mengesahkan model. Secara keseluruhan, model ini menunjukkan kesesuaian yang baik dengan data yang dikutip. Dapatan menunjukkan bahawa kepercayaan dan kepuasan adalah peramal penting niat untuk terus menggunakan e-dompet. Menariknya, kebergunaan yang dirasakan bukanlah faktor dominan kerana responden mempunyai pengalaman yang berbeza, dengan sesetengahnya tidak mempunyai pendedahan terdahulu kepada penggunaan e-dompet. Hasrat penggunaan semula e-dompet boleh membentuk tabiat orang ramai untuk mengurus niaga menggunakan e-dompet. Secara teorinya, kajian ini dapat memperluas penggunaan e-dompet dengan meningkatkan kepuasan dan kepercayaan orang ramai apabila menggunakan e-dompet, seterusnya memupuk tabiat menggunakan e-dompet sebagai kaedah pembayaran. Secara praktikalnya, kajian ini menawarkan penyedia e-dompet tentang faktor yang boleh meningkatkan penggunaan e-dompet pada masa hadapan. Akhir sekali, kajian ini menyumbang untuk menyokong dasar kerajaan ke arah masyarakat tanpa tunai.

Kata Kunci: E-dompet, Kepercayaan, Niat Berterusan, Keselamatan, Tabiat

Abstract

The development of e-wallets in Indonesia has been slow due to low trust in transaction security, limited merchant acceptance of e-wallet payments and transaction costs. Although the Indonesian government is promoting a shift from cash to cashless payments, studies are needed to identify the factors that encourage continued e-wallet use. This study aims to determine whether the continued intention to use e-wallets will result in a shift from cash to cashless payments. It also examines whether trust is a key factor influencing continued e-wallet use. Increased trust is achieved through promotional campaigns, facilitating merchants' provision of e-wallet devices, and offering various incentives. This study adopts the Expectation-Confirmation Model (ECM) as a foundational model to investigate the factors influencing the intention to continue using e-wallets. This model integrates several constructs, such as trust, wide acceptance, incentives, perceived security, and habits, which are deemed to increase the use of e-wallets. This study uses a quantitative-positivist approach, with data analysed using Partial Least Squares-Structural Equation Modeling (PLS-SEM) to validate the proposed model. Overall, the model shows a good fit with the data collected. The findings reveal that trust and satisfaction are significant predictors of the intention to continue using e-wallets. Interestingly, perceived usefulness is not a dominant factor, likely due to varying levels of user experience among respondents, with some lacking prior exposure to e-wallet usage. The continued intention to use e-wallets can shape people's habits to transact using the e-wallet. Theoretically, this study contributes to the continuance of e-wallet usage by highlighting the importance of enhancing public satisfaction and trust, which, in turn, fosters habitual usage. Practically, this study provides valuable insights for e-wallet providers into key factors that can increase the use of e-wallets in the future. Additionally, this study supports government initiatives towards a cashless society.

Keywords: E-wallet, Trust, Continued intention, Security, Habit

Acknowledgement

“La hawla wa la quwwata illa billah”: There is no power nor might except with Allah. Alhamdulillah, my heartfelt gratitude and thanks to Almighty Allah S.W.T. for giving me opportunity and strength throughout this journey and acquire knowledge which comes with lots of blessings from Allah.

My sincere thanks and profound sense of appreciation goes to my supervisors for the sustain support of my study. For Prof. Dr. Huda Bt Haji Ibrahim, your knowledge, tolerance, and guidance helped me to complete this study and thesis writing. Special thanks to Associate Prof. Dr. Mohd Khairudin Bin Kasiran for being a great co-supervisor, for his insightful comments and encouragements. Only Allah could repay everything and shower with countless blessing on you and your family. All academic and non-academic staff of both School of Computing and Awang Had Salleh College of Arts & Sciences. It is equally pertinent to appreciate and acknowledge the Universiti Utara Malaysia. Not forgetting Universitas Komputer Indonesia (UNIKOM) for providing me with the scholarship for this research work. I am highly grateful.

Deep in my heart, special appreciation to my late father for his moral upbringing and support, and my beloved mother, brothers, and sister, for the countless support and understanding for all the time. For my big family, this is especially for all of you. Last but not least, special thanks to all my colleagues for the morale and practical support during the tough moments of this journey

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List of Abbreviations

APJII	Asosiasi Penyelenggara Jasa Internet Indonesia
ATM	Automation Teller Machine
AVE	Average Variance Extracted
BI	Bank Indonesia
BPS	Badan Pusat Statistik
CI	Continued Intention
Co	Confirmation
CR	Composite Reliability
DKI	Daerah Khusus Ibukota
DI	Daerah Istimewa
ECM	Expectation Confirmation Model
ECT	Expectation Confirmation Theory
Ha	Habit
HTMT	Heterotrait-Monotrait ratio of correlation
In	Incentives
IPBS	Indonesian Payment Blueprint Scheme
KIC	Katadata Insight Center
IPS	Indonesian Payment System
MNO	Mobile Network Operator
NFC	Near-Field Communication
PBI	Peraturan Bahasa Indonesia
PC	Personal Computer
PLS-PM	Partial Least Square-Path Modelling
PLS-SEM	Partial Least Square-Structural Equation Modelling
QR	Quick Response
QRIS	Quick Response Indonesian Standard
RFID	Radio Frequency Identification
Sa	Satisfaction
Sc	Perceived Security
SEM	Structural Equation Modelling
TAM	Technology acceptance model
TPB	Theory of Planned Behaviour
Tr	Trust
TRI	Technology readiness index
UNIKOM	Universitas Komputer Indonesia
UPNV	Universitas Pembangunan Nasional Veteran Jakarta
Us	Perceived Usefulness
USAID	United States Agency for International Development)
UTAUT	Unified Theory and Acceptance Use of Technology
VIF	Variance Inflation Factor
Wa	Wide Acceptance

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Developing and implementing the latest Information Technology in the banking system has changed the monetary transactions platform. Currently, the value of money can be transferred digitally, and digital money is starting to be accepted in the market (Hamzah et al., 2023; Humbani & Wiese, 2019). The banking world has created the automatic teller machine (ATM) plastic cards, where information regarding the amount of money received or spent can be stored digitally and linked to a certain database. Apart from using cards, currently, financial transactions can be carried out using cell phones. The e-wallet is an innovative payment system that can be used both offline and online (Chawla & Joshi, 2019; Hamzah et al., 2023; Phuong et al., 2020). Offline use of e-wallets is by using a smart card with a certain amount of funds, and the consumer will tap the card on a signal reader (Ghosh et al., 2017). The subsequent development involved the use of e-wallets via cell phones so that consumers can make payments by tapping the cell phone or scanning a barcode (Lim et al., 2022; Ondrus et al., 2015; Reuver & Ondrus, 2017). In Europe, the initial use of e-wallets in the mid-1990s was due to the desire to facilitate money exchange (Chandran & Pitchandi, 2020; Susanto et al., 2022), and reduce counterfeiting (Hove, 2004; Susanto et al., 2022).

The evolution from a cash-based economy to a digital or cashless economy has inevitably forced business entities to adhere to trust-based consumer relationship policies and security mechanisms in transactions (Undale et al., 2021). Consumer trust can affect the use of different payment systems. Consumers believe that financial

activities carried out online have a higher security risk than offline activities (Madan & Yadav, 2016); hence, they will be reluctant to make such transactions as long as there is no guarantee of security in online transactions. This sense of insecurity makes it inconvenient for consumers to transact online (Abbasi et al., 2022). Therefore, one of the requirements for increasing digital transactions is to establish a security scheme for online transactions. This scheme can increase consumers' sense of security when transacting online (Barkhordari et al., 2017).

Trust will encourage consumers to adopt new technology, and also influence consumers to use that new technology (Lonardi & Legowo, 2021; Wade & Robison, 2012). It is important to have trust, especially when using technology for the first time (Lu et al., 2011; Omotubora & Basu, 2018). If failure occurs when making a transaction, there is a possibility that consumers will no longer trust the technology. On the other hand, if failure does not occur, then trust will enhance continued usage. Trust involves risk and uncertainty because there is no control over technology, such as security problems in telecommunications infrastructure (Cao et al., 2018), especially if wireless methods are used to access the internet (Khanra et al., 2021; Nilashi et al., 2015). Perceived security will help in maintaining consumers' trust to have continued intention to transact online using their e-wallets.

The history of e-wallet usage evinces that when e-wallets were first introduced, people in developed countries showed initial resistance to e-wallets compared to developing countries (Migliore et al., 2022). An example is the case in the United States (US). Although the majority of the people know about e-wallets, they had never used e-wallets (Park et al., 2019). One of the reasons for this could be the perceived security

concerns. The ease of using e-wallets without a card and without verifying the account holder's signature is assumed to be a weakness of e-wallets that make them insecure to use (Park et al., 2019). There was a similar occurrence in European countries, where the slow penetration of e-wallets may have been due to the lack of added value as perceived usefulness by users, and the high cost of applications for micropayments (Apanasevic et al., 2016). On the other hand, there was a positive acceptance of using e-wallets in developing countries (Park et al., 2019). In developing countries, since banking services were not yet accessible by all levels of society, the existence of e-wallets provided an alternative for them to obtain banking services, potentially bridging the gap in financial inclusion (Ciptarianto & Anggoro, 2022). In addition, the lack of infrastructure in such countries enabled fund transfers using e-wallets for people who do not have bank accounts, thus making e-wallets a major mode for financial transactions (Apanasevic et al., 2016).

Currently, some merchants are starting to add e-wallets as their transaction instrument of choice, a move that could potentially bring them significant benefits. However, these merchants need to be able to prepare for the high investments involved (Ciptarianto & Anggoro, 2022; Widjaja & Tedjawidjaja, 2012). However, merchants face difficulties because there are a variety of e-wallet platforms. Different providers issue different e-wallets, and the community might have several kinds of e-wallets. It is a challenge to a merchant to provide several e-wallet platforms. For example, if merchants want to add e-wallet payment instruments, they must consider whether or not they provide all types of e-wallets. This is considered less profitable for consumers because e-wallets have limitations, one of which is the need to be able to transfer their

money balance among different e-wallet providers. Another limitation of e-wallets is that funds stored in e-wallets cannot be re-cashed (Sikri et al., 2019; Teng, 2018).

In Indonesia, e-wallets have been around since 2007, but have not received a positive response from the Indonesian population; in fact, very few people use e-wallets as a payment method. A United States Agency for International Development (USAID) report shows that less than 1% of the Indonesian population are using e-wallets. USAID believes using e-wallets can enable banking services to reach people who do not have bank accounts (USAID, 2011). In 2011, most people did not have access to banking services, and were mainly using cash (Evans & Pirchio, 2015). During the 2015-2018 period, the Bank Indonesia (BI) Report noted a steady rise in e-wallet transactions, increasing by 11% annually, a sign of the gradual but promising shift towards digital payments. However, this increase was considered less significant and could not replace cash and card payments (Bayunitri & Fajar, 2019). At that time, the government was still trying to socialise non-cash transactions and strengthen the telecommunications infrastructure.

In 2019, BI introduced Indonesia's payment blueprint for 2025. The blueprint has a new policy to cater to the challenges of the digital era. As a central bank, BI is fully responsible for maintaining a sound economic and financial structure for sustainable economic development. The digital revolution or the Industry 4.0 era requires BI to understand the shifting demands of society, opportunities, and risk dimensions in maintaining the quality of its banking services. The blueprint comprises five visions of the Indonesian Payment Systems (IPS) 2025, further translated into five major initiatives, and manifested into 23 key deliverables implemented in stages from 2019

to 2025. One of the initiatives is retail payment systems in the IPS Blueprint 2025, which aims at modernising the retail payment systems toward more efficient and secure infrastructures by utilising the latest innovations (Bank Indonesia, 2019), Payment services must be able to reach all layers of society in an easily accessible manner, so that e-wallets can widen financial inclusion for those who do not have access to banking services (Inggiharti, 2020).

Some Indonesians who live in rural areas do not have access to banking services, and so, the government is trying to provide alternatives. One method is through the amendment to BI Regulations regarding e-money. For example, in 2009, under amendment No. 11/12/PBI/2009, BI permitted banks and Mobile Network Operators (MNOs) to issue e-wallets; while under BI Regulation No. 18/17/PBI/2016, provisions for Digital Financial Services are available. The Regulation also protects consumers when they make e-monetary transactions. This change will likely encourage an increase in non-cash transactions, especially e-wallets. Non-cash transactions will reduce cash holdings, which will have an impact on reducing BI interest rates (Wasiaturrahma & Kurniasari, 2021). The cash transaction fee is about 5% of the amount the consumer must pay, including calculations for printing and destroying money (Wasiaturrahma & Kurniasari, 2021). Using e-wallets is expected to stimulate economic growth as it can enhance the speed of money circulation and streamline transactions, particularly for digitally-based sectors (Inggiharti, 2020).

This current study discusses the use of e-wallets from a consumer's perspective. An initial study has found that some parents have found that having an e-wallet made it easier for them to do things they could not do, such as ordering e-hailing and food,

where the payment process could be via their e-wallet. They also can easily transfer funds via e-wallet to their children. Besides that, they can get incentives offered by the e-wallet provider. VISA's Consumer Payment Attitudes Study 2022 report states that Gen Z uses e-wallets more often than other payment methods (Visa, 2022). This is in line with the Katadata Insight Center (KIC) study in 2019 which stated that Gen Z uses e-wallets more often than Gen Y (Zigi.id, 2021). KIC's study focuses on the comparison between Gen Z and Gen Y. Based on Badan Pusat Statistik (BPS) data, in 2023, the percentage of Gen Z in Indonesia was 27.94% of the total population (Badan Pusat Statistik Indonesia, 2023).

According to the 2023 Report by Asosiasi Penyelenggara Jasa Internet Indonesia (APJII), the highest internet penetration is on Java Island at 81.81%, which equals 175.9 million people. APJII is an association that organises internet operations in Indonesia, and its responsibility is to develop the internet network in Indonesia. Based on the BI report, there were 363.88 million total e-wallets in Indonesia in 2020, and in October 2023, there were 695.64 million e-wallets in circulation in Indonesia. This indicates that there has been an increase over the four years from 2020 to 2023. Furthermore, the highest total number of e-wallets is on Java Island, accounting for 97% in 2020, and decreasing to 91% by 2023. This indicates a growth in total number of e-wallets outside Java Island, especially in Bali, and big cities in Sumatra Island. The Java Island has six provinces: Banten, DKI Jakarta, West Java, Central Java, DI Yogyakarta, and East Java. The majority of e-wallet users on Java Island are the Gen Z (Angelina & Rahadi, 2020).

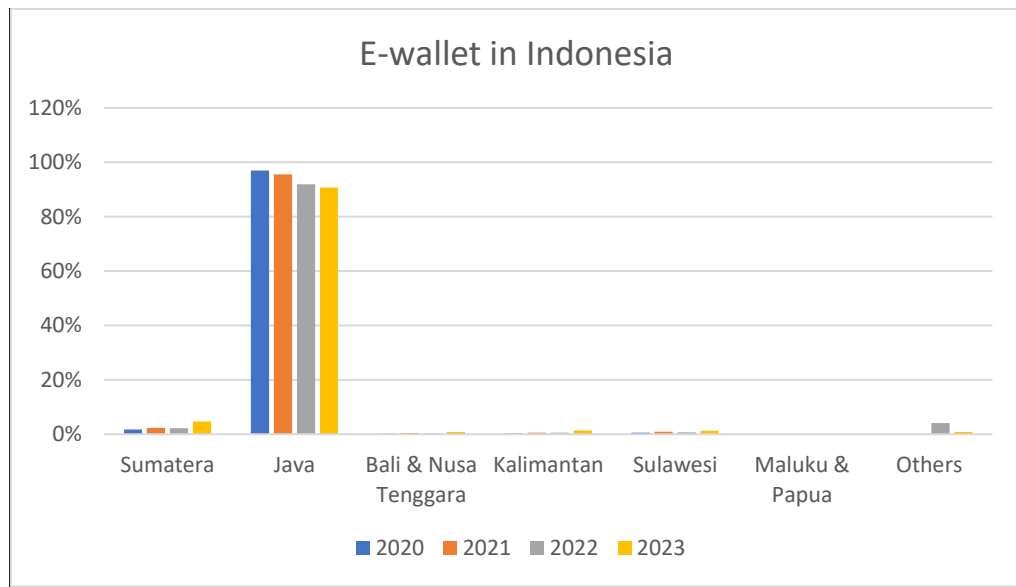


Figure 1.1 E-wallet in Indonesia

Source: Bank Indonesia

Apart from that, according to Astarina (2020), the highest use of e-wallets is in Jabodetabek at 18.38%, Surabaya at 14.37%, Palembang at 10.03%, Medan at 9.77%, Bandung at 7.69%, Semarang at 6.47 %, Yogyakarta at 4.90%, Padang at 3.75%, Makassar at 3.75%, Bali at 2.76%, and Pontianak at 2.57% (Astarina, 2020).

Jabodetabek is an integrated area in Banten, DKI Jakarta and West Java provinces. Jabodetabek is an abbreviation of Jakarta (Jakarta), Bogor, Depok and Bekasi (West Java), and Tangerang (Banten). Surabaya, Bandung, Semarang and Yogyakarta are big cities in Java.

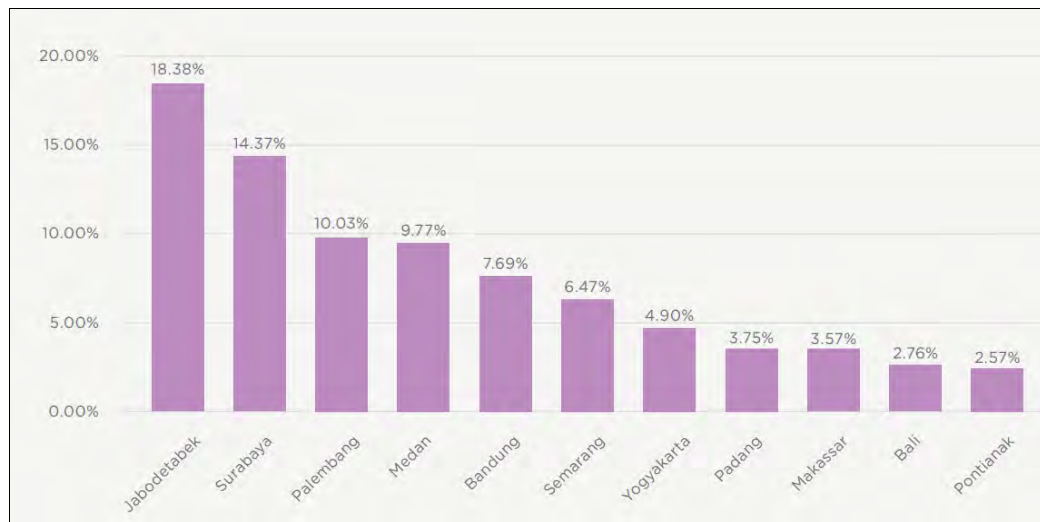


Figure 1.2 E-wallet Penetration by City

Source: (Astarina, 2020)

1.2 Problem Statement

The development of e-wallets in Indonesia in 2007 was not very successful; this can be seen from the number of e-wallet users in 2011, constituting 1.9 % of the adult population of Indonesia (Evans & Pirchio, 2015). The slow development of e-wallets was due to the small number of initial users and the low interest of merchants in Indonesia in accepting e-wallet payments. According to Widjaja and Tedjawidjaja, (2012), Indonesians preferred to pay in cash, rather than using e-wallets because the government at that time was not yet able to provide good telecommunications infrastructure and sufficient protection for e-wallet users. This deficiency made it increasingly difficult for Indonesians to make e-wallet payments as a new transaction habit.

Several years after the introduction of e-wallets to the public, the government, through BI, issued a policy to launch a cashless community movement in 2014. The intention of the cashless community policy was to increase public awareness of using non-cash

payments. This policy transformed the cash payment method to cashless, which is indicated by an increase in the number of people began adopting e-wallets. Of that number, there are e-wallet consumers who have used e-wallets since 2007 as early e-wallet consumers. Some of these earlier consumers stopped using e-wallets, but resumed its usage to participate in the cashless community movement. Nonetheless, this movement has not been able to replace cash payments (Abbas, 2017).

BI, which is responsible for strengthening the country's economy, has a vision to transform the country's economy into a digital economy. This responsibility was realised through the Indonesian Payment Blueprint Scheme (IPBS 2025). One vision of IPBS 2025 is to encourage digital innovation, such as via the launch of the Quick Response Indonesian Standard (QRIS), as one of the methods for digital payments. The weakness of QRIS is that this method requires using a bank account, while currently, not all residents are connected and have a bank account (Inggiharti, 2020). However, the potential of e-wallets to transform the country's economy is significant, and with the right strategies, digital transformation can be achieved. Regional economic activities can take place faster because e-wallet payments can be made from anywhere and at any time, as long as there is an internet connection. So far, the payment process has been through transactions at ATMs, while the distribution of ATMs in Indonesia is uneven (Bank Indonesia, 2019).

Knowing the characteristics of e-wallet consumers who have continued intention to use e-wallets is a crucial aspect that has not been explored in many e-wallet studies in Indonesia. This gap has led to a limited understanding of the obstacles related to the low continued intention to use the e-wallet. In contrast, research on accepting e-wallet

use in Indonesia is abundant, overshadowing the crucial aspect of continuing intention to use e-wallets. Given this, there is an urgent need for further research to comprehend the obstacles faced in continuing to use the e-wallet. Are the obstacles to the continued intention to use the e-wallet the same as those felt by the early e-wallet users? Or are there other obstacles faced by users who have the intention to continue using the e-wallet, considering they have felt the benefits of making e-transactions? This research, by filling the existing gaps, will not only provide valuable insights, but also shape the future of e-wallet in Indonesia, making it a topic of immediate relevance and urgency.

The security factor when transacting using e-wallet is one of the factors that makes consumers reluctant to use e-wallets. The security factor includes data leaks (Azizah et al., 2021; Susanto, et al., 2022), as when consumers want to transact using e-wallets, they must first provide sensitive personal information. They feel insecure if someone can hack into their data through phishing or pharming methods (Chang et al., 2022).

Another problem is transaction failure due to inadequate infrastructure (Ciptariantanto & Anggoro, 2022). Not all merchants can accept e-wallet payments because they are not tech-savvy and prefer cash (Singh & Sinha, 2020). This condition forces buyers who want to pay via e-wallet to switch to other payment methods, such as cash or smart cards. In addition, funds that have been stored in e-wallets and are not used to make transactions, are passive money, and this money cannot be increased nor be re-cashed (Azizah et al., 2021), and can only be transferred to other e-wallets within the same provider.

There are additional fees that merchants usually charge consumers to cover the initial cost of additional equipment that merchants must pay, and there are services, such as

electricity bills, that impose a transaction fee to consumers. Several companies provide incentives to cover costs to attract people to use e-wallets for their services, but only a few companies offer these incentives through e-wallets. Consumers will be reluctant to switch to e-wallets if they feel that using e-wallets is more costly than using cash. In addition, people who do not have a bank account state that topping-up e-wallet funds is not easy to do (Karniawati et al., 2021).

In Indonesia, e-wallets come in two types: card-based e-wallets and server-based e-wallets. The growth of card-based e-wallets in Indonesia is mainly driven by non-bank institutions, such as financial technology (fintech) companies and MNOs. These institutions manage almost 65% of card-based e-wallet accounts, while the rest are managed by banks (Suleiman, 2019). In addition, both institutions manage almost 100% of server-based e-wallets. Given this situation, banking institutions can expand their products by offering server-based e-wallet services. The involvement of banking institutions in providing server-based e-wallet services is expected to increase among the public. In addition, this step is expected to retain e-wallet users due to the increasing level of trust facilitated by government policies that ensure the safe handling of funds by banking entities.

Based on previous research, e-wallets have been accepted in Indonesia. However, the use of e-wallets among the public shows that the trend does not go beyond casual use. People should feel comfortable and continue to use e-wallets and develop the habit of using e-wallets as their primary payment method. Among the indicators that researchers have used to conclude the above statement are the readiness of the community to use e-wallets in daily transactions, such as the availability of funds in e-

wallets, convenience in using e-wallets, and the presence of merchants that provide e-wallet payment methods. This study is conducted to provide insights into a better understanding of the issue of continued intention to use e-wallets in Indonesia.

1.3 Research Questions

Based on the research background and problem statement discussed in the previous section, the main focus of this research is to determine the factors that influence the continued intention of consumers to use e-wallets. Therefore, the four main research questions that guide the research are as follows:

1. What are the factors that influence the continued intention of people to use an e-wallet for daily transactions?
2. What are the significant antecedents of trust for the continued intention of people to use an e-wallet?
3. Does consumer trust have any effect on strengthening the continued intention to use e-wallets for daily transactions?
4. Does the continued intention to use e-wallets affect a consumer's habit?

1.4 Research Objectives

This research developed a model on the factors that influence the continued intention to use e-wallets. To meet this aim, the sub-objectives are as follow:

1. To identify the factors influencing the intention to use an e-wallet for daily transactions.

2. To propose a consumer continued intention model towards e-wallet usage by addressing trust and habit.
3. To validate the e-wallet consumer continued intention model.

1.5 Scope of Study

This study focused on three types of e-wallets from fintech companies, two e-wallets from banks and one from a telecommunications company. The selection of these e-wallets is based on a BI Report that 65% of e-wallet providers come from fintech companies and MNOs, and the rest come from the banking industry. These e-wallets, which were among the top in terms of usage frequency in 2019 (Devita, n.d.) and 2020 (DSResearch, 2020), were chosen for their significant market share and influence on consumer behaviour.

This study particularly focused on consumers in the province's capital, such as Jakarta, Bandung, Semarang, Surabaya, and Yogyakarta, which are the key cities in Java Island. By concentrating on these cities, this study provides insights that are directly relevant to the majority of e-wallet users in Indonesia, thereby enhancing the applicability of the findings and keeping the people well-informed and engaged.

In this study, it is assumed that each respondent has experience in continuing to use e-wallets; therefore, this study used the Expectation-Confirmation Model (ECM) as the basic model for building a consumer continued intention model. The ECM is of paramount importance in this study, as it provides a solid foundation for the research. In this model, there is a confirmation construct. Confirmation is the answer to consumer expectations after using an e-wallet. In developing the questionnaire, criteria

questions were included that act as a filter so that the expected respondents have used e-wallets. In addition, this study emphasised on the influence of trust on continued intention to use the e-wallet, and identified variables that influence trust, namely perceived security, incentives, and wide acceptance.

1.6 Significance of Study

Understanding the issue of reusing a technological innovation, such as an e-wallet, is crucial for academics to understand the factors that cause e-wallets to be used repeatedly so that people are accustomed to using e-wallets as a payment method, it is also beneficial for practitioners and regulators. The current trend of e-wallet payments can significantly contribute to the government's goal of a cashless community. The advantages of e-wallet usage, such as reducing physical money and equalising economic activities, are promising. These advantages can be realised because e-wallet payments can be made from anywhere and at any time. BI's transformation towards a digital economy, marked by the issuance of the IPBS 2025, further underscores the potential benefits of e-wallet usage.

1.6.1 Significance of Theory

This study determined whether or not satisfaction, perceived usefulness, and trust, will make e-wallet consumers to have continued intention to use e-wallets. In addition, repeated use of e-wallets will form new user habits. Moreover, scholars, such as Azizah et al. (2021), Novika et al. (2021), Shao et al. (2018), and Susanto et al. (2016), have found that efforts to increase consumer satisfaction by providing a good experience after using an e-wallet will increase consumers' intention to continue using e-wallets. Several studies on trust, such as by Amoroso and Magnier-Watanabe (2012),

Kumar et al. (2018), and Undale et al. (2021), have revealed that trust is supported by providing security guarantees to consumers. Hence, this perceived security causes consumers to continue to use e-wallets. Trust is a cornerstone of e-wallet usage, and efforts to strengthen it will lead to increased user confidence in digital transactions. Several studies on e-wallets, such as by Bozic and Kuppelwieser (2019), Leong et al. (2020), and Santosa et al. (2021), have added incentives as a factor that causes users to continue to use e-wallets. Oh et al. (2006) stated that wide acceptance will increase the intention to continue to use e-wallets.

In the above-mentioned studies, no research has examined the factors that strengthen users' trust in continuing to use e-wallets. This study, in addition to identifying the factors that cause users to continue to use e-wallets, also examined whether or not perceived security, incentives, and wide acceptance, are the main factors that support strengthening trust of users to continue using e-wallets and creating new habits in transacting using e-wallets. This study recommends increasing consumer trust by providing better incentives, such as rewards and cash-back to enable the continued usage of e-wallets in the future. Strengthening trust can also be done by providing security guarantees during e-wallet transactions. This is an essential basis for the trust of e-wallet consumers because online financial transactions are always a sensitive issue for everyone. Trust can also be built among e-wallet consumers, which is the same as expanding the use of e-wallets. When e-wallet consumers find that many merchants have provided e-wallets as an alternative payment, they will also be moved to use e-wallets (Dahlberg et al., 2015; Migliore et al., 2022; Moghavvemi et al., 2021; Singh & Sinha, 2020). The choice of transacting using e-wallets will be felt when public acceptance of e-wallets is increasingly widespread, and this will encourage

merchants to increase their networks and the number of payment points when using e-wallets (Abbas, 2017). A more comprehensive range of e-wallet use will make consumers feel safe when making payments with e-wallets from anywhere.

Finally, e-wallets represent a significant step towards a cashless society, providing an opportunity for individuals without a bank relationship to engage in online transactions. This study demonstrates that continued intention will foster consumers' desire toward continued intention to use e-wallets, thereby cultivating a habit of using e-wallets for payment transactions. Ultimately, this study offers a model of continued intention to use e-wallets among consumers, emphasizing the factors influencing e-wallet usage and transforming it into a habit. This model identifies the factors that influence continued intention to use e-wallets and promotes e-wallet usage as a new consumer habit, aligning with government policy towards a cashless society and supporting the IPBS 2025.

1.6.2 Practical Significance

This study focused on e-wallet consumers and provides valuable insights into whether or not e-wallet usage will become a new consumer habit in payment transactions. Notably, the findings of this study have significant implications for e-wallet providers, equipping them with the knowledge of the factors that cause consumers to continue using e-wallets. This understanding is crucial for e-wallet providers to adapt and thrive in the evolving digital finance landscape, ensuring their services remain relevant and attractive to consumers.

This study is aligned with BI's policy to reduce cash circulation in Indonesia (Bank Indonesia, 2019). As part of this policy, BI launched a movement towards a cashless

society in 2014, aiming to change regulations regarding e-money, and announce a national payment gateway. These initiatives are part of BI's blueprint for the payment systems in the digital era. One of the key strategies is to strengthen digital finance by enhancing the relationship between the banking industry and fintech companies, and developing digital infrastructure to support the payment system (Bank Indonesia, 2019). Currently, e-wallets issued by fintech companies are more numerous than those issued by banks (DSResearch, 2020).

This study also suggests e-wallet providers must retain consumers who are using the e-wallet because retaining existing consumers is easier than finding new consumers (Bhattacharjee, 2001a). Providers must increase consumer satisfaction by providing a good experience after using the e-wallet. They must also increase consumer benefits during transactions and strengthen consumer trust to continue using e-wallets. The output of this study is important as it provides alternative recommendations, for example, e-wallet providers can propose better incentives, such as cash-back to increase the number of consumers continuing to use e-wallet in the future.

Financial transactions are always a sensitive issue for everyone. From the consumers' point of view, the output of the study shows that trust is significant in the continued usage of e-wallets, and making it a new habit of transacting using e-wallets. Therefore, trust is essential for consumers when using e-wallets. Trust can be increased through consumers' perceived security, i.e., they feel safe when making transactions, as well as through incentives and wide acceptance of e-wallets.

1.7 Operational Definitions of Variable

In this study, the term, 'e-wallet consumers' focuses on people who already have experience transacting with e-wallets. An e-wallet is used as payment media that uses software applications and portable devices – such as tablets and cell phones, by someone after transacting for goods and services, by reading the QR code or using the tapping method provided by the seller of services and goods.

Confirmation is the level of consumer understanding about e-wallets and their use and the level of consumer expectations regarding e-wallet performance, which can exceed or not meet consumer expectations.

Perceived usefulness is the benefit consumers feel when making transactions using e-wallets compared to the duration and transaction costs.

Satisfaction is the level of consumer acceptance and/or comfort after using an e-wallet.

Trust is the level of consumer confidence in switching their hard cash into digital form and using e-wallet services due to clear transaction procedures, provider reliability, and merchant reputation.

Perceived security is the consumer's perception that the e-wallet service mechanism is protected by information technology and legal capabilities.

Incentives are the level of trust a consumer has in the e-wallet provider's commitment to offering rewards, cash-back, and other incentives to reduce the costs of using an e-wallet.

Wide acceptance is the condition that e-wallets are already accepted and have mass consumers and merchants.

Habits are consumers' perceptions of always using e-wallets wherever and whenever and the availability of sufficient funds to be able to carry out transactions using e-wallets.

Continued intention is the willingness of consumers to reuse e-wallets and explore all e-wallet functions.

1.8 Structure of the Thesis

The thesis is organised into six chapters, and a summary of what each chapter entails is provided below:

Chapter One provides an overview of the thesis by providing the background on e-wallets. This chapter also mentions the motivation of the research, highlights the problem statement, and outlines the research questions and corresponding objectives, the scope and importance of the research, the operational definitions, and finally, the organisation of the thesis.

Chapter Two critically evaluates previous research and provides general insights into the theory and basic concepts considered in this thesis. This chapter also highlights the strengths and weaknesses of existing studies. Apart from that, this chapter explains the research's conceptual model and hypotheses developed.

Chapter Three explains the methodology used to achieve the objectives and the theoretical basis. This chapter details the research design, containing the research strategy, population sample, unit of analysis, and data collection.

Chapter Four presents the analysis' results in detail, namely a statistical description of the demographic profile of respondents and testing of the proposed model using measurement and structural models.

Chapter Five presents the results of research hypothesis testing based on statistical calculations in the previous chapter. This chapter discusses this study's contributions, limitations, and recommendations for future research, and ends with a conclusion.

1.9 Chapter Summary

This chapter provides an initial explanation and general overview of the entire thesis. It consists of the research background, problem formulation, research questions and objectives, scope of the study, and possible contributions of this research. Trust is the main driver behind this research, which has emerged in the existing literature on the continued use of e-wallets. This research intends to enrich the existing literature by studying initial beliefs when converting money into digital form, beliefs about continuing to use e-wallets, and several additional variables

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter thoroughly reviews the literature regarding the research domain to adapt previous models and theories to propose a suitable model for this research and its hypotheses. This chapter reviews the e-payment system, concepts and definitions, stages of accepting e-wallets, description of Indonesian e-wallets, advantages, problems, and challenges of e-wallet models, models and theories related to e-wallets, and critical success factors. Then, a description of the proposed model and consumers' continued intention is provided, followed by the hypotheses and theories. The chapter ends with a summary.

2.2 E-payment System

The development of online transactions gave rise to e-payment solutions. E-payment uses an online platform for goods/services. E-payment is a payment process without using paper instruments and uses a fund transfer scheme from one person or institution to another, who act as providers or consumers of the system (Dahlberg et al., 2015; Moghavvemi et al., 2021). For example, the banking industry provides payment systems for business institutions and individuals to complete transactions (Omotubora & Basu, 2018). This payment system prevents the theft of money because it does not involve cash (Aldaas, 2021; Angelina & Rahadi, 2020; Azizah et al., 2021). Besides having payment abilities, this system also performs clearing and remittances. Clearing is the process of reconciling the differences in the number of checks, drafts, or notes that each party owes the other, and remittance is a cross-border transfer of money in different currencies (Sreenu, 2020).

An example of an online payment mechanism is the smart card, a plastic card with a microchip inside that has a monetary value according to the consumer's top-up. The smart card can be used for various purposes, such as public transportation, and electronic cash. Every time a consumer uses the card, the system reduces the nominal value of the money stored in the chip. The usage of this card does not require card validation (Hove, 2004; Mombeuil, 2020).

Another example of an online payment mechanism is the use of a PC (Undale et al., 2021) that is connected to the internet or a wireless mobile device system (Dahlberg et al., 2008; Moghavvemi et al., 2021). This payment method is known as mobile payment (m-payment). M-payments are a convenient and a secure way to pay for everyday expenses as a substitute or alternative for cash, debit card, credit card, and other bill payments. Although m-payments look very promising, the use of these payments in Europe has not been successful, for example, in Denmark, France, and Germany (Hove, 2004). These countries have failed because of low consumer acceptance due to the imposition of costs on consumers, and the perceived usefulness by consumers is lower than the transaction costs (Sahut, 2008). Consumers also feel that m-payment transactions are less secure than debit or credit cards. This situation remained unchanged until 2019, but changed for the better after 2020. Aldaas et al. (2021) stated that card payments were still dominated by the most significant non-cash payments at that time. The situation began to change after the COVID-19 pandemic; there was a change in the attitude of the European Community towards payments using e-wallets (Astbury, 2021).

One type of m-payment is the e-wallet, a digital wallet that does not require participants to have a bank account number during registration (Sreenu, 2020). This feature makes e-wallets more flexible and user-friendly. Importantly, e-wallets are designed with robust security measures, providing a safe and convenient option for everyday expenses. The average daily consumer transaction amount for electronic payments is less than USD 10 (Apanasevic et al., 2016) or below £30 (Oney et al., 2017), making it a reassuring choice for managing daily expenses (Angelina & Rahadi, 2020; Apanasevic et al., 2016; Azizah et al., 2021; Mombeuil, 2020).

2.3 E-wallet

The principle of e-wallet is to digitise what is usually in a wallet, even though the main focus is money. Introducing e-wallets initially was to create a digital payment method that reduces the use of change. Some scholars have suggested limiting the payment of e-wallets to below USD 10, which is called micropayment (Apanasevic et al., 2016; Teng & Khong, 2021). Micropayments are used to purchase daily necessities, such as retail purchases and food or beverages. E-wallet payments are also categorised based on distance, namely remote and proximity payments, which use different supporting technologies (Teng & Khong, 2021). Remote payments provide e-commerce solutions (Aldaas, 2021; Slade et al., 2013), while proximity payments are used for vending machine payments and ticketing (Slade et al., 2013; Teng & Khong, 2021).

2.3.1 Definition and Concept of E-wallet

The definition of e-wallet evolves according to technological innovation (Teng & Khong, 2021). The term, 'e-money', is defined based on switching money to electronics by several researchers, including McAndrews (1997) and Hunafa et al.

(2017), who have used this term. Several others have mentioned the term, ‘e-cash’ (Okamoto, 1995; Szmigin & Bourne, 1999). In addition, some researchers have used the term, ‘digital money’ (Jones, 1999; Knorr, 1997). Other terms often used to describe e-cash are ‘e-purse’ and ‘e-wallet’ (Greenacre & Buckley, 2014).

As per the definitions in Table 2.1, e-wallets can take the form of different platforms, which can be cards or cell phones (Greenacre & Buckley, 2014). These payments use an open network (McAndrews, 1997), which can pose risks when carrying out e-wallet transactions. However, e-wallets offer a high degree of flexibility, as the data value information is stored electronically on chips in smart cards, servers, or cell phones (Baddeley, 2004; Greenacre & Buckley, 2014; Kim et al., 2013). This means that these payments can be made without the need for a bank account, making them a versatile and adaptable option (Baddeley, 2004).

Table 2.1
E-wallet Definition

Definition	Reference
“Systems that transmit payment or payment instructions over open networks”.	(McAndrews, 1997)
“An electronic store of monetary value on a technical device that may be widely used for making payments to undertakings other than the issuer without necessarily involving bank accounts in the transactions but acting as a prepaid bearer instrument”.	(Baddeley, 2004)
“Performing money functions with electronic equipment in various forms, that has a value information that is described with a digital signal that a bank sends to guarantee face value that saved in an IC chip, or a computer communication network built in a plastic card to be used in the information communication network”.	(Kim et al., 2013)
“A type of stored value instrument that (i) is issued on receipt of funds; (ii) consists of electronically recorded value stored on a device (such as a server, card, or mobile	(Greenacre & Buckley, 2014)

Table 2.1 continued

Definition	Reference
phone); (iii) may be accepted as a means of payment by parties other than the issuer; and (iv) is convertible back into cash”.	
“A type of electronic card which is used for transactions made online through a computer or a smartphone, its utility is the same as a credit or debit card, and needs to be linked with the individual’s bank account to make payments”.	(Undale et al., 2021)
“An electronic card or an app that consumers use when conducting online transactions via mobile devices such as tablet, laptop, or smartphone”.	(Hamzah et al., 2023)

The understanding in Table 2.1 is still relevant to the current state of e-wallets. First, e-wallet is one of the most widely used e-payment methods for cash replacement with certain payment limits (Alriani et al., 2017; Teng & Khong, 2021), with the payment range being micropayments (Isrososiawan et al., 2019; Mulyani & Davronov, 2023). Second, e-wallets can store a certain amount of money and carry out payment functions, such as toll payments and parking tickets (Hove, 2004; Teng & Khong, 2021), vending machines (Teng & Khong, 2021), shopping (Angelina & Rahadi, 2020; Chang et al., 2022; Sharma et al., 2019; Sikri et al., 2019; Teng & Khong, 2021), e-hailing (Ciptariantanto & Anggoro, 2022), and food purchases (Angelina & Rahadi, 2020; Teng & Khong, 2021). E-wallets can also make telecommunication bill payments (Angelina & Rahadi, 2020; Teng & Khong, 2021) and water bills (Sharma et al., 2019), and transfer funds to the same provider (Angelina & Rahadi, 2020; Chandran & Pitchandi, 2020; Teng & Khong, 2021). This function has gone beyond the initial function of e-wallets, namely reducing the use of coins when using cash payments (Mombeuil, 2020; Teng & Khong, 2021). Third, e-wallets have changed in terms of form. Initially, e-wallets were in the form of smart cards or based on refill cards (Clark, 2005; Gunawan & Aprianingsih, 2017; Hove, 2004). E-wallets are categorised as

prepaid cards (Hove, 2004; Lai, 2012), The card has an embedded microchip that sends signals to a signal reader (Amoroso & Magnier-Watanabe, 2012; Lai, 2012; Oney et al., 2017). This card is used for transactions if the merchant has additional devices to read the signals sent from the prepaid card (Lai, 2012). E-wallets are developed on cell phones and are reliable on wireless networks (Mombeuil, 2020). In addition, e-wallets can function if consumers deposit money into an e-wallet account or if the money is available according to its intended purpose (Azizah et al., 2021; Sahut, 2008; Sfenrianto et al., 2017). The prepaid card has various purposes, such as for public transportation (Septiani et al., 2018), toll payments (Gunawan & Aprianingsih, 2017), parking, and payment for online purchases (Dahlberg et al., 2008).

In this study, the term, 'e-wallet', is used for payment media that uses software applications and portable devices – such as tablets and cell phones, by someone after transacting for goods and services, by reading the QR code or using the tapping method provided by the seller of services and goods.

2.4 Acceptance of E-wallet

E-wallets are divided into card-based and server-based e-wallets (Hamzah et al., 2023). Card-based e-wallets use smart cards, such as Flazz in Indonesia and Bigpay in Malaysia. Meanwhile, server-based e-wallets are connected to an application on a cell phone, such as Gopay in Indonesia and Touch 'n Go in Malaysia.

The e-wallet acceptance differs in each country; countries that have adopted e-wallets have varying acceptance rates. Countries with the same acceptance level do not necessarily implement e-wallets similarly (Snellman & Vessala, 2001). For example, in developed countries, e-wallet focuses on Near-Field Communication (NFC) and

card-based e-wallet; in less developed countries, the focus is on server-based e-wallet, such as M-PESA in Kenya (Oliveira et al., 2016). In developed countries, people are accustomed to using cards with signatures because they assume this provides a sense of security and trustworthiness (Krol et al., 2017). On the other hand, in developing countries, financial services are not distributed well to communities; so, when there are accessible financial services, many people try to use them (Ahmad et al., 2021).

The literature reviews show (Table 2.2) that there are studies about e-wallet acceptance in the world, such as in Malaysia, Indonesia, Thailand, China, India, France, and the US. The research in these countries has often used these constructs: perceived usefulness (Chawla & Joshi, 2019; Swilley, 2010); perceived ease of use (Chawla & Joshi, 2019; Swilley, 2010); behavioural intention (Polasik et al., 2012); social influence (Mugambe, 2017; Shin, 2009); risk (Swilley, 2010); perceived risk (Nguyen & Huynh, 2018); intention to use (Islam et al., 2020); performance expectancy (Mugambe, 2017); effort expectancy (Mugambe, 2017); and facilitating conditions (Mugambe, 2017). Eight of the 10 constructs have its origins in the Technology Acceptance Model (TAM) and the unified theory of acceptance and use of technology (UTAUT) model. Risk and perceived risk arise because users are concerned with risks when carrying out e-wallet transactions (Swilley, 2010). Constructs that can neutralise risk when using e-wallets are security, perceived security, trust, and perceived trust. These four constructs have also been used in studies on e-wallet acceptance.

Table 2.2
Constructs in the E-wallet Acceptance Model

No.	Construct	References																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	Perceived Usefulness	x		x	x	x	x		x	x		X		x			x		x	x			x			x	x	x		x
2	Perceived Ease of Use	x		x		x	x		x	x		X					x	x	x				x			x	x	x		x
3	Cost	x																	x											
4	Perceived Cost											X		x																
5	Technology Acceptance	x																												
6	Security		x													x							x	x						
7	Perceived Security											X					x													x
8	Trust		x																				x							x
9	Perceived Trust													x				x	x						x					
10	Social Influence		x					x			x	X	x						x		x	x		x	x					
11	Self-efficacy		x				x								x												x	x		
12	Gender		x																											
13	Age		x													x														
14	Experience		x																											
15	Voluntaries		x																											
16	Risk			x																										
17	Perceived Risk								x				x		x		x	x		x		x			x					x
18	Behavioural Intention to use			x																							x			
19	Attitude			x	x		x										x						x				x			
20	Social Norm			x								X																		x
21	Security and Privacy			x																								x		
22	Intention to use					x	x					X		x	x			x	x	x										x
23	Performance Expectancy				x			x			x		x								x			x	x					x

Table 2.2 continued

No.	Construct	References																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
24	Effort Expectancy							x			x		x		x						x			x	x					x
25	Facilitating Condition							x			x		x								x		x	x	x					x
26	Behavioural Intention					x		x			x		x								x			x	x	x			x	x
27	Promotional Activities												x													x				
28	Actual Use												x			x														
29	Perceived Compatibility													x																
30	Perceived Customer Value Added													x																
31	Awareness													x																
32	Perceived Convenience														x				x											
33	Usage Barrier										x						x													
34	Value Barrier										x						x													
35	Risk Barrier										x						x													
36	Tradition Barrier										x						x													
37	Image Barrier										x						x													
38	Visibility																x													
39	Habit							x							x		x													
40	Adoption																x													
41	Government support																			x		x								
42	Hedonic Motivation							x			x														x					
43	Compatibility																					x		x						
44	Perceived Transaction Convenience																					x								
45	Relative Advantage																					x								
46	Adoption Intention								x													x								
47	Additional Value																					x								

Table 2.2 continued

No.	Construct	References																												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
48	Absorptive capacitive																					x								
49	Affinity																					x								
50	Personal Innovation for IT																					x								x
51	Intention				x																		x							
52	Lifestyle compatibility																						x							
53	Innovation																								x					
54	Behavioural Intention Recommendation																								x					
55	Price Value							x			x													x		x				
56	Intrinsic Motivation		x																											
57	Extrinsic Motivation		x																											
58	Privacy															x											x			
59	Anxiety																										x			
60	Area					x																								
61	Technology Experience				x																									

Note:

1 = (Sahut, 2008); 2 = (Shin, 2009); 3 = (Swilley, 2010); 4 = (Lai, 2012); 5 = (Polasik et al., 2012); 6 = (Gunawan & Aprianingsih, 2017); 7 = (Mugambe, 2017); 8 = (Nguyen & Huynh, 2018); 9 = (Purwanto et al., 2019); 10 = (Migliore et al., 2022); 11 = (Lan et al., 2020); 12 = (Wei et al., 2021); 13 = (Singh & Sinha, 2020); 14 = (Pal et al., 2021); 15 = (Khanra et al., 2021); 16 = (Kavitha & Kannan, 2020); 17 = (Islam et al., 2020); 18 = (Do & Do, 2020); 19 = (Aji et al., 2020); 20 = (Gupta et al., 2021); 21 = (Chen et al., 2019); 22 = (Chawla & Joshi, 2019); 23 = (Oliveira et al., 2016); 24 = (Madan & Yadav, 2016); 25 = (Molina-Castillo et al., 2016); 26 = (Bailey et al., 2017); 27 = (Karim et al., 2020); 28 = (Jin & Pratama, 2019); 29 = (Ibrahim et al., 2019).

E-wallet research in Indonesia has been conducted in diverse fields, utilising various models and approaches. The UTAUT2 model, for instance, has been used to describe the e-wallet acceptance phase in research conducted by Megadewandanu et al. (2017) and Limantara et al. (2018). On the other hand, research on e-wallet acceptance using the TAM has been conducted by Suhud et al. (2020). In the e-wallet continued intention phase research, the UTAUT2 model remains the most widely used model, as demonstrated by Santosa et al. (2021) and Indrawati and Putri (2018). Other studies, such as that by Nelloh et al. (2019), have used a model that includes trust.

2.5 E-wallet Usage in Indonesia

In Indonesia, e-wallet comes in two forms: card-based and server-based. A card-based e-wallet was initiated by the banking industry, namely the Flazz card from Bank Central Asia (BCA) in 2009, followed by Sakuku in 2015, which operates the server-based card. In 2012, the banking sector in Indonesia launched an e-wallet known as Rekening-Ponsel from CIMB Niaga that used the cell phone as a transaction medium, including for making transfers, purchasing prepaid credit, paying bills and even cash withdrawals without using an ATM card. In 2018, Bank Mandiri launched an e-cash and server-based e-wallet.

The server-based e-wallet started with cellular network operators, with Telkomsel with T-cash in 2007, Indosat with Dompotku in 2008, XL cash with Excelcomindo Pratama in 2012, and Uangku with Smartfren Telecom in 2014. Initially, T-cash was an internet server-based e-wallet issued by Telkomsel, which had limited functions, including reloading tickets and paying telecommunication service bills. In 2012, BlackBerry Messenger (BBM) introduced the e-wallet BBM Money, which could be utilised for

money transfers among BBM users. In 2018, BBM Money underwent a name change to DANA. In 2016, the e-wallet market saw a significant shift with the entry of fintech companies. These companies, such as Gopay by Gojek, introduced e-wallets for ride-hailing (for example, Grab) payments. A year later, Grab collaborated with Lippogroup and introduced OVO (Figure 2.1).

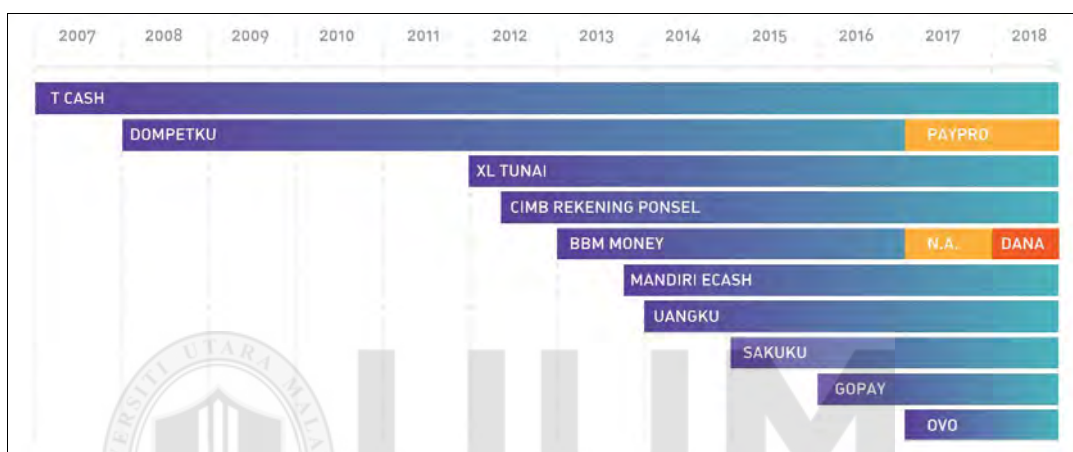


Figure 2.1 Mobile Payment Launch Timeline in Indonesia

Source: (Agusta, 2018)

On August 14, 2014, BI launched a cashless community movement to minimise cash payments. However, e-wallet use did not significantly increase (Figure 2.2). Then, in 2017, BI, which regulates payment schemes, including e-wallets used in Indonesia, issued payment scheme regulations through PBI regulation No.19/12/PBI/2017, specifically for e-money through BI regulation No. PBI No.20/6/PBI/2018 (Aji & Adawiyah, 2021). Apart from that, BI launched the IPS, whose vision is to support integrating the digital financial economy with banking digitisation, to ensure connectivity between fintech companies and banks.

Based on e-wallet transaction data from BI, Figure 2.2 shows an increase in e-wallet use, with most users using server-based e-wallets. This was triggered by technological developments and the ease with which people can obtain devices for cashless payment transactions.



Figure 2.2 E-wallet in Indonesia

Source: Bank Indonesia

To make payment activities more accessible for the Indonesian people, BI introduced a payment Blueprint 2019 containing five valid payment initiatives from 2019 to 2025. The first initiative, developing open banking, includes determining the National Payment Gateway (cashless society movement). This standardization includes standardizing data, Application Programming Interface (API) management techniques, and transaction security. This national payment movement aims to bridge the banking and non-bank industries. About 51% of the Indonesian population have not been served by banks, and so, it is hoped that even though they do not have the opportunity to interact with banks, these people will still receive financial services

from non-bank parties (Bank Indonesia, 2019). One of these initiatives is to strengthen e-wallet payments. In the second initiative, the government strengthen cooperation between banks and non-banks in providing financial services to the community. The third initiative strengthen financial market infrastructure regulations; the fourth initiative develop data infrastructure for the public; and finally, it strengthen regulations and encourage supervision of the implementation of the digital economy (Bank Indonesia, 2019).

E-wallet research in Indonesia is in two stages simultaneously: at the acceptance stage and the continuing to use e-wallets stage. E-wallets are not only limited to e-wallets managed by banks, but are also issued by non-bank parties, such as MNOs and fintech companies. These two types of e-wallets must be registered with BI because BI regulates the circulation of money in Indonesia.

The fundamental difference between banks and non-bank parties is that the government automatically protects every financial transaction carried out by a bank to a certain extent. In contrast, the government does not have a policy to protect financial transactions carried out by non-bank parties. This condition causes non-bank providers to face challenges related to consumer trust in using their e-wallets.

In the acceptance phase, the relatively new e-payment method may mean that consumers are unfamiliar with e-wallet payment procedures and the environment. In other words, they may have inadequate knowledge of the e-wallet. The low level of trust has been an obstacle to consumers' technology acceptance, and there will be no post-experiences if there is no acceptance. Consumers hope that e-wallets can meet

their expectations and they will not be taken advantage of their lack of knowledge about e-wallets (Chandra et al., 2010). In the next phase, the consumer begins to accept and tries using an e-wallet, and after having experienced it, the consumer may continue to transact with the e-wallet.

Based on Table 2.3, the previous research on e-wallets in Indonesia can be categorised into the acceptance stage and the continuance stage of using e-wallets; in other words, it refers to the intention to continue and the intention to use. Studies conducted at the acceptance stage include those by Widjaja & Tedjawidjaja (2012), Hidayanto et al. (2015), Khatimah & Halim (2016), Hunafa et al. (2017), Megadewandanu et al. (2017), Riskinanto et al. (2017), Sfenrianto et al. (2017), Chandra et al. (2018), Limantara et al. (2018), Septiani et al. (2018), Isrososiawan et al. (2019), Mahwadha (2019), Rosnidah et al. (2019), Purwanto et al. (2019), Widodo et al. (2019), Suhud et al. (2020), Widyanto et al. (2020), Lonardi & Legowo (2021), and Novika et al. (2021); while, studies on the continued intention of using e-wallets are by Azizah et al. (2018, 2021), Istiyana and Triana (2019), Nelloh et al. (2019), and Santosa et al. (2021).

From those studies, there nine main constructs studied are Social Influence (Widjaja & Tedjawidjaja, 2012), Facilitating Conditions (Hunafa et al., 2017). Performance Expectations (Santosa et al., 2021), Effort Expectations (Santosa et al., 2021), Behavioural Intentions (Hidayanto et al., 2015; Widjaja & Tedjawidjaja, 2012), Perceived Ease of Use (Riskinanto et al., 2017; Septiani et al., 2018), Perceived Usefulness (Riskinanto et al., 2017; Septiani et al., 2018), and Trust/Perceived Trust, and Security/Perceived Security (Mahwadha, 2019; Widyanto et al., 2020). Of those nine variables, it can be evidenced that five variables come from UTAUT2 and 4

variables from TAM. The last two constructs, perceived trust and security, are examined in this study. Trust is an important reason consumers use technology (Susanto et al., 2016; Shaw, 2014). Trust in perceived security can be increased to ensure consumers use e-wallets (Moghavvemi et al., 2021).



Table 2.3

Constructs in the E-wallet Acceptance and Continued Intention Model in Indonesia

No.	Constructs	References																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	Perceived Usefulness			x			x	x			x					x		x		x	x		x		
2	Satisfaction									x															x
3	Trust		x					x		x		x		x	x		X		x						x
4	Perceived Trust										x											x	x		
5	Flow									x															x
6	System quality									x															x
7	Information quality									x					x										x
8	Services quality									x															x
9	Performance Expectancy	x				x			x			x	x				X		x			x		x	
10	Effort Expectancy	x				x			x			x	x				X		x			x		x	
11	Social Influence	x		x		x			x			x	x	x			X	x	x	x		x		x	
12	Facilitating Condition	x		x	x	x						x	x				X		x			x		x	
13	Price Value					x						x		x			X							x	
14	Habit			x		x						x					X							x	
15	Inertia																								x
16	Security	x	x												x					x					x
17	Perceived Security								x																
18	Hedonic Motivation					x						x					X		x						
19	Relative Advantage		x																						
20	Privacy		x												x										
21	Self-efficacy				x									x											
22	Perceived Risk		x								x			x			X					x			
23	Prior Experience															x									
24	Attitude				x		x				x					x		x					x		
25	Perceived Ease of Use		x	x			x	x			x					x				x	x				

Table 2.3 continued

No.	Constructs	References																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
26	Social Risk											x													
27	Responsiveness																			x					
28	Actual Use						x													x					
29	Adoption										x							x							
30	Perceived reputation										x														
31	Environment Risk										x														
32	Perceived mobility										x														
33	Social Norm		x					x																	
34	Innovation		x	x				x																	
35	Compatibility							x																	
36	Perceived enjoyment							x																	
37	Variety of Services							x																	
38	Culture								x																
39	Convenience			x																					
40	Convertibility			x																					
41	Cost	x																							
42	Intrinsic Motivation			x																					
43	Income			x																					
44	Gender			x																					
45	Age			x			x																		
46	Complexity				x																				
47	Awareness				x																				
48	PBC (perceived behaviour control				x																				
49	Perceived Regulatory Support																					x			
50	Promotional Benefit																					x			
51	Intention to use			x	x				x		x			x				x							

Table 2.3 continued

No.	Constructs	References																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
52	Usage Behaviour												x												
53	Behavioural Intention	x	x			x		x			x	x					X		x	x		x	x		
54	Usage Intention															x									
55	Continuance Usage									x															
56	Continuance Intention														x									x	x

Note:

1 = (Widjaja & Tedjawidjaja, 2012); 2 = (Hidayanto et al., 2015); 3 = (Hunafa et al., 2017) ; 4 = (Khatimah & Halim, 2016); 5 = (Megadewandanu et al., 2017); 6 = (Riskinanto et al., 2017); 7 = (Septiani et al., 2018); 8 = (Sfenrianto et al., 2017); 9 = (Azizah et al., 2018); 10 = (Chandra et al., 2018); 11 = (Limantara et al., 2018); 12 = (Rosnidah et al., 2019); 13 = (Istiyana & Triana, 2019); 14 = (Nelloh et al., 2019); 15 = (Purwanto et al., 2019); 16 = (Widodo et al., 2019); 17 = (Suhud et al., 2020); 18 = (Widyanto et al., 2020); 19 = (Novika et al., 2021); 20 = (Isrososiawan et al., 2019); 21 = (Lonardi & Legowo, 2021); 22 = (Mahwadha, 2019); 23 = (Santosa et al., 2021); 24 = (Azizah et al., 2021).



At the acceptance stage, the widely used constructs are Social Influence, Performance Expectancy, Effort Expectancy, Facilitating Conditions, Perceived Usefulness, Perceived Ease of Use, Price Value, Trust, and Hedonic Motivation (Table 2.3). Of the nine constructs, six are part of the constructs contained in the UTAUT/UTAUT2 model; and the other 3 are constructs in TAM. Both of these models have been commonly used to study e-wallet acceptance in Indonesia.

Trust, which is a key factor in e-wallet acceptance, plays an important role in the decision-making process. Trust is the consumers' belief that the e-wallet will function as expected, and that their personal information will be secure. Social influence, performance expectations, and price value influence trust. Users must first use the technology before achieving the desired outcomes, such as increased work productivity and improved work performance (Venkatesh et al., 2016).

Based on the constructs depicted in Table 2.3, it can be seen that in describing the acceptance and continuance stages, those researchers have used the UTAUT model. This UTAUT model, during the acceptance stage, uses four main variables: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions, related to efforts to predict user intention to use the technology. The UTAUT model is an acceptance model that has the same characteristics as the TAM. The UTAUT model construct, namely Effort Expectancy, has a similar function to the Perceived Ease of Use variable in the TAM (Tam et al., 2018). The same idea applies to performance expectations, which describe users' performance expectations, similar to the perceived usefulness variable, which describes acceptance in the TAM (Tam et al., 2018). In the continuance stage, there are additional constructs, namely Hedonic Motivation, Price Value, and Habit. This

model or the UTAUT2 model, is a more comprehensive model, playing an important role in predicting the continued usage of e-wallets. Hedonic Motivation and Price Value are new predictors of Behavioural Intention, and Habit is a new predictor of Intention to Use Technology and Behavioural Intention (Venkatesh et al., 2016). Hedonic Motivation is used to describe the pleasure obtained from using technology (Chang & Zhu, 2012); in this case, the motivation to use e-wallets is influenced by the user's pleasure when using e-wallets.

Habit is the experience obtained when consumers first use an e-wallet, and plays a significant role in e-wallet usage. Research has shown that habit is a behaviour that automatically exists because of learning; in other words, the habit of using an e-wallet occurs because of experience in using an e-wallet. The first time a user uses an e-wallet is a learning experience that leads to automatic use in the future. This underlines the importance of user experience in shaping e-wallet usage patterns.

Several studies on e-wallets in Indonesia have stated that one of the inhibiting factors for e-wallet acceptance is low public trust. For example, Indrawati and Putri (2018) found that one of the factors for the rapid increase in e-wallet usage is public trust in using it. These findings are aligned with Widodo et al.'s (2019) research that trust increases the predictive value of continued intention, meaning that trust affects the consumers' intention to use the e-wallet. One way to overcome this trust problem with fintech companies is to improve financial services; this can be done by improving the security system and providing better consumer services to overcome consumer problems (Indrawati & Putri, 2018). Megadewandanu et al. (2017) found that the factors most influencing behavioural intention are habits, social influences

business expectations, and business motivation. This can happen because the researchers have considered Indonesia's e-wallet in the acceptance stage. E-wallet development is immature, as can be seen through its high costs, limited support, and inconsistent performance. The maturity of e-wallet development can significantly impact user acceptance at the continuance stage, as mature e-wallets are more likely to have lower costs, better support, and consistent performance, which can attract more users and encourage them to continue using the e-wallet.

2.5.1 Benefits

The maturity of e-wallet development can significantly impact user acceptance at the continuance stage, as mature e-wallets are more likely to have lower costs, better support, and consistent performance, which can attract more users and encourage them to continue using the e-wallet.

The use of e-wallets can provide more benefits than cash. During the use of an e-wallet, people do not need to carry the exact change or a wallet full of heavy coins (Azizah et al., 2018; Hove, 2004; Mombeuil, 2020). Another benefit of using e-wallets is that it makes life easier for people to pay automatically for vending machine, parking areas and toll (Hove, 2004; Lan et al., 2020). People only need one card and can swipe it on the device without a Personal Identification Number (PIN) for transactions (Mombeuil, 2020; Rovita et al., 2018; Shaw, 2014).

There are several benefits for traders as well. It provides an economical solution when handling cash (Rovita et al., 2018), such as calculating cash receipts at the end of the day or transactions with vending machines (Hove, 2004). Merchants can combine the e-wallet with logistics applications that automatically calculate

company profits. E-wallets can attract more consumers because of the ease of payment offered by e-wallet providers. According to Boden et al. (2020), buyers seek payment convenience.

Moreover, e-wallet usage benefits business organizations because the provider has consumers' data and shopping habits. Because of the nominal micropayments, consumers can use e-wallets to purchase at kiosks or vending machines. Apanasevic et al. (2016) said that micropayments are less than USD 10, and Oney et al. (2017) found it is under £30. Kim et al. (2010) stated that a small payment will increase transaction speed and efficiency. The small payment range has led to the use of e-wallets becoming universal. It does not require a bank account to increase the security value and limits the risk of loss and theft. Moreover, the e-wallet reduces money circulation (Ahmad et al., 2021; Amoroso & Magnier-Watanabe, 2012; Nguyen & Huynh, 2018), and counterfeit (Moghavvemi et al., 2021; Nguyen & Huynh, 2018).

2.5.2 Issues and Challenges

The benefits of an e-wallet can also create some issues or challenges. The potential to simplify transactions for consumers, initially a cause for optimism, has also raised concerns due to unfamiliarity with the technology at the time of its introduction. The aim to streamline cash handling for merchants has led to additional costs. In essence, the issues that arose with the use of plastic money are now being mirrored in e-wallet usage.

These factors have contributed to the slow acceptance of e-wallets, despite their long introduction to the public. Guo et al. (2015) discovered that merchant and consumer acceptance are interdependent, with the acceptance of one party influencing the other.

When numerous merchants offer e-wallet payment options, consumers perceive it as an alternative. They are more likely to choose e-wallets as a payment option. Conversely, when a consumer is ready to use an e-wallet, but struggles to find a merchant that accepts e-wallet payments, he or she may resort to another payment method.

2.5.2.1 High Cost

According to Nguyen et al. (2020), there are costs that consumers must incur for the use of technology services, namely transaction fees, maintenance costs, communication costs, and cell phone costs. The cost of cell phones, which is the cost of procuring a cell phone by the consumer, can be considered small based on the assumption that consumers buy a cell phone to support their communication activities, and not solely to use the e-wallet. Consumer inconvenience can be caused by hidden costs imposed by merchants (Aldaas, 2021; Susanto, et al., 2022), such as investment costs incurred but charged to the consumer. Boden et al. (2020) showed that mobile technology acceptance requires an initial investment, including purchasing hardware to read the signal sent from the consumer's cell phone and software to encode the signal.

The high cost of procuring additional equipment has led to merchants' low acceptance of e-wallets. Merchants wishing to choose an e-wallet as a payment method must prepare additional devices to read and validate e-wallet functions. Only some merchants can prepare these devices for e-wallet services (Loke et al., 2013). In addition, there are additional costs for processing transactions that the merchant must

bear; if the merchant does not have a contract with the consumer, any consumer negligence cannot be claimed as a consumer's mistake (Krol et al., 2017).

The unpreparedness of the initial investment has resulted in low e-wallet acceptance among merchants (Singh & Sinha, 2020), leading to the acceptance rate of e-wallet consumers being less than encouraging because consumers need help finding merchants that provide e-wallet services (Moghavvemi et al., 2021).

2.5.2.2 Low Compatibility

Dahlberg et al. (2008) studied elements of technology and standards because this payment method uses many technologies whose development is different; standardization of equipment and protocols for utilisation are needed. Devices may not be compatible or standardised to enable provider interoperability (Hamzah et al., 2023; Loke et al., 2013). Every merchant must prepare this device, which is a high investment. On the other hand, if the merchant's device cannot read the consumer's e-wallet, the transaction could be cancelled, which will be a lost opportunity for the merchant.

For most merchants, device incompatibility is a significant barrier to acceptance, leading to numerous limitations in implementing e-wallets (Moghavvemi et al., 2021). This incompatibility issue not only hinders the offering of e-wallet payment options, but also poses a substantial financial burden. To accommodate all providers, a merchant would need to provide a device for each, which is often not feasible due to the high costs involved. Merchants are therefore faced with the challenge of ensuring that the costs are justified by the benefits they will receive.

From the consumers' point of view, the condition may seem limiting, as they cannot always use their e-wallets due to merchants' device availability (Hove, 2004; Moghavvemi et al., 2021). However, the potential solution of integrating all e-wallet forms into one device (Teo et al., 2015) offers a promising future. This integration could significantly enhance compatibility among e-wallet providers (Al Khasawneh & Irshaidat, 2017), providing consumers with more opportunities to use their e-wallets.

2.5.2.3 Technology-Savvy

Not all people are technology-savvy; so certain groups might need a traditional payment method, for example, cash, especially the elderly and those who live in rural areas. Nielsen (2016) found that millennials are the highest consumers of mobile payments in restaurants and retail stores compared to other generations, especially the silent generation and baby boomers. Baby boomers are born between 1946 and 1965, while the silent generation is before the baby boomers. Gen Z is the most technologically literate generation, and uses technology in their lifestyle (Santosa et al., 2021). In addition, the limitations of mobile equipment reduce mobile technology's usability and consumer friendliness (Leong et al., 2020).

Currently, e-wallets are an application-based device used in cell phones. According to Liébana-Cabanillas et al. (2019), although cell phone penetration is high (66% of the world's population owns one cell phone), not everyone has a cell phone that can use the e-wallet application. An e-wallet requires a device capable of reading NFC signals and barcodes (Azizah et al., 2021).

Another challenge related to e-wallet application, for example, the obstacle to using the e-wallet, is the processing time of transactions and the capability to use it. First, the processing time of a transaction is perceived to be longer than traditional transactions (Moghavvemi et al., 2021; Polasik et al., 2012). This assumption is because everyone willing to use the e-wallet must learn the procedure. Initially, consumers must download the application and register with the provider to use the e-wallet, which takes time (Hayashi, 2012; Sujith et al., 2019). In sum, a debit card's validation takes longer than usual, meaning the e-wallet needs more time for one transaction (Polasik et al., 2012; Syadzwan & Abdul, 2021).

2.5.2.4 Lack of Trust

Another significant constraint is the trust in e-wallet usage. Trust has become a support factor in information technology that influences individuals to use it (McKnight et al., 2011). Trust includes security issues; some consumers are skeptical about security because there is a procedure for entering personal information (Moghavvemi et al., 2021) and the possibility of transaction failure due to application downtime as a result of server problems during transactions (Nilashi et al., 2015). Financial transactions, both online and offline, still have security loopholes. Nowadays, security and convenience are important factors. However, there is often a trade-off between the two, as enhancing security measures can sometimes lead to inconvenience for consumers. Striking the right balance is crucial in e-wallet development (Kaur et al., 2020; Mombeuil, 2020).

2.5.3 Models and Theories Applied in E-wallet

The dissemination of innovation begins with the acceptance of technology, which is then disseminated according to the method of communication, the time of its introduction, and the existence of a social system (Sahin & Rogers, 2006). The same applies to e-wallet acceptance.

From observation, few studies have been done on the continued intention of e-wallet usage, especially in Indonesia. Prior studies have focused on the acceptance model of e-wallets; some studies on the continued intention of e-wallet usage in general, applying models, like the UTAUT model (Nakwari et al., 2018), Health Belief Model (HBM) (Daragmeh et al., 2021); Technology Continuance Theory (TCT) (Novika et al., 2021); technology readiness index (TRI); and extended expectation-confirmation model (E-ECM) (Humbani & Wiese, 2019). The constructs studied in these studies include Confirmation, Perceived Usefulness, and Satisfaction.

Table 2.4
Research about Continued Intention E-wallet.

No.	Constructs	References												
		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Confirmation	x		x		x							x	
2	Perceived usefulness	x	x	x	x	x		x					x	x
3	Satisfaction	x		x	x	x		x	x	x	x	x	x	
4	Continuance Intention	x		x	x	x	x	x	x	x	x	x	x	x
5	Perceived ease of use	x		x	x	x		x				x	x	x
6	Attitude	x		x					x				x	
7	Social Distancing	x												
8	Usage Intention		x											
9	Risk					x								
10	Perceived Risk		x				x		x			x		
11	Trust		x		x		x	x			x	x	x	
12	Perceived Severity				x									
13	Perceived Susceptibility				x									
14	Self-Efficacy				x									

Table 2.4 continued

No.	Constructs	References												
		1	2	3	4	5	6	7	8	9	10	11	12	13
15	Quality				x									
16	Familiarity				x									
17	Situational Normality				x				x			x		
18	Security				x		x							
19	Perceived Security							x						
20	Feedback Mechanism				x									
21	Optimism					x								
22	Innovativeness					x								
23	Convenience					x						x		
24	Compatibility					x								
25	Discomfort					x								
26	Insecurity					x								
27	Cost					x								
28	Perceived Cost								x					
29	Reputation						x					x		
30	Mobility						x							
31	Customization						x							
32	Gender						x							
33	Perceived Behavioural Control								x					
34	Actual Continuance Behaviour								x					
35	Perceived Control									x				
36	Postadoption PU									x				
37	Disconfirmation PU									x				
38	Institution-based trust									x				
39	Trusting belief									x				
40	Postadoption perceived risk									x				
41	Disconfirmation PR									x				
42	Perceived Similarity										x			
43	Perceived entitativity										x			
44	Service assurance											x		
45	Service quality											x		
46	System quality											x		
47	Task technology fit											x		
48	Habit												x	
49	Operational Constrain												x	
50	Privacy and Security													x
51	Perceived Enjoyment													x

Note:

1 = (Nakwari et al., 2018); 2 = (Nuryasman & Warningsih, 2021); 3 = (Daragmeh et al., 2021); 4 = (Phuong et al., 2020); 5 = (Humbani & Wiese, 2019); 6 = (Shao et al., 2018); 7 = (Kumar et al., 2018); 8 = (Koloseni & Mandari, 2017); 9 = (Chen & Li, 2017); 10 = (Cao et al., 2018); 11 = (Novika et al., 2021); 12 = (Ying & Mohamed, 2021).

Discussions regarding continued intention to use are always related to the acceptance stage because someone who wants to continue using a technology must go through an acceptance process first. The spread of innovation begins with accepting technology, which is then disseminated according to communication methods, time of initiation, and social systems (Sahin & Rogers, 2006). The same applies to e-wallet acceptance. Some researchers have described the acceptance of e-wallet technology using the TAM, and others have used the UTAUT model. Both TAM and the UTAUT model have several similarities because the UTAUT model is an adaptation of the TAM (Venkatesh et al., 2016).

Table 2.4 illustrates several e-wallet research studies in different countries with various foci. Based on Table 2.4, the most frequently used variables are Perceived Usefulness, Perceived Ease of Use, Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence, and Risk. The first two variables are based on the TAM and adopted into the UTAUT model to become Performance Expectancy and Effort Expectancy. Perceived usefulness and performance expectancy describe the benefits and performance felt and expected by users, while perceived ease of use and effort expectancy indicate the level of convenience that users expect when using e-wallets. Facilitating conditions and social influence are multi-dimensional attributes of organizations (Venkatesh et al., 2016). Social influence explains the trust that arises from seeing others who trust e-wallet usage. Facilitating conditions explain the trust caused by infrastructure that supports e-wallets well (Patil et al., 2018).

Furthermore, Shin (2009) stated that trust and perceptions of security influence the intention to accept an e-wallet. This research is strengthened by those conducted by Swilley (2010) and Do and Do (2020). Swilley (2010) stated that the fear of e-wallet users is when they lose their cell phones due to e-wallet transactions. According to Do and Do (2020), Gen Z users define trust as trust in the provider's good intentions to operate e-wallets honestly. Lan et al. (2020) stated that e-wallet users believe that their data shared during e-wallet transactions will be kept confidential. The results from Ahmad et al.'s (2021) research, that perceived security does not affect e-wallet acceptance. This happens because providers focus more on their systems and ignore consumer preferences regarding e-wallets.

Azizah et al. (2018, 2021), Istiyana and Triana (2019), Nelloh et al. (2019), and Santosa et al. (2021), conducted studies on the continued intention to use e-wallets in Indonesia, using a combination of constructs from several models, such as UTAUT2 and TAM, with the inclusion of additional constructs, for example, trust and security (Table 2.3).

2.5.4 Critical Success Factors

Besides focusing on acceptance and continuous usage, other studies have focused on the success factors of the e-wallet system. First, there must be a mass of consumers and merchants and a unique relationship between them (Apanasevic et al., 2016). Regardless of the technology, consumers will only be willing to use the e-wallet if there are merchants who accept these transactions. Merchants are reluctant to integrate e-wallets into their business due to high installation infrastructure, and to maintain the supporting infrastructure, such as card readers (Clark, 2005;

Moghavvemi et al., 2021). According to Rochet and Tirole (2003), merchants do not benefit from consumers who use e-wallets. However, the more frequently e-wallets are used, the more valuable they become to consumers and merchants (Rochet & Tirole, 2003). This potential for increased value underscores the importance of both parties benefiting, at least for a particular transaction, by providing incentives to change consumer behaviour and incentivizing merchants (Moghavvemi et al., 2021; Oh et al., 2006).

Second is the aversion to technology, which is a general thought that the use of technology is still a high risk (Kim & Peterson, 2017; McKnight & Chervany, 2002). This makes sense because knowledge about e-wallet and the internet has not spread much. People still choose to do transactions in cash, either by paying on the spot or transferring funds between bank accounts. People fear using the e-wallet because of security and privacy issues. Consideration of new short-range wireless technologies, such as NFC, Bluetooth, and Radio-frequency identification (RFID), can support easy and secure wireless communication. Consumers use mobile payment for online and offline micropayment purchases (Khan et al., 2017).

Third, government support plays a crucial role in disseminating e-wallet usage by empowering banks with extensive consumer network support (Clark, 2005; Sharma et al., 2019). This support can also be expanded by increasing the possibility of using e-wallets for telephone payments, parking meters, vending machines, public transportation, tolls, and other service payments. The government's backing provides a sense of reassurance and stability, fostering a conducive environment for e-wallet acceptance.

Fourth, the e-wallet, as a substitute for cash, still faces obstacles to being accepted by the public. This is related to consumers' lack of understanding about the e-wallet and the use of technology, which is increasingly making consumers feel inferior.

There are many ways to increase the frequency of using an e-wallet, such as increasing the number of merchants that provide e-wallet services and adding other media that use the e-wallet as payment. All the factors are covered under Indonesia's Indonesian Payment Blueprint Scheme (IPBS) 2025, a policy of the Indonesian government to support the transformation of payments from traditional to digital. One of the payment platforms being focused on is e-wallets, which has the potential to revolutionise the payment landscape and give the unbanked community access to digital payments.

Furthermore, the Indonesian government's support, as outlined in the IPBS 2025, play a crucial role in escalating people's confidence in using e-wallets. Their positive experiences while using e-wallets, supported by the government's initiatives, increase their trust in reusing e-wallets frequently. This increased trust and convenience ultimately change the way people make transactions, potentially leading to a widespread acceptance of e-wallets and transforming it into a habitual mode of payment.

2.6 Trust

Trust in using an e-wallet refers to a consumer against the merchant in online financial transactions. There is a security risk in the trustor and trustee relationship. However, there is an expectation that the benefits obtained by the trustee can reduce the risk during the transaction. The trustor's experience can continue to become a

habit for the trustor to conduct online financial transactions via an e-wallet. Online trust includes trust in technology, such as hardware, software, and infrastructure. This trust is built when people or organizations create good online interactions and are willing to accept insecure conditions (Giovannini et al., 2015). Bhati and Zoysa (2013) divided trust into two phases: trust initiation and trust development. The emergence of trust gives rise to initiatives to maintain consumers' confidence during a specific period (Bhati & Zoysa, 2013).

Trust begins with consumer awareness that e-wallets have higher benefits than costs, and how to maintain them using a reward system (Bhati & Zoysa, 2013; Bozic & Kuppelwieser, 2019; Wade & Robison, 2012). This view is in line with Chiu et al.'s (2020) findings that initial trust is perhaps the most important and challenging to achieve. On the other hand, it is easier to achieve in the development phase because consumers already have experience using e-wallets.

In prior studies about e-wallets, some researchers have stated that perceived security influences trust (Amoroso & Magnier-Watanabe, 2012; Kumar et al., 2018; Nelloh et al., 2019; Nilashi et al., 2015; Sfenrianto et al., 2017; Shin, 2009), because consumers feel insecure about transferring their funds online (Susanto et al., 2016; Shaw, 2014). Besides that, wide acceptance also influences trust, which means many merchants have already adopted e-wallet platforms. According to Moghavvemi et al. (2021), consumers find that if they can easily find a merchant providing e-wallet services, they feel secure and think the provider can be trusted (Moghavvemi et al., 2021). Another factor that influences trust is cost. Unlike perceived security and wide

acceptance, cost negatively influences trust. The cost can decrease consumers' trust, and one of the solutions to reduce cost is incentivizing consumers (Clark, 2005).

The following section discusses the three constructs related to this study.

2.6.1 Perceived Security

Perceived security is the belief that the provider will take necessary steps to ensure risk-free use of the technology (Shin, 2009). It is a key factor in building trust. As mentioned, security concerns are a major hurdle to the acceptance of m-payment services (Slade et al., 2015). Research has shown that perceived security can have a positive impact on trust (Schierz et al., 2010; Sfenrianto et al., 2017), offering optimism about the future of e-wallets.

According to Kumar et al. (2018), perceived security significantly influences trust in using e-wallets in India. In short, one of the factors for the success of e-wallets is the security confidence felt when using e-wallets. Perceived security refers to consumers' belief that a system is secure for transactions (Morosan & Defranco, 2016). In contrast to all the views earlier, Swilley (2010) stated that there is a negative attitude towards e-wallets based on the risk of losing stored data, including credit cards and other information stored on these devices (Swilley, 2010).

In other words, the safer the service offered, the greater the consumer confidence. Any factor that positively influences perceived security will increase the likelihood of consumers reusing the service. This influence of perceived security on the likelihood of reusing the service underscores the sustainability of e-wallets.

2.6.2 Incentives

Providing incentives is one way to increase trust. One of the causes of consumer distrust towards e-wallets is the high costs consumers have to pay compared to the benefits that consumers obtain. Providing incentives is likened to replacing costs incurred by consumers. Consumers can be said to be not incurring costs because the incentives offered by providers replace these costs.

Since the success of e-wallets depends on the number of consumers and merchants, it may be necessary to incentivise both parties to introduce e-wallets and convince them of their benefits (Chakravorti, 2000). The Octopus Card is one of the e-wallets in Hong Kong with the most extended duration and the most significant number of consumers because it incentivises consumers and merchants (Clark, 2005). Consumers will adopt and use information technology/information systems when they benefit from it. Benefits can take the form of incentives through offers, cash-back, coupons/discount codes, promotional offers, or loyalty points that marketers offer consumers in exchange for using their systems or technology. Google emphasises that consumers will use applications they have never used before when there is a good incentive offer. That makes incentives highly predictive of e-wallet acceptance among consumers (Malik & Rao, 2019; Santosa et al., 2021).

Incentives are associated with a company's desire to retain consumers. A company's loyalty program shows that the company is serious about providing e-wallet services to consumers so that consumer trust will increase. Incentives are programs from companies to retain consumers because getting new consumers is more complicated than retaining them (Bhattacharjee, 2001a). On the other hand, consumers usually

will only be loyal to a company if they feel the benefits, and are satisfied with the product. Because of its non-binding nature, Bhattacharjee (2001a) added the construct of loyalty incentives to see its effect on the intention to continue usage. The research results show that loyalty incentives do not significantly affect intention to continue usage, but the effect of interaction with perceived usefulness is significant (Bhattacharjee, 2001a).

Other studies have shown a significant and robust relationship between loyalty incentives and trust; therefore, maintaining consumer trust is crucial (Reuver et al., 2015). The use of incentives was tested by Bhattacharjee (2001a) and Seol et al. (2016). Bhattacharjee (2001a) showed that loyalty incentives significantly influence continuance through perceived usefulness. Seol et al. (2016) showed that incentives function as extrinsic motivators to attract consumers and build loyalty. Therefore, incentives are expected to moderate the influence of perceived usefulness on continued intention. This research examined the effect of incentives on continued intentions through trust because trust is the main factor that causes consumers to use e-wallets.

In Indonesia, incentives could reduce costs because reducing them will significantly influence trust. Incentives include points that can be used to substitute costs set by the government (Bayunitri & Fajar, 2019).

2.6.3 Wide Acceptance

The wide acceptance of e-wallets is a condition in which many consumers use e-wallets because they can easily find places that provide e-wallet platforms. This

success factor of e-wallet usage (Oh et al., 2006) is heavily influenced by consumer experience. For the dissemination of e-wallets to occur, consumers must not only use e-wallets, but also experience the benefits and feel safe during the transaction process (Shin, 2009). This sense of security arises from their trust in technology (Shin, 2009) and the laws that protect them (Omotubora & Basu, 2018).

The decision to use e-wallets for transactions becomes more pronounced as public acceptance of e-wallets grows, fostering a societal shift towards this mode of payment. This widespread acceptance encourages merchants to expand their network and increase the number of payment points for e-wallets (Abbas, 2017).

2.6.4 Trust Model

Trust is the level of consumer confidence in using e-wallets due to clear transaction procedures, provider reliability, and merchant reputation. E-wallet providers are responsible for enhancing consumers' trust by providing a secure feeling to e-wallet consumers to achieve wide acceptance of e-wallets. Factors that reduce trust and cost must be neutralised by incentivizing consumers. This study defines trust using three variables: perceived security, incentives, and wide acceptance (Figure 2.3).

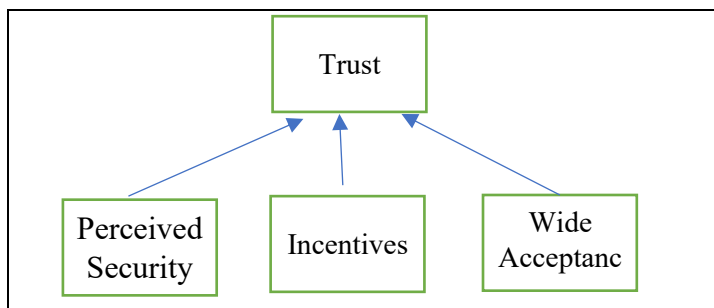


Figure 2.3 Proposed Trust Model

Finally, trust has been identified as necessary for facilitating consumer behaviour and supporting the continued intention of e-wallet usage. Moreover, it is expected to form a new habit for consumers to use e-wallets consciously.

2.7 Habit

Bezhovski (2016) predicted that e-wallets would inevitably surpass card payments in the future. He emphasised that trust and consumers' habits are pivotal to this growth, along with the need to enhance compatibility, use the latest technology, and address security and privacy concerns to ensure widespread acceptance.

The majority of research on habits has been in the psychological realm. In simple terms, Chimamiwa et al. (2019) stated that habits could be reflected in the duration and frequency of doing an activity (Chimamiwa et al., 2019). Past habits are expected to predict future habits because the frequency of past behaviour will reflect the strength of the habit and directly affect the future.

In the realm of information technology, consumers and traders have been traditionally hesitant to change their payment preferences (Chakravorti, 2000). However, the introduction of incentives, the promotion of e-wallets as a new payment method, and continuous persuasion of consumers and traders, can pave the way for widespread e-wallet acceptance (Chakravorti, 2000).

The strength of habits continues to influence many behavioural intentions even after people gain experience. Once a behaviour becomes a habit, it is performed automatically and unconsciously. When a habit is deeply ingrained, people tend to disregard external information or rational strategies (Lin & Wang, 2006). Habits are

formed through automatic learning (Limayem et al., 2007). Another way to define a habit is as automatic behaviour. Typically, when people engage in habitual behaviour, they are not consciously aware of it. Li (2016) focused on virtual communities and found that consumers who have formed habitual behaviour, might repeat activities unconsciously in a stable context. The formation of consumer habits can lead to increased positive consumer feelings (Li, 2016).

2.8 Theoretical Framework

A theoretical framework is a structure that supports a theory in a research study. Its description can explain the theoretical concepts and definitions that form the basis of the research, and show its understanding. This study, based on a thorough and comprehensive literature review, not only adds a trust variable to the ECM model, but also explores it by adding several variables as antecedents of trust, instilling confidence in the research's credibility.

2.8.1 Expectation-Confirmation Theory (ECT)

The ECT is a theory that describes repurchase behaviour and recommendation intentions in marketing research (Oliver, 1980), both of which are solid elements for reusing information systems (Fu et al., 2018). The ECT begins with confirmation between consumer experience and expectations before deciding on continued use. Before deciding to continue using the e-wallet, consumers must confirm their expectations against initial expectations. This confirmation can lead to consumer satisfaction or dissatisfaction (Hsiao, 2018). For example, if the satisfaction experienced by the consumer has led to the desire to continue using the e-wallet. The

confirmation process is the rationale for the use of the ECT (Oliver, 1980). The ECT emphasises the importance of confirmation/disconfirmation of an information system before deciding to continue using the system.

The ECT focuses on consumer satisfaction as a function of expectation and disconfirmation because it affects attitude changes and repurchase intentions (Figure 2.4). ECT use describes post-purchase satisfaction (Bhattacharjee, 2001a). Satisfaction is confirmation of consumers' expectations; it has a positive value, meaning the buyer is satisfied and intends to purchase a second time. On the contrary, a negative value indicates that the buyer is unsatisfied and will not repurchase. The ECT explains three main functions: the buyer's expectations before making a transaction, the buyer evaluates the performance and benefits of the goods purchased, and the buyer's initial expectations confirm the performance. If it is a positive value, the buyer will be satisfied and repurchase, and vice versa.

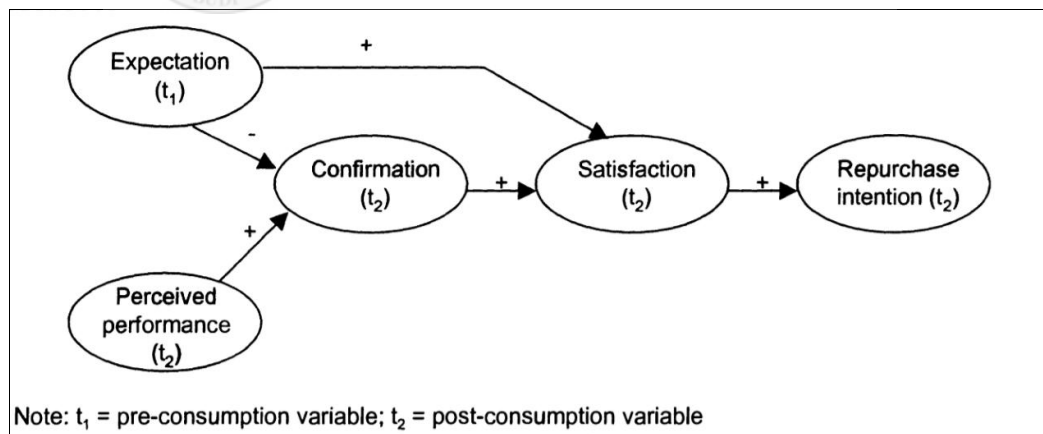


Figure 2.4 Expectation-Confirmation Theory

Source: (Bhattacharjee, 2001b)

Figure 2.4 vividly illustrates the central role of consumer expectations in the ECT framework. The sequence of the ECT framework begins with the consumers'

expectations in the early stage of a specific product or service. These expectations serve as the basis for consumers to accept and use the product or service. As they engage with it, they form perceptions of its performance, and then evaluate it, comparing it to their original expectations, and determining the degree to which those expectations have been confirmed.

Researchers have unanimously acknowledged that the evaluation of expectations is a precursor to satisfaction, which positively assesses a technology's performance. In the context of the ECT, satisfaction is the confirmation of consumers' expectations. It has a positive value, meaning the buyer is satisfied and intends to purchase a second time. This satisfaction is crucial in building and retaining consumers over the long-term. Satisfied consumers are more likely to make repeat purchases, reinforcing satisfaction's importance in consumer retention.

Amoroso and Magnier-Watanabe's (2012) research on e-wallet acceptance focuses on factors, such as trust, ease of use, usefulness, facilitating conditions, and social influence. The researchers then went on to study the continued use of ECT. They used ECT to explain ex-post expectations, representing perceived usefulness, ease of use, and perceived safety (Syadzwan & Abdul, 2021). In addition, Duanmu et al. (2018) investigated dynamic adaptive streaming over hypertext transfer protocol (HTTP); Fu et al. (2018) investigated the loyalty of public transport consumers; Li et al. (2019) researched continued intentions to use social fitness tracking applications; Chiu et al. (2020) examined consumers' continued intentions to use health and fitness applications; and Lee and Kim (2020) applied ECT to study online reviews of restaurants. These studies demonstrate the versatility of the ECT framework in

understanding and predicting consumer behaviour in various contexts, such as e-commerce, public transport, and health and fitness applications.

It is imperative to revise the ECT, as the theory currently overlooks the potential differences between expectations before and after utilising an information system (Bhattacharjee, 2001b). Expectations post-utilisation is more realistic compared to expectations based on others' experiences. Bhattacharjee (2001b) proposed a transition from repurchases to post-acceptance within the ECT framework, now known as the ECM (Figure 2.5). This shift from the ECT to the ECM framework marks a significant advancement in consumer behaviour research, as it takes into account the evolving nature of consumer expectations and the influence of actual usage on these expectations.

2.8.2 Expectation-Confirmation Model (ECM)

The ECM consists of four variables: (i) perceived usefulness; (ii) confirmation; (iii) satisfaction; and (iv) continued intention (Bhattacharjee et al., 2008). The model focuses on three main ideas: (i) level of consumer satisfaction; (ii) confirmation of expectations; and (iii) expectations after initial acceptance, which are represented by perceived usefulness. Figure 2.5 illustrates that consumers have pre-acceptance expectations which are typically based on opinions or information from others disseminated through mass media. These expectations are then confirmed through consumer experiences after using new technologies. Consumers' first experience will confirm earlier expectations, and can influence post-acceptance expectations. Post-acceptance expectations can increase if consumers find the benefits of a new product or service beyond their initial expectations (Bhattacharjee et al., 2008). Increasing

expectations that are in line with consumer predictions will lead to satisfaction, and so, perceived usefulness and satisfaction are individual-level perceptions to continue using information technology/information systems (Sorebo, 2004).

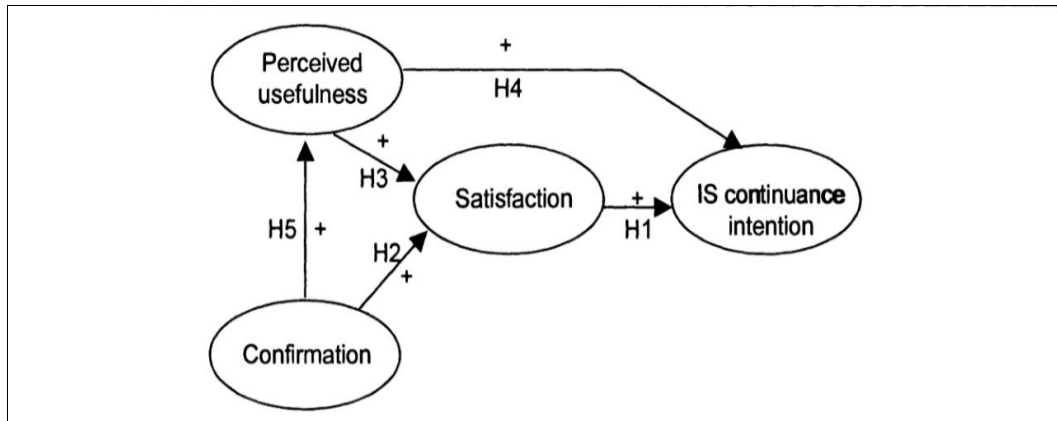


Figure 2.5 An Expectation-Confirmation Model

Source: (Bhattacharjee, 2001b)

Many scholars have made impactful modifications to the ECM by adding variables or integrating the ECM with other models. Scholars have added other variables, such as loyalty incentives (Bhattacharjee, 2001b); perceived service quality and perceived trust (Akter et al., 2013; Syadzwan & Abdul, 2021); system quality, service quality and flow (Zhou, 2013); and habit and continuity of behaviour (Chen & Li, 2017). The researchers have also combined the ECM with the TRI (Chen et al., 2013); ECM with TAM or Extended ECM-Information Technology (EECM-IT) (Hong et al., 2006; Malik & Rao, 2019); and ECM with flow and motivation theory (Sarkar & Khare, 2019). They have combined ECM with the TAM and the Theory of Planned Behaviour (TPB) (Al-Emran et al., 2020), and the flow theory (Lee, 2010).

2.8.3 ECM Modification

The ECM has been widely used to examine factors that constantly affect the intention to use technology in various contexts. Several studies have integrated other factors into the ECM, such as loyalty incentives and trust. Researchers have argued that some theoretical extensions may be required for ECM to better explain consumers' continuance behaviour toward an information system in its various contexts (Hsu & Lin, 2015).

2.9 Conceptual Model

There are some studies on e-wallets in several places in Europe that have high internet penetration rates, as well as other studies in Asia. These studies have focused on the obstacles that the country faces in introducing e-wallets as a payment method and getting its people to continually use e-wallets as a step towards a cashless society. This study started from the assumption that someone who has used an e-wallet will intend to continue to use it and make payment activities using the e-wallet a habit. This study used the ECM as an initial model to describe the reuse of e-wallets, where based on previous research, adding trust can strengthen the use of e-wallet technology for a person's financial activities. Several obstacles that cause someone to be reluctant to use an e-wallet were anticipated, so that they become a motivating factor for someone to reuse an e-wallet. Users' fear of e-wallet failure can be anticipated by providing additional security when transacting using an e-wallet; high costs when making e-wallet transactions can be neutralised by providing incentives or expanding the use of e-wallets to all levels of society. Ultimately, the condition of using e-

wallets repeatedly can foster the habit of using e-wallets for every payment transaction.

The process was meticulous, beginning with a thorough literature review to define the essential and relevant variables in this study, then conducting a theoretical study to understand the relationships between these variables, leading to the formulation of hypotheses. This rigorous approach culminated in the development of the model proposed for this study, the e-wallet Consumer Continued Intention Model.

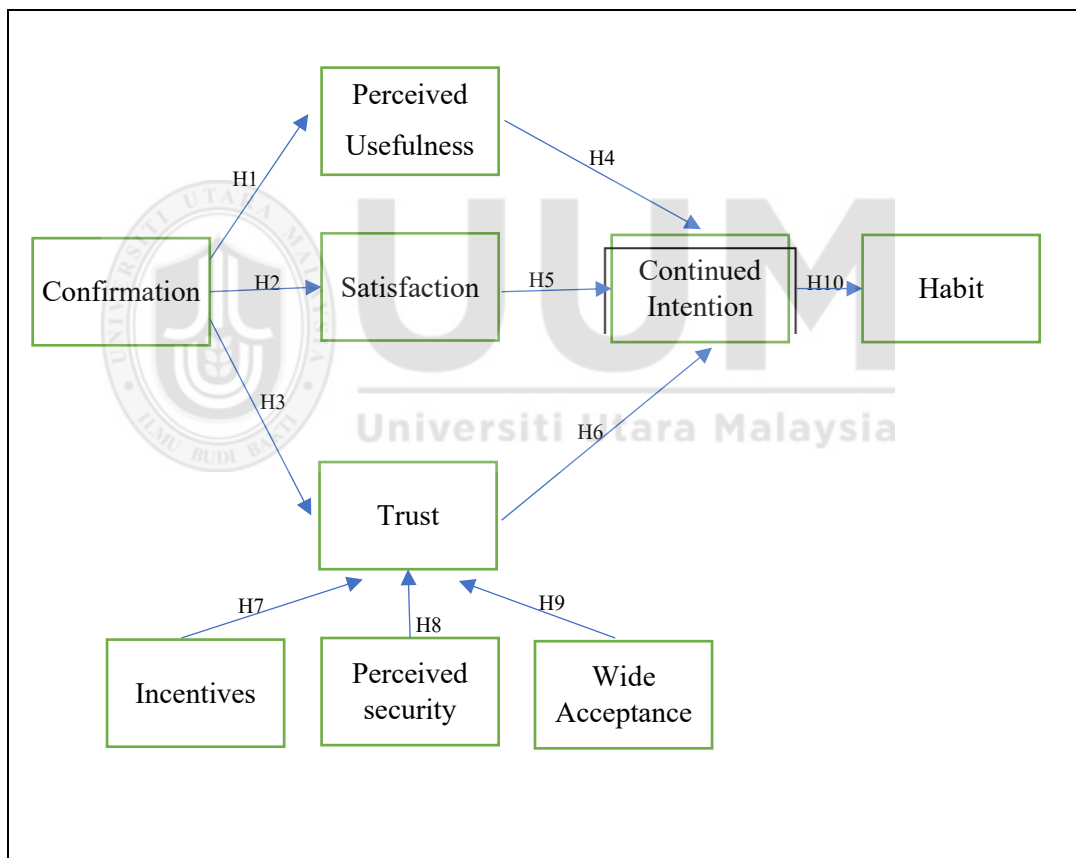


Figure 2.6 E-wallet Consumer Continued Intention Model

2.10 Research Hypotheses

The research hypotheses was developed based on the research questions, theoretical framework, and related theories.

2.10.1 Relationship between Confirmation and Perceived Usefulness, Satisfaction, and Trust

Confirmation, a concept of significant importance in this research, is defined as the act of confirming or strengthening, establishing, convincing, or upholding. Oliver (1980) defined confirmation as a function between consumers' expectations before purchasing and confirmation of their knowledge about a product or service after actual use. In the context of e-wallets, confirmation is described as the level of consumer understanding about e-wallets and their use, and the level of consumer expectations regarding e-wallet performance, which can exceed or not meet consumer expectations and standards. It plays a crucial role in shaping consumers' perceptions. A key aspect of this is the comparison of consumers' expectations before experiencing using them – whether they are the same or different from initial expectations. This emphasis on the role of confirmation underscores the significance of the research topic.

Perceived usefulness, a critical theoretical concept, is the extent to which consumers believe that using the system will result in benefits obtained by consumers (Lee & Kwon, 2011). The link between confirmation and perceived usefulness underpins the theoretical framework of this research. When consumers who have never used an e-wallet use it, they will have certain expectations regarding the benefits that the e-wallet will fulfil after using the e-wallet; consumers feel the benefits of the e-wallet, such as not having to bring coins (Mombeuil, 2020; Susanto, et al., 2022); the payment process is relatively easy and fast; and there is a history of transactions made by consumers. This study defines perceived usefulness as the benefits consumers feel when making transactions using e-wallets compared to the duration and transaction

costs. The extent of benefits of using an e-wallet is the influence of confirmation and perception of usefulness. The theoretical framework, which is crucial, guides the formulation of the following hypothesis:

H1: Consumers' confirmation has a positive effect on consumers' perceived usefulness of the e-wallet.

Consumers always evaluate their choices; if they meet their needs, they will continue to use the e-wallet (Kim & Tadisina, 2007). When e-wallet services are better than expected, they bring about consumer satisfaction; if they do not meet consumer expectations, there will be no satisfaction. The ECM clarifies that consumer satisfaction is determined by confirmation after using the e-wallet, and satisfied consumers have a stronger will to continue using the e-wallet (Kim et al., 2019). So, this research defines satisfaction as the level of consumer acceptance and/or comfort after using an e-wallet, providing a clear and precise understanding of this concept. This leads to the following hypothesis:

H2: Consumers' confirmation has a positive effect on consumers' satisfaction with the e-wallet

Confirmation is a starting point for consumers' will to use e-wallets, and it requires providers and merchants to carry out e-wallet transaction activities following their expectations. On the contrary, there are no guarantees that the e-wallet will meet consumers' expectations. Consumers must be concerned with the possible opportunistic behaviour of e-wallet providers and the loss of their money. Merchants and providers must be able to build consumer trust in risks that may occur during the

e-wallet transaction process, such as network instability (Kim & Kang, 2012). Then, consumers can accept certain risks based on their belief that the transaction will meet their expectations (Pavlou, 2003). Confirming expectations in e-wallet usage will improve consumers' trust towards the service. This leads to the following hypothesis:

H3: Consumers' confirmation has a positive effect on consumers' trust in the e-wallet

2.10.2 Relationship between Perceived Usefulness and Continued Intention

According to Sahin and Rogers (2006), consumers will accept an innovation if it provides specific benefits to them compared to existing solutions (Sahin & Rogers, 2006). In the ECM context, this usefulness is reflected in perceived usefulness; hence, perceived usefulness is defined as the level of consumer confidence in the benefits provided by the e-wallet. This research suggests that e-wallet consumers will continue to use it if they have a high level of confidence in its positive outcomes. This leads to the following hypothesis:

H4: Consumers' perceived usefulness has a positive effect on consumers' continued intention of e-wallet usage

2.10.3 Relationship between Satisfaction and Continued Intention

Satisfaction is, "the good feeling that one has achieved something or when something that one wants does happen; something that gives one this feeling". Satisfaction is obtained from consumers' evaluations after conducting e-wallet transactions that produce positive or negative feelings (Bhattacharjee, 2001b). The ECM supports the

belief that satisfaction with a product or service is the primary motivation for continued usage (Oliver, 1980). Bhattacharjee (2001b) showed that the direct relationship between satisfaction and intention to continue is at the core of the information system. In this research, satisfaction is the consumers' feeling prior to information systems use. Consumers with higher satisfaction levels have stronger intentions to use it (Bhattacharjee, 2001b). In this research, if e-wallet consumers are satisfied with it, they will continue to use the e-wallet. This leads to the following hypothesis:

H5: Consumers' satisfaction has a positive effect on consumers' continued intention of e-wallet usage

2.10.4 Relationship between Trust and Continued Intention

Trust is the assured reliance on someone or something, a confident dependence on the character, ability, strength or truth of someone or something. Earlier researchers have proven that trust is essential to acceptance and continued usage (Khalilzadeh et al., 2017). In this research, trust is defined as consumers' confidence level in switching their hard cash into digital form and using e-wallet services due to clear transaction procedures, provider reliability, and merchant reputation. Trust, as an antecedent of intention to use the e-wallet (Shin, 2009), plays a crucial role in the logical progression of this argument. Importantly, consumers who have trust are more likely to continuously use the e-wallet, a critical factor in the success of e-wallet services. This leads to the following hypothesis:

H6: Consumers' trust has a positive effect on consumers' continued intention to use an e-wallet

2.10.5 Relationship between Incentives and Trust

Based on previous research, it is challenging to retain consumers, and that is the reason for creating incentive programs to maintain consumers (Bhattacharjee, 2001b). Incentives can be defined as additional perks given by the company to gain the loyalty of consumers. One of the success factors of the e-wallet is attractive incentives to consumers and merchants, the reason being to change their behaviour toward e-wallet usage (Bhattacharjee, 2001a; Clark, 2005; Seol et al., 2016). Clark (2005) concluded this from her research on the Octopus Card, a widely used contactless smart card system in Hong Kong, and Navy CashTM, a similar system used by the US Navy. Oh et al. (2006) found that OZPay offers incentives to consumers but not merchants; OZPay's activity was discontinued in 2005.

Bhattacharje (2001a) suggested that while incentives may not be the sole motivator of behaviour, they can still significantly influence consumer decisions. Even if an incentive is not directly valuable to an individual, it can still motivate behaviour that contributes positively to their overall utility. This understanding is crucial, as it highlights the need for a more nuanced approach to understanding the relationship between incentives and consumer behaviour (Bhattacharjee, 2001a).

In this study, an incentive is defined as the level of trust a consumer has in the e-wallet provider's commitment to offering rewards, cash-back, and other incentives to reduce the costs of using an e-wallet. Previous studies have not found a significantly

direct effect of incentives on continued intention. Hence, this research examines whether or not incentives influence continued intention through trust. This leads to the following hypothesis:

H7: Incentives have a positive effect on consumers' trust in the e-wallet

2.10.6 Relationship between Perceived Security and Trust

Security is, "the quality or state of being secure: i.e., freedom from danger, fear, anxiety or care". This study defines perceived security as the consumers' belief that a system is secure to perform transactions. Security refers to consumers' perception that the platform will fulfil security requirements during the transaction process. Prior studies have indicated that perceived security is an essential antecedent of trust, meaning that trust is built on the foundation of perceived security (Shao et al., 2018; Yousafzai et al., 2003). Trust represents consumers' confidence that their data is secure, and their payment will be credited to the merchant correctly. Thus, perceived security is defined as consumers' perception that e-wallet service mechanisms will be protected by information technology and legal capabilities. Indeed, security concerns play an important role in Internet banking success (Hanafizadeh et al., 2014). Moreover, experienced consumers may expect a higher level of security. This leads to the following hypothesis:

H8: Perceived security has a positive effect on consumers' trust in the e-wallet

2.10.7 Relationship between Wide Acceptance and Trust

Wide acceptance is the condition that e-wallets are already accepted and have mass consumers and merchants. There has yet to be any research about this construct.

Arango et al. (2015) stated that consumers would only be willing to use e-wallets if there are merchants provided e-wallet payments. In contrast, merchants will not invest in e-wallet devices if only a few consumers use them. This leads to the following hypothesis:

H9: Wide acceptance has a positive effect on consumers' trust in the e-wallet

2.10.8 Relationship between Continued Intention and Habit

Continued intention, as defined by Lai et al. (2016), is consumers' intention to continue using information systems. In the context of e-wallet usage, this study defines continued intention as the willingness of consumers to reuse e-wallets and explore all e-wallet functions. This willingness is significantly influenced by the consumers' trust in the e-wallet's functions, in addition to their realisation of its benefits and satisfaction with it. This trust plays a crucial role in increasing the frequency of e-wallet use.

Habit is, "a behaviour pattern acquired by frequent repetition or developed as a physiologic function and shows itself in regularity". Habits represent behavioural tendencies that automatically developed in the past even though the individual did not want to perform them (Limayem et al., 2003). Limayem et al. (2003) said habit is a post-continuance intention, in contrast to Morosan and DeFranco (2016), who stated habit is a predictor of intention. This study defines a habit as the extent to which consumers use e-wallet services automatically because of their benefits, wherever and whenever, and the availability of sufficient funds to carry out transactions using e-wallets. This leads to the following hypothesis:

H10: Consumers' continued intention of e-wallets usage has a positive effect on consumers' habit of using it

2.11 Chapter Summary

This chapter explains consumers' continued intention to use e-wallets in detail, including an introduction, theoretical framework, and the proposed model. In the introductory section, an overview of the contents of Chapter two was presented. Previous studies have highlighted issues and challenges regarding e-payment systems, e-wallets, trust and habits. The theoretical framework, including the TAM, the UTAUT model, and the ECM, highlight essential factors, such as confirmation, satisfaction, perceived usefulness, trust, perceived security, and continued intention. This research enriches the existing literature by studying initial beliefs when converting money to digital form, beliefs to continue using e-wallets with ECM, and additional variables. The chapter proceeds with the formulation of hypotheses, where a research model was presented, and 10 hypotheses were developed.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter begins with an explanation of the research foundation, followed by research philosophy and methodology. This chapter also provides information about research design, strategy, unit of analysis, population and sample, data collection methods, research process, data collection, and analysis. The research process outlines problem identification, research design, and questionnaire design. The final section serves as the overall summary of this chapter.

3.2 Research Foundation

A researcher makes many assumptions in his/her research to make it easier to understand the scope of the research (Burrell & Morgan, 2019). The assumptions include ontological, epistemological, and axiological assumptions. A mature and consistent set of assumptions form a credible research philosophy, which supports the choice of methodologies, research strategies, data collection techniques, and analytical procedures. Ontology refers to assumptions about the nature of reality. Ontological assumptions shape how to see and study the object of the research. These objects in business and management include organization, management, individual work-life, corporate events, and artefacts (Saunders et al., 2019). Epistemology provides assumptions about knowledge, validation, and legitimacy, and how researchers can communicate their knowledge to others (Burrell & Morgan, 2019). This diversity of epistemology provides a wide choice of methods. Axiology refers to the role of values and ethics. Researchers face one of the main axiological choices by seeing the impact of values and beliefs as a positive thought.

In this current study, the intention is to investigate the factors that influence continued intention to use the e-wallet in Indonesia. There are some assumptions in terms of the relationship between the variables, such as confirmation and perceived usefulness, and continued intention and habit. The research method discussed in this chapter explains in detail the process of investigating the relationship. The onion framework (Saunders et al., 2019) was applied as the research methodology.

3.2.1 Research Philosophy

Research philosophy refers to belief systems and assumptions about knowledge development (Saunders et al., 2019). Knowledge is a product of thinking based on what is known, how to acquire knowledge, and the value of knowledge. Knowledge development can be through survey methods, statistical measurements, explanations, and data tabulation. Research philosophy contains essential assumptions about how researchers view the world; these assumptions support research strategies and methods. Philosophy of knowledge is based on data acquisition, collection, analysis, and interpretation based on the source, nature, and development of data.

Figure 3.1 The research onion proposed by Saunders et al. (2019):

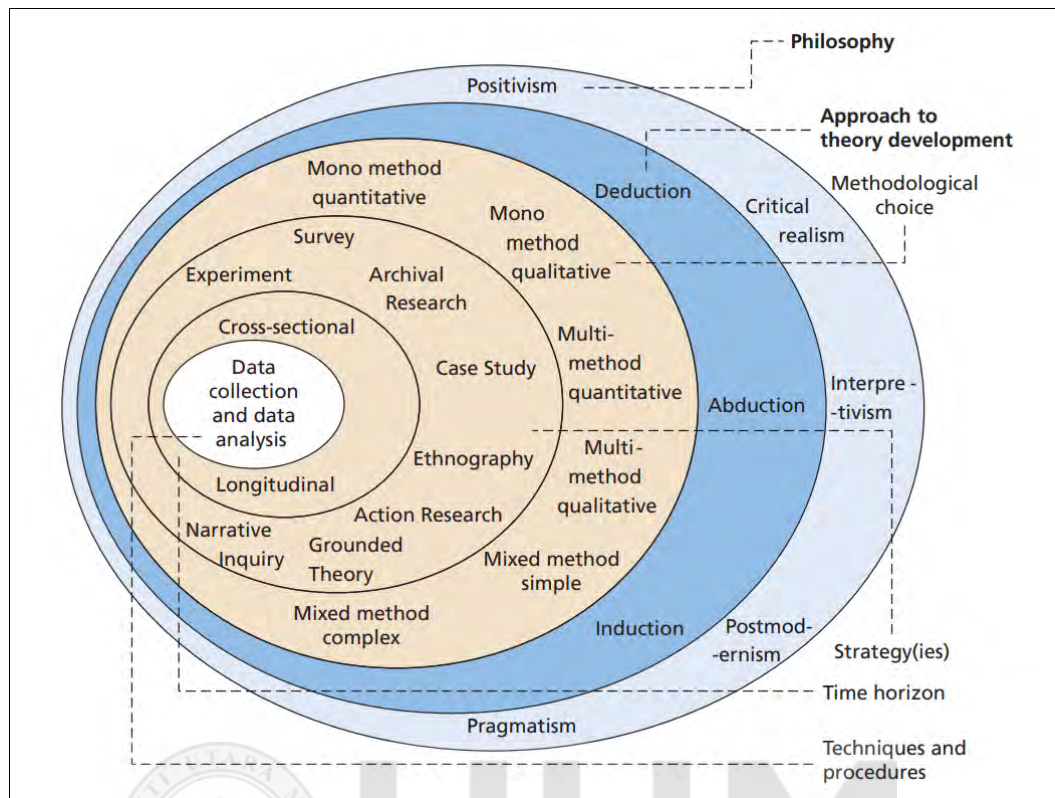


Figure 3.1 Research Onion

Source: (Saunders et al., 2019)

Based on Figure 3.1, there are five research paradigms in the academic realm, namely the paradigm of positivism, critical realism, interpretivism, postmodernism, and pragmatism. Positivism assumes that general rules control social events that allow researchers to predict, explain, and handle social phenomena (Saunders et al., 2019). Positivism emphasises quantitative data and uses statistical calculations to formulate hypotheses as causal relationships between variables. In addition, questionnaires are used in the investigation process to conduct statistical data collection analysis.

This study focuses on finding facts and observable regularities. The philosophy of this study is to observe phenomena, identify causal relationships in the data, and make generalisations to predict each phenomenon. This study applied positivism as

a theoretical perspective, which uses deductive reasoning to understand complex issues, emphasizing theory testing through carefully crafted research designs and objective metrics (Sekaran & Bougie, 2016). Within this framework, a positivist attitude requires an objective focus, setting aside subjective elements, such as emotions, feelings, and thoughts.

The main characteristic of positivism lies in its emphasis on quantitative data, and utilising statistical calculations to articulate hypotheses that describe causal relationships between variables. In this study, there are ten hypotheses to explore the impact of continued intention to use e-wallets on consumer payment habits.

Deductive reasoning is an integral part of this research approach, which facilitated the evaluation of existing theories and whether satisfaction, perceived usefulness, and trust influence continued intention. Do perceived security, incentives, and wide acceptances influence trust? Will continued intention affect payment behaviour?

The research design is a comprehensive blueprint for answering the research questions (Sekaran & Bougie, 2016). This design describes clear objectives derived from the research questions, determines data sources, and outlines the methodology for data collection and analysis (Saunders et al., 2019). It includes selecting data collection methods, sampling techniques, measurement tools, and data analysis procedures (Creswell, 2014).

There are three principal research methodologies: qualitative, quantitative, and mixed methods. The choice between quantitative and qualitative approaches depends on the philosophy of the study. According to Creswell (2014), if a study leans

towards quantitative research, then the study uses a quantitative approach, and vice versa. Mixed methods research combines quantitative and qualitative paradigms. The choice of research methodology must be aligned with the overall research strategy and philosophy.

As Saunders et al. (2019) articulated, a well-structured framework is characterised by quantitative research design and rigorous reliability and validity testing. In quantitative research, the use of deductive theory is paramount. This theory positions the research at the beginning of the proposed study, with the goal not only to develop a theory but also to test or verify it. Thus, theory serves as a basic framework guiding research procedures and data collection (Creswell, 2014). The role of deductive theory in this context is crucial, as it guides the research from the outset and helps in the development and testing of the theory.

This study adopted a quantitative methodology to explain the relationship between continued intention and habit formation related to e-wallet payments in Indonesia. The use of e-wallets has been accepted in Indonesia, primarily since e-wallets have been known in Indonesia since 2007, and there is an increase in the number of e-wallet accounts every year. This study proposed a model that explains whether the factors that drive the continued intention to use e-wallets will lead to habitual behaviour among consumers. As previously mentioned, data were collected using a questionnaire, and the collected responses underwent analysis using the Partial Least Squares-Structural Equation Modeling (PLS-SEM) approach facilitated by SmartPLS. The onion research framework, which provides a clear structure for the research, was used to guide the study. This study used a survey by distributing

questionnaires to respondents. Surveys serve as a system for collecting information about individuals, to describe, compare, or explain their knowledge, attitudes, and behaviours (Sekaran & Bougie, 2016). Specifically, this survey adopted a one-time cross-sectional approach. The questionnaire was prepared and distributed via the WhatsApp platform. Table 3.1 shows the details of this current study based on the onion research framework.

Table 3.1
Summary of the Research Approaches

Quantitative Approaches	
Philosophical research	• Positivist
Methods	• Survey • Close-ended questions, predetermined approaches, numeric data
Practices of research	• Identifies variables to study. • Relates variables in question or hypotheses. • Uses standard validity and reliability. • Observes and measures information numerically. • Uses unbiased approaches. • Employs statistical procedures

The research context focuses on investigating factors influencing consumers' continued intention of e-wallets usage in Indonesia. Consequently, the respondents targeted for this study comprise individuals with prior e-wallet experience, regardless of age, gender, educational background, or occupation. This study adopted an individual-centric analytical approach, probing the underlying reasons why individuals in Indonesia have yet to incorporate e-wallet payments as a habitual practice.

3.3 Research Process

This section outlines a series of systematic research procedures with three distinct phases: formulating and clarifying the topic; designing the research; and collecting and analyzing data. The initial phase, which is of paramount importance, involved identifying and understanding the social challenges related to the e-wallet system in Indonesia, particularly the e-wallet platform. The insights gained from this initial observation were then compared to existing literature on e-wallets to determine the factors influencing their intention to continue using e-wallets, and to understand why e-wallets have not yet become a habit among consumers.

The data analysis unit and sampling criteria were determined in the second phase. Respondents were selected based on consumers' previous e-wallet usage experience, a key factor that is aligned with the research model. Building on the findings from the initial phase, the research continued to develop a measurement instrument, which was then validated through expert review and preliminary studies. The questionnaire was created using Google Forms media, a facility that provides online data storage. The results of the questionnaire were stored in the form of spreadsheet files that could be processed statistically. The validated questionnaire was then disseminated online through several WhatsApp groups, and lecturers in Indonesia were members of that group.

The final phase involved rigorous statistical calculations via SmartPLS, utilising the PLS-SEM model. The results of these calculations were meticulously analysed and interpreted, culminating in the formulation of a comprehensive research report.

Figure 3.2 shows the three phases of research process in this study:

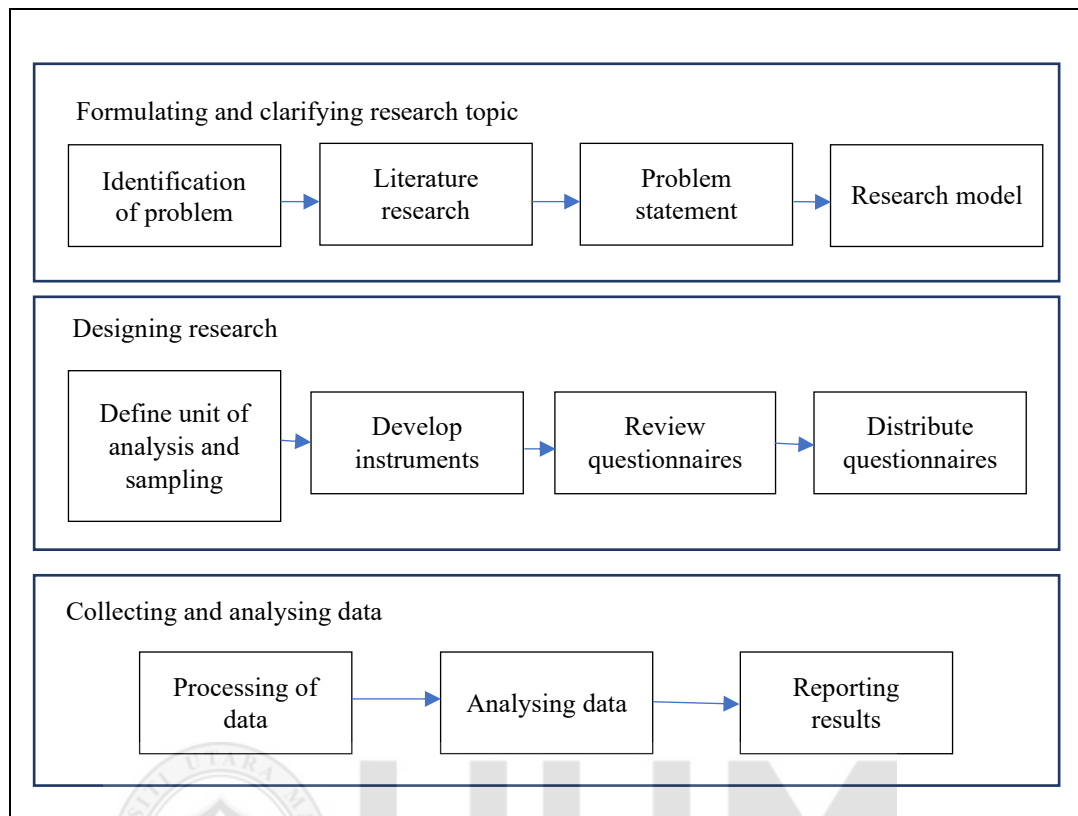


Figure 3.2 Three Phases of Research

The next sections discuss the details of the three phases.

3.3.1 Formulating and Clarifying the Research Topic

Problem identification was the basic step in this study, to establish how trust influences continued intention to use e-wallets and other determinants that drive this intention. Furthermore, this study examined whether or not repeated e-wallet use will lead to habitual e-wallet payment practices. This study distinguished these factors through a comprehensive and thorough literature review, ensuring a rigorous examination of empirical evidence in the Indonesian context. Based on this review, a conceptual model was developed to explain the determinants influencing continued intention to use e-wallets and to investigate whether or not continued intention influences e-wallet payment habits, as has been identified in previous studies. The

‘Consumer Continued Intention’ model integrates the ECM framework with the Habit construct, to investigate whether or not continued e-wallet use fosters new transactional habits among consumers.

Furthermore, this model complements the ECM with the trust factor, examining how trust influences re-engagement with e-wallets. Trust is a crucial element in the e-wallet ecosystem, often assumed to emerge spontaneously. However, this study identified specific factors that influence individuals’ trust in e-wallets. These factors (perceived security, incentives, and widespread acceptance of e-wallets) were explored in this study and integrated into the model to provide a comprehensive understanding of trust's role in e-wallet usage.

3.3.2 Designing the Study

The context of this study involves investigating the factors influencing consumers’ intention to continue using e-wallets and examining the intention to continue forming habits among e-wallet consumers in Indonesia. All these factors are reflected in the model of this study after the study was conducted. This study involved a large number of respondents through an online questionnaire method.

The advantages of online questionnaire includes its ease of distribution, facilitated by posting a link on the website, which helped gain a clearer understanding of respondents’ opinions and preferences. A significant benefit was the comprehensive geographical reach, which allowed respondents to participate at their convenience from various locations. Automated survey processing further saves costs, time, and energy. However, the online questionnaire has limitations, primarily related to sampling. For example, low response rates can challenge the representativeness and

generalisability of findings because survey respondents may not fully represent the population.

Stutely (2014), as cited in Saunders et al. (2019), suggested that a minimum sample size of 30 respondents is aligned with the basic requirements of PLS-SEM. However, a small sample size may only be generalizable to some populations. Kline (2016) suggested a minimum sample size of 200 respondents. Given the unknown population size for this study, the samples ranged from 30 to 500 respondents.

3.3.2.1 Unit of Analysis, Population and Sample

The selection of the type of unit depends on the research interest, research questions, and the individual. The focus of this study is on app-based e-wallets. Sampling units refer to elements or groups of elements available for selection at various stages of the sampling process. Population refers to the entire group of people, events, or phenomena that interest the researcher in drawing conclusions based on statistical samples (Sekaran & Bougie, 2016). The sample represents a portion or part of the population. The researcher must be able to generalizable conclusions about the target population by studying the sample. The appropriate sample size must be carefully determined; with an appropriate sample size, research findings become more reliable (Sekaran & Bougie, 2016). An adequate sample size is essential to generalise findings from a random sample effectively. While some argue that larger sample sizes increase the generalisability and validity of conclusions, caution is needed. Hair et al. (2018) and Kline (2016) warned that large samples can produce statistically significant results with little substantive significance. This perspective concurs with Hulland et al. (2018) that a low response rate only sometimes indicates a sample's

unrepresentativeness. According to the Krejcie & Morgan table, for a population exceeding one million, a sample size of 384 is sufficient when using simple random sampling (Memon et al., 2020). In addition, Hair et al. (2017a) suggested using a power statistics table to determine sample size, recommending a statistical power of 80% and a significance level of 5% to detect a minimum R-squared of 0.25 (Hair et al., 2017a).

According to BI, they only have e-wallet data regarding the number of e-wallet accounts used by Indonesian residents, and not the number of residents who use e-wallets. This data is significant as it provides a snapshot of the e-wallet landscape in Indonesia. No regulations limit residents to owning several e-wallet accounts, and so, the number of e-wallet accounts may exceed the total population in Indonesia. Considering the conditions on the island of Java, which has a population of over one million and no data regarding the exact number of e-wallet users, a sample size of between 50 and 500 respondents can have adequate statistical power.

This study used a simple random sampling method as a probability sampling technique, targeting consumers of application-based e-wallets who have previously used the service, and voluntarily responded to the survey questionnaire. There was no coercion to fill out the research questionnaire, nor was there any enticements to persuade someone to participate in this research.

The questionnaire includes demographic questions regarding gender, age, education level, monthly expenditure, and income. These demographic factors were considered as they may influence the usage and perception of app-based e-wallets. Accepting the survey method allows for explaining causal relationships between constructs and

offering statements that can be generalised to the research environment (Akter et al., 2013). This study used a cross-sectional design to collect information from a sample population.

3.3.2.2 Measurement Development

In quantitative research, measurements obtained from a positivist perspective are based on objective measurement methods, specifically by collecting data through a set of structured closed-ended questions with sequentially ordered options. This study employed a 5-point Likert scale across all variables. According to Krosnick and Fabrigar (1997), the 5-point Likert scale is more valid and reliable than shorter scales. This research adopted the Likert scale, to facilitate survey respondents' comprehension, and it is aligned with prevalent information systems research that has employed this scale (Chatterjee & Bolar, 2019).

Once the questionnaire was constructed, reliability and validity tests were conducted, encompassing both face and content validity. Expert reviews were employed to assess the questionnaire's content. Content validation involved experts with expertise in e-wallet studies. Their feedback and comments informed modifications, aligning certain items with established literature guidelines.

This research focused on the continued intention of e-wallets usage in Indonesia, employing a questionnaire to address the research questions. Factors influencing the continued intention of this technology were referenced from Bhattacharjee (2001b), Chandra et al. (2010), Susanto et al. (2016), and Shaw (2014). Additionally, the introduction of trust as a factor in the ECM drew upon Chandra et al. (2010) and Kim et al. (2010). References for identifying factors enhancing consumer trust were from

Susanto et al. (2016), Chandra et al. (2010) for perceived security, and Bhattacharjee (2001a) for incentives. The dependent variable questions were based on Limayem et al. (2003).

In the construction of the questionnaire, questions were adopted from existing instruments, modified from other questionnaires, and tailored to the Indonesian context. Scale items were adopted from the literature, specifically from Bhattacharjee (2001a, 2001b) for constructs present in the ECM. Trust and antecedent items were sourced from Chandra et al. (2010) and Kim et al. (2010). Only the wide acceptance items were not directly adopted from prior studies.

The questionnaire comprises five sections: initial statements, criteria questions, demographic profile, e-wallet usage questions, and measurement section (see Appendix A). The initial statements provide a brief overview of e-wallets and outline the questionnaire's contents. Section A includes criteria questions to determine respondents' eligibility to continue completing the questionnaire. Respondents were asked whether or not they had ever downloaded and used an e-wallet application before.

The use of the criterion questions was to filter whether respondents had ever used an e-wallet. The initial experience of using the e-wallet generated satisfaction, trust, and perceived usefulness for consumers. Respondents who indicated prior e-wallet use were directed to Section B, which explored their continued intention to use e-wallet. Those with negative responses were taken to the end of the questionnaire.

Section B focuses on the demographic profile, which discusses the characteristics of respondents: gender (Abbasi et al., 2022; Akter et al., 2013; Chandra et al., 2010); age (Akter et al., 2013; Chandra et al., 2010; Istiyana & Triana, 2019; Sfenrianto et al., 2017); city (Azizah et al., 2021); education (Chandra et al., 2010; Istiyana & Triana, 2019; Sfenrianto et al., 2017); occupation (Santosa et al., 2021; Slade et al., 2015); monthly income (Abbasi et al., 2022; Akter et al., 2013); and expenditure (Nelloh et al., 2019; Sfenrianto et al., 2017).

Section C delves into e-wallet usage specifics in Indonesia. Questions address initial e-wallet usage, preferred e-wallet types, reasons for usage, transaction types, underlying usage contexts, usage frequency, and volume. Selected products for this study included Gopay, OVO, Dana, LinkAja, Jenius, and Go-Mobile, representing the most frequently used options among Indonesians. These selections also encompassed fintech companies, MNOs, and banking institution.

Section D explores factors influencing respondents' intentions to continued intention and habit to use e-wallets. This section encompasses nine constructs, with four directly aligned with the original ECM: confirmation, perceived usefulness, satisfaction, and continued intention. Confirmation items were adopted from Bhattacharjee (2001b).

Each construct consists of several items, ranging from six to 10. In short, there are no specific numbers that apply universally (Hair et al., 2019a). Instead, the focus is on ensuring that the questionnaire is aligned with the research objectives, is clear and concise for respondents, and balances depth and breadth based on context. There are more questions about trust than others because they aim to deepen respondents'

understanding of trust and security. In online payments, consumers' confidence increases because they feel safe to use it (Barkhordari et al., 2017).

The initial question in this segment pertains to confirmation (Table 3.2). It affirms that e-wallet users have had prior experiences with these platforms. This research incorporated seven confirmation items, five adopted from Bhattacharjee (2001), and two adapted from Bhattacharjee and Premkumar (2004), and Shaw (2014).

Table 3.2
Items to Measure Confirmation

	Measurement Items	References
Co1	My understanding of the rules for using the e-wallet is in accordance with the instructions given by the e-wallet provider.	Adapted (Shaw, 2014)
Co2	My experience with using an e-wallet for making the payment was better than I had expected.	Adopted (Bhattacharjee, 2001b)
Co3	The service level provided by my e-wallet was better than what I expected	Adopted (Bhattacharjee, 2001b)
Co4	The expectations that I had about e-wallet services were correct	Adopted (Bhattacharjee, 2001b)
Co5	Expectations about e-wallet services are consistent.	Adapted (Bhattacharjee & Premkumar, 2004)
Co6	Overall, most of the expectations from using an e-wallet have been met.	Adopted (Bhattacharjee, 2001b)
Co7	Overall, most of my expectations from using an e-wallet were confirmed	Adopted (Bhattacharjee, 2001b)

The perceived usefulness items (Table 3.3) are adopted from two researchers. Five constructs were adopted from Chandra et al. (2010), and one adapted from Chandra et al. (2010). One construct was adopted from Shaw (2014), and the rest adapted from Kaur et al. (2020).

Table 3.3
Items to Measure Perceived Usefulness

	Measurement Items	References
Us1	Using an e-wallet would enable me to accomplish financial tasks quickly.	Adopted (Chandra et al., 2010)
Us2	Using an e-wallet would enable me to accomplish payments quickly.	Adopted (Chandra et al., 2010)
Us3	Using an e-wallet would enhance efficiency in making payments.	Adopted (Shaw, 2014)
Us4	Using an e-wallet would enhance my effectiveness in making payments	Adopted (Chandra et al., 2010)
Us5	Using an e-wallet would make it easier for me to manage payments	Adopted (Chandra et al., 2010)
Us6	Using an e-wallet would make it easier for me to make payments	Adopted (Chandra et al., 2010)
Us7	Using an e-wallet would ease me in monitoring expenses	Adapted (Kaur et al., 2020)
Us8	Overall, I find that e-wallets are useful for making payments	Adapted (Chandra et al., 2010)

Satisfaction items are from Bhattacharjee (2001a) on online brokerage system and websites research, Bhattacharjee (2001b) on the online banking system, and Susanto et al.'s (2016) on cell phone banking services. One construct adapted from Shaw (2014) (Table 3.4).

Table 3.4
Items to Measure Satisfaction

	Measurement Items	Adapted from
Sa1	I am pleased with the use of my e-wallet for making payments	Adopted (Bhattacharjee, 2001a)
Sa2	I think I did the right thing by deciding to use an e-wallet	Adopted (Susanto et al., 2016)

Table 3.4 continued

	Measurement Items	Adapted from
Sa3	My choice to use a cell phone for an e-wallet was a wise one	Adopted (Susanto et al., 2016)
Sa4	I feel frustrated during e-wallet transactions	Adopted (Bhattacharjee, 2001b)
Sa5	I feel terrible about <i>e-wallet</i>	Adopted (Bhattacharjee, 2001b)
Sa6	I feel very convenient using an e-wallet	Adopted (Bhattacharjee, 2001b)
Sa7	I will recommend my chosen e-wallet to others	Adapted (Shaw, 2014)

Continued intention items were adopted from Shaw (2014), who focused on the m-wallet, while the other two constructs were based on the researcher's observations (Table 3.5).

Table 3.5
Items to Measure Continued Intention

	Measurement Items	Resources
CI1	I expect my use of the e- wallet to increase in the future	Adopted (Shaw, 2014)
CI2	I intend to use the e-wallet in the future	Adopted (Shaw, 2014)
CI3	I will use all offered functions in the e-wallet	Self-derived
CI4	I will always try to use the e-wallet	Adopted (Shaw, 2014)
CI5	I plan to use the e-wallet frequently	Adopted (Shaw, 2014)
CI6	I will consistently use an e-wallet even though there is no promotional program.	Self-derived

Trust items were adopted from Chandra et al. (2010) and Kim et al. (2010). Chandra et al. (2010) investigated the antecedents and the consequences of consumer trust on e-payment acceptance (Chandra et al. 2010). Kim et al. (2010) researched e-payment systems within the scope of e-commerce. In e-commerce, consumers' perceived trust in e-payment is defines as consumer trust that e-payment transactions will be processed according to their expectations (Kim et al., 2010). Tr8, Tr9, and Tr10 were

adapted from Chandra et al. (2010), Kumar et al. (2018) and Deng et al. (2010), and one construct was self-derived (Table 3.6).

Table 3.6
Items to Measure Trust

	Measurement Items	Resources
Tr1	I trust e-wallet systems to be reliable	Adopted (Chandra et al., 2010)
Tr2	I trust e-wallet systems to be secure.	Adopted (Chandra et al., 2010)
Tr3	Even if the e-wallet is not monitored, I trust them to do the job correctly.	Adopted (Chandra et al., 2010)
Tr4	I trust the security mechanisms of e-wallet	Adopted (Kim et al., 2010)
Tr5	I trust e-wallet services	Adopted (Kim et al., 2010)
Tr6	I trust the information provided during the e-wallet process	Adopted (Kim et al., 2010)
Tr7	I believe in the good intentions of merchants/stores in providing e-wallet services.	Self-driven
Tr8	I trust e-wallet providers' reputation	Adapted (Chandra et al., 2010)
Tr9	I believe in the transparency of the e-wallet usage rules provided by the e-wallet provider.	Adapted (Kumar et al., 2018)
Tr10	Overall, I believe that e-wallet does not harm users	Adapted (Deng et al., 2010)

The perceived security item (Table 3.7), as an antecedent of trust was adopted from the research of Susanto et al. (2016) and Chandra et al. (2010). Susanto et al. (2016) investigated the continued intention towards mobile banking services. This study uses ECM, complementing it with the construct of trust and the assumption of perceived security as an antecedent of trust (Susanto et al., 2016), The perceived security item were taken from the research of Chandra et al. (2010), which functions

as part of structural assurance. Structural assurance indicates consumer confidence that the infrastructure is available to facilitate successful transactions (Table 3.7).

Table 3.7
Items to Measure Perceived Security

	Measurement Items	Resources
Sc1	I think this e-wallet service has mechanisms to ensure the safe transmission of its consumers' information	Adopted (Susanto, et al., 2016)
Sc2	I feel secure to perform transactions using e-wallet	Adopted (Susanto, et al., 2016)
Sc3	This e-wallet is a secure service through which to send sensitive information	Adopted (Susanto, et al., 2016)
Sc4	I feel assured that legal adequately protect me from problems with mobile technology	Adopted (Chandra et al., 2010)
Sc5	I feel assured that technological structures adequately protect me from problems with mobile technology	Adopted (Chandra et al., 2010)
Sc6	I feel confident that encryption and other technological safeguards on the mobile technology make it safe for me to make e-wallet payment	Adopted (Chandra et al., 2010)
Sc7	In general, the e-wallet provides robust and safe environment to perform payments.	Adopted (Chandra et al., 2010)

When Bhattacharjee (2001a) first introduced the ECM, one of his studies added an incentive construct. His research used the concept of Consumer Relationship Management (CRM) to maintain consumers using the online brokerage system. This research adapted from Bhattacharjee (2001a), one from Aydin (2016), and three others were self-derived (Table 3.8).

Table 3.8
Items to Measure Incentives

	Measurement Items	Adapted from
In1	My e-wallet offers incentives for its continued use, such as reward	Adapted (Bhattacharjee, 2001a)
In2	My e-wallet offers incentives for its continued use, such as cashback	Adapted (Bhattacharjee, 2001a)
In3	My e-wallet offers incentives for its continued use, such as bonus points	Adapted (Bhattacharjee, 2001a)
In4	I already understood the conditions for getting incentives	Self-derived
In5	E-wallet provides alternative payment innovations	Self-derived
In6	I get continuous protection for using my e-wallet	Self-derived
In7	I will not use an e-wallet that does not provide incentives	Adapted (Aydin, 2016)

Wide acceptance is one of the constructs in this study, which has never been used in previous studies. Wide acceptance is a condition in which consumers and merchants widely use e-wallets. Where there is a reciprocal relationship between consumers and merchants, merchants feel reluctant to provide alternative e-wallet payments if there is no guarantee of a sufficient number of e-wallet users to cover the e-wallet's operational costs. In contrast, according to consumers' views, they will pay using e-wallets if alternative e-wallet payments exist (Moghavvemi et al., 2021). This study adopted wide acceptance from Chawla and Joshi (2019) and adapted Kumar et al. (2018). However, most were self-derived (Table 3.9).

Table 3.9
Items to Measure Wide Acceptance

	Measurement Items	Adapted from
Wa1	Many friends and family know about e-wallet	Adapted (Kumar et al., 2018)
Wa2	I can easily find sellers that provide e-wallet payments	Self-derived
Wa3	Every store has a payment option with e-wallet	Self-derived

Table 3.9 continued

	Measurement Items	Adapted from
Wa4	Many opportunities exist to pay using e-wallet	Self-derived
Wa5	There are many e-wallet facilities that I have used.	Self-derived
Wa6	It is easy to top up the e-wallet	Self-derived
Wa7	Transferring funds via e-wallet is easy	Adopted (Chawla & Joshi, 2019)

Habit items (Table 3.10) were adopted from Limayem et al. (2003) and Limayem and Cheung (2008). Considering the dynamics of research results from 2001 until 2007, three constructs were self-derived.

Table 3.10
Items to Measure Habit

	Measurement Items	Adapted from
Ha1	I must use an e-wallet	Adopted (Limayem et al., 2003)
Ha2	I do not even think twice before using-wallet	Adopted (Limayem et al., 2003)
Ha3	Using an e-wallet has become natural to me	Adopted (Limayem et al., 2003)
Ha4	When I pay online, using an e-wallet is an obvious choice.	Adopted (Limayem & Cheung, 2008)
Ha5	My e-wallet always has enough funds to do transactions	Self-derived
Ha6	I feel weird doing cash transaction	Self-derived
Ha7	An e-wallet is a top priority for payment transactions	Self-derived

The questionnaire was initially crafted in English and later translated into Indonesian language for distribution, considering the research's location in Indonesia, where the official language is Indonesian. A direct translation approach was adopted given the closed-ended nature of the questionnaire. The translation was done by an English expert at UNIKOM.

3.3.2.3 Validity of Questionnaire

This study used validity testing to ensure the data is of high quality. The validity is a test of how well an instrument the intended concept. In other words, validity is concerns with whether or not the correct concept is being measured, namely reliability, stability, and consistency. There are three aspects of validity, namely, (i) measurement validity that is associated with the assessment including content validity, (ii) internal validity to analyse the authenticity of a causal relationship, and (iii) external validity to generalise variables to the external environment (Saunders et al., 2019). Moreover, content validity should be reviewed by experts from a similar field to ensure that the instrument has content validity. Three experts were invited to evaluate the items, following Yusoff (2019), who stated that the minimum requirement is two experts. All the three experts gave positive feedback. After content validity was achieved, the questionnaire was tested with a small community drawn the actual respondents.

3.3.2.4 Pilot Study

A pilot study, with a clear purpose, aims to assess the understanding of the questions, as well as the adequacy of their placement and instructions. Before the questionnaire was distributed, a pilot study was conducted to ascertain potential responses that might arise during the actual distribution of the questionnaire. The main purpose of this pilot study was to ensure construct validity regarding item dimensions and internal reliability before starting the main study.

The preparation of the questionnaire was meticulously undertaken, commencing with an extensive literature review of research. This comprehensive review served as the

bedrock for the research measurements, leading to a reduction in measurements from 83 to 66 questions. The reduction resulted from eliminating negative and ambiguous questions, hence ensuring that the prepared questions were clear and answerable by the respondents. To ensure the questions were universally answerable, the questionnaire was tested on a diverse group of respondents, including lecturers from UUM, UPNVJ and UNIKOM. This diverse group verified the content, ease of questions, and questionnaire presentation, ensuring the questionnaire's applicability across different demographics.

After meticulous preparation of the measurements, a trial was conducted to evaluate the final version of the questionnaire. This questionnaire was distributed to a small group of students as respondents, to ensure internal reliability and construct validity using SmartPLS. This rigorous validation process instilled confidence in the questionnaire's reliability.

The pilot study was conducted by targeting a specific group. A total of 30 respondents were determined; this is in accordance with the minimum requirements for data processing in SmartPLS. All respondents had had experience using e-wallet services, as confirmed in the questionnaire by asking them specific questions. The respondents were college students in UNIKOM.

Finally, the results of the questionnaire were validated through statistical analysis, including internal reliability consistency, construct validity, and discriminant validity tests, using SmartPLS. The results of the pilot study are presented in Table 3.11. All constructs met the criteria, with reference values set above 0.4 when exploring the items to be presented in the questionnaire. No value fell below 0.4, confirming all

items could be included in the research questionnaire. The lowest value is for the incentive construct, which is 0.407, but the measurement items on this construct were maintained because there was still a possibility that different respondents will interpret the question differently (Hardy & Ford, 2014). This is in contrast to the findings found at the time of the final results of the questionnaire; the researcher can delete items for these questions (Hair et al., 2017a).

Table 3.11
Convergent Validity for Pilot Study

Construct	Item Code	Outer Loading	Cronbach's alpha	CR	AVE
CI	CI1	0.875	0.897	0.900	0.656
	CI2	0.834			
	CI3	0.856			
	CI4	0.707			
	CI5	0.715			
	CI6	0.856			
Co	Co1	0.841	0.900	0.911	0.631
	Co2	0.746			
	Co3	0.612			
	Co4	0.756			
	Co5	0.815			
	Co6	0.914			
	Co7	0.843			
Ha	Ha1	0.573	0.853	0.870	0.535
	Ha2	0.787			
	Ha3	0.755			
	Ha4	0.806			
	Ha5	0.882			
	Ha6	0.542			
	Ha7	0.711			
In	In1	0.407	0.854	0.892	0.533
	In2	0.777			
	In3	0.710			
	In4	0.840			
	In5	0.796			
	In6	0.698			
	In7	0.796			
Sa	Sa1	0.865	0.863	0.891	0.558

Table 3.11 continued

Construct	Item Code	Outer Loading	Cronbach's alpha	CR	AVE
Sc	Sa2	0.824	0.888	0.907	0.607
	Sa3	0.720			
	Sa4	0.473			
	Sa5	0.537			
	Sa6	0.844			
	Sa7	0.856			
	Sc1	0.815			
	Sc2	0.803			
	Sc3	0.548			
	Sc4	0.696			
Tr	Sc5	0.801	0.930	0.941	0.617
	Sc6	0.846			
	Sc7	0.892			
	Tr1	0.874			
	Tr10	0.857			
	Tr2	0.814			
	Tr3	0.614			
	Tr4	0.835			
	Tr5	0.802			
	Tr6	0.843			
Us	Tr7	0.695	0.879	0.883	0.544
	Tr8	0.745			
	Tr9	0.737			
	Us1	0.645			
	Us2	0.714			
	Us3	0.762			
	Us4	0.792			
	Us5	0.759			
	Us6	0.776			
	Us7	0.773			
Wa	Us8	0.663	0.860	0.897	0.543
	Wa1	0.851			
	Wa2	0.787			
	Wa3	0.540			
	Wa4	0.696			
	Wa5	0.760			
	Wa6	0.617			
	Wa7	0.851			

Note:

CI = Continued Intention; Co = Confirmation; Ha = Habit; In = Incentives; Sa = Satisfaction; Sc = Perceived Security; Tr = Trust; Us = Perceived Usefulness; Wa = Wide Acceptance.

The pilot study ensured the questions were understandable and allowed respondents to provide answers. This study verified the questionnaire's functionality and ensured all instructions were understandable for respondents, as emphasised by Saunders et al. (2019). Consequently, the pilot study significantly enhanced the questionnaire's reliability. For discriminant validity, all outer loadings met the requirements to fulfill the Heterotrait-Monotrait (HTMT) ratio calculation. This can be seen in Table 3.12, where all values are below 0.85.

Table 3.12
Discriminant Validity: Heterotrait-Monotrait (HTMT) Ratio Statistics

	CI	Co	Ha	In	Sa	Sc	Tr	Us	Wa
CI									
Co	0.627								
Ha	0.659	0.674							
In	0.758	0.597	0.532						
Sa	0.676	0.818	0.755	0.541					
Sc	0.660	0.590	0.858	0.719	0.653				
Tr	0.695	0.763	0.830	0.637	0.712	0.893			
Us	0.553	0.770	0.801	0.569	0.897	0.769	0.822		
Wa	0.504	0.470	0.836	0.598	0.376	0.676	0.648	0.637	

Note:

CI = Continued Intention; Co = Confirmation; Ha = Habit; In = Incentives; Sa = Satisfaction; Sc = Perceived Security; Tr = Trust; Us = Perceived Usefulness; Wa = Wide Acceptance.

These two assessments led to the conclusion that the questionnaire is suitable for distribution to a larger community.

3.3.2.5 Data Analysis Technique

The PLS-SEM technique can estimate and predict the relationship between factors built in the model. PLS-SEM provides a powerful solution, especially when the goal is prediction. The PLS-SEM model is relatively complex, the small sample size and the phenomenon under study are new or changing (Hair et al., 2017e). PLS-SEM

evaluates recommended structural models based on the literature and does not evaluate whether or not the data fits the proposed model (Garson, 2016).

The first thing to do is test the normality of the data by checking for outliers. This check is carried out so that statistical calculations stay consistent (Thakkar, 2020). Outliers are a group of data that looks different from other data (Zainuddin, 2015). Outliers can occur due to observation errors, data entry errors (Kline, 2016; Saunders et al., 2019), and extreme responses to specific questions (Hair et al., 2017d). Outlier testing is carried out using skewness and kurtosis. Skewness assesses the symmetry of a variable's distribution. The response distribution stretches from right to left, characterised by skewness; the value ranges from -1 to +1 (Hair et al., 2017d). Kurtosis is a measure of vertical distribution where the distribution is narrow, and most respondents are in the middle area of the curve. Kurtosis shows the size of the extreme distribution, with a positive value indicating the peak and a negative value indicating the relative distribution of the data. Similar to skewness, the range of kurtosis values is from -1 to +1 (Hair et al., 2017d).

Secondly, describe the continued intention model using PLS path modelling (PLS-PM). This is followed by testing the measurement model and the structural model. The measurement model assessment aims to assess the model's construct validity by paying attention to the relationship between latent variables and manifest variables. Measurement validity is a procedure for analyzing convergent validity and discriminant validity. Convergent validity is the extent to which convergent constructs can explain item variance (Hair et al., 2018). Convergent validity calculations reflect high correlations between measures designed to measure the

same construct (Hair et al., 2020). Convergent validity in this study was assessed based on factor loadings, Cronbach's alpha, composite reliability, and average variance extracted (AVE).

High external loadings on a construct indicate good convergent validity, and the items converge. Hair et al. (2018) suggested that all factor loadings should be statistically significant. Cronbach's alpha is another measure of internal consistency reliability that assumes the same threshold, but produces lower values than composite reliability (Hair et al., 2018). Traditionally, Cronbach's alpha provides reliability estimates based on correlations between items, assuming that all indicators are reliable and tend to underestimate internal consistency reliability (Hair et al., 2018). Composite reliability is a measure of internal consistency reliability, which does not assume equal indicator loadings. Composite reliability aims to test consistency between measurement items by calculating the sum of the squares of the loading factors for each construct, divided by that number plus the number of error indicator items for a construct (Garson, 2016).

Furthermore, composite reliability must have a value above 0.70. In exploratory research, 0.60 to 0.70 is acceptable (Garson, 2016; Hair et al., 2018). Using estimated item loadings in models has made composite reliability a more general measure of reliability. Some researchers have considered composite reliability a more appropriate measure (Hair et al., 2020), with a criterion of 0.7 to 0.95 for standard reliability (Sarstedt et al., 2020).

Additionally, Hair et al. (2020) stated that a composite reliability value higher than 0.95 would be problematic because it indicates identical and redundant items. The

AVE calculation uses the method of squaring the loading of each indicator on a construct and calculating the average value. An acceptable AVE of 0.50 or higher indicates that the construct explains at least 50% of the item variance (Hair et al., 2020).

Discriminant validity includes the HTMT correlation ratio and the Fornell-Larcker criteria. Fornell and Larcker (1981) proposed that each construct's AVE should be compared with the squared inter-construct correlations (as a measure of shared variance) of the same construct, and that the expected variance for all model constructs should not be greater than their AVE values (Hair et al., 2017e). The Fornell-Larcker criteria require that the square root of each AVE value must be greater than its correlation with other constructs (Garson, 2016).

The HTMT ratio is the average value of item correlation between constructs relative to the mean correlation for items measuring the same construct. The problem that often occurs in discriminant validity is a high HTMT value. This usually happens because the assessments used are very similar. Henseler et al. (2015) suggested a value of 0.90 for the discriminant validity threshold if the path model includes conceptually similar constructs (Hair et al., 2017e). Discriminant validity is important to ensure that each construct is empirically unique and captures phenomena not represented by other statistical models (Hair et al., 2020).

The measurement model aims to determine the relationship between constructs and observed indicators (Henseler, 2017). This ensures that the resulting model is reliable and valid at this stage. So, there will be a possibility of excluding items in construction. Item deletion may occur due to the following:

1. Low factor loading. High factor loadings are necessary to achieve unidimensionality between measurement items. According to Garson (2016), the item must be excluded if the outer loading value is less than 0.4.
2. Due to redundancy between items, the results of calculating discriminant validity are redundant because the HTMT ratio needs to meet the criteria threshold, namely, less than 0.90.

Meanwhile, the structural model tests hypotheses by examining the relationships between latent variables. The outer model calculation was carried out using a bootstrapping procedure. Bootstrapping is a resampling technique that uses many subsamples of the original data and estimates a model for each subsample (Garson, 2016; Hair et al., 2017b). This research used bootstrapping calculations with 5000 subsamples. The function of bootstrapping is to determine the standard error of coefficient estimates to assess the statistical significance of coefficients without relying on distribution assumptions (Ghasemy et al., 2020). This test will show whether or not the relationship is significant. Apart from bootstrapping, structural model assessment also uses a blindfolding procedure. Blindfolding is a calculation that uses an omission distance value between five to 12 by default of seven, depending on the sample; namely, the number of samples divided by the exclusion distance cannot be a discrete value (Hair et al., 2017c).

Collinearity measurements use a bootstrapping procedure to calculate the variation inflation factor (VIF). VIF measures the severity of collinearity between indicators in the structural model. The threshold value for determining collinearity is that the

VIF value must be greater than 5.00 (Garson, 2016). Collinearity is considered not to occur if the VIF value is less than 5.00 (Hair et al., 2020).

The second assessment is the significance and relevance of the relationships in the structural model. The path coefficient describes the contribution or influence between construct variables, and the path coefficient is obtained through a bootstrapping procedure to determine the standard error. The results of the standard error calculation will produce a t-value – the t-value results from dividing the correlation value by the standard error. Determining whether or not a hypothesis is accepted is by using the beta value; if the beta value is positive, then the hypothesis is accepted; if the beta value is negative, then the hypothesis is most likely not accepted. The t-value as a determinant of the significance value has two types of testing, namely the non-directional (two-tailed) hypothesis, which has a critical t-value of 1.65 (10% significance level), 1.96 (5% significance level), and 2.58 (1% significance level) (Garson, 2016). The directional test (one-sided) has threshold values of 1.28 (10% significance level), 1.645 (5% significance level), and 2.33 (1% significance level) (Hair et al., 2017d).

The third assessment of the structural equation model is to determine the R-squared value, which will describe the predictive power of the endogenous variables of the structural model (Hair et al., 2017c). The rule of thumb is that the coefficient of determination of below 0.25, is considered to have a weak impact; between 0.26 to 0.74 is considered moderate, and if above 0.75, it has a large influence on exogenous latent variables in predicting endogenous latent variables (Hair et al., 2018). To evaluate the R-squared value, the effect size (f^2) calculation step is carried out to

assess the adequacy of the theory by looking at the contribution of each exogenous to the endogenous. The path coefficient must go through the measurement of the effect size to estimate the extent to which its presence is necessary, precisely whether or not the removal of each construct will have a significant influence on the endogenous variable. The f^2 measure is categorised into three levels: small, with values ranging from 0.02 to 0.15; medium, with a range of 0.15 to 0.35; and large, with values above 0.35 (Hair et al., 2020).

The final calculation is predictive relevance (Q^2) to measure predictive power through cross-validation redundancy (Hair et al., 2020) by reusing calculations to validate endogenous construct models. If the Q^2 value is more than zero for a particular endogenous latent variable, this establishes the predictive relevance of the path model for that particular construct. When interpreting the predictive relevance value, the value should be above zero, i.e., between 0.25 and 0.50, depicting moderate, and above 0.50, depicting large. If it is less than zero, it indicates a lack of predictive relevance (Hair et al., 2020). The Q^2 calculation is obtained from the blindfolding procedure. Hair et al. (2017c) recommends selecting a removal distance between five and 10, assuming the sample size divided by the removal distance is not an integer.

3.4 Chapter Summary

This chapter explains the research foundation, philosophy, and research process. The sequence of the research process begins with problem identification, sampling technique, clarifying the topic, and the research design. The chapter proceeds with the discussion of research design, including measurement development,

questionnaire design, pilot study, and data analysis technique. The next chapter explains the data analysis and results.



CHAPTER FOUR

DATA ANALYSIS AND RESULT

4.1 Introduction

This chapter discusses data analysis and the results. This entails descriptive analysis, including the demographic profile of the respondents, and an explanation of e-wallet usage and e-wallet products. This research undertook a 2-step approach. First, the measurement model assessment using construct validity, convergent validity, and discriminant validity; and second, the structural model assessment via PLS-SEM analysis and hypotheses testing, effect size, and predictive relevance.

4.2 Processing Data

Data processing in this research began after having the results of the questionnaire. Questionnaires were administered using the Google Forms facilities and distributed using the link provided by Google Forms. Further, WhatsApp was used to submit the link for respondents to fill out the questionnaire. The reason for using WhatsApp is to overcome limitations caused by the COVID-19 pandemic, and to increase the anonymity and privacy of respondents (Mavhandu-Mudzusi et al., 2022).

The questionnaire results were saved in Excel and checked for any missing values. To ensure that the data was from respondents who had used e-wallets, criteria questions were used to filter out those who had never used an e-wallet. Once this was confirmed, and it was ensured that the data did not contain any empty items, the data was ready for the statistical calculation process.

4.2.1 Collecting Data

The questionnaires were distributed from 5 November 2020 to 13 January 2021. Respondents filled out the questionnaire voluntarily and anonymously because respondents were not required to fill in their personal data while answering the questions. There were 518 respondents who responded to the questionnaire; of these, 472 questionnaires (91.13%) were deemed valid as they met the expected criteria of respondents, namely whether they had ever used an e-wallet. Valid questionnaires served as the basis for analysis. The remaining 46 questionnaires (8.88%) were considered irrelevant as the respondents had never used an e-wallet. The filtering of these questionnaires was done using a screening questions in the indicator statement section (Exclusion Criteria Questions), which is: Have you ever used an e-wallet? These questionnaires were tailored to fit the framework used, namely the ECM, which aims to indicate the factors that influence someone to continue his or her intention to use an e-wallet. The complete arrangement of the questionnaires is explained below.

The questionnaire contained indicator statements and filtering sections to distinguish respondents based on their experience with e-wallets. Specifically, if a respondent indicated no prior use of e-wallets, the validation process would cease, concluding the questionnaire and recording the responses. Conversely, for respondents who acknowledged previous use of e-wallets, they proceeded to subsequent questions. This question is a necessity because this study used the ECM. The ECM is a model that describes the continued intention to use the e-wallet.

4.2.2 Screening Data

After getting back the questionnaires, the first step was to enter the data through SPSS by changing all data types to numerical and giving codes in the form of numbers for several items. Sekaran and Bougie (2016) stated that the collected data needs to be coded and transcribed from the questionnaire into a dataset. This study conducted data processing using SmartPLS. Data processing included 472 valid data, with no data records with empty values. Before processing the data, researchers must ensure that the data distribution is normal, although PLS-SEM can process nonnormal data (Hair et al., 2019b). For this reason, normality testing was needed to ensure that the data distribution is normal and that there are no outliers. Outliers are nonnormal data distributions with values that significantly differ from similar data. Data testing in SmartPLS uses the skewness and excess kurtosis methods.

4.2.2.1 Normality Assessment

Normality checks ensure that the data to be analyzed is normal because non-normal data will increase the standard error. Normality checks will reduce the probability that some relationships are not significant; the assessment procedure used was bootstrapping (Hair et al., 2016; Zainuddin, 2015). This study used skewness and kurtosis to measure the normality of the observed variable. These two methods are the most commonly used to assess univariate and multivariate normality (Hair et al., 2017d).

As shown in Table 4.1, several constructs have skewness and kurtosis values outside the specified range, such as for perceived usefulness (Us2), overall skewness value on perceived usefulness is -1.098 to -0.416, with an absolute kurtosis value between

-0.548 to 1.276. The confirmation construct has a skewness value between the absolute value of -0.700 to -0.335; the kurtosis value is between 0.127 to 1.389, where kurtosis values outside the threshold are (Co2) and (Co7). The construct that did not meet skewness value but fulfilled the kurtosis value is satisfaction (Sa5). Its value is -0.538 to 1.182, with a kurtosis value between -0.948 to 0.715.

Six other constructs have kurtosis and skewness values within the range that meets the normal distribution. The constructs are continued intention, trust, perceived security, incentives, wide acceptance, and habit. For skewness, sequentially, it is: -0.574 to -0.034, -0.440 to 0.010, -0.391 to -0.073, -0.597 to 0.022, and -0.831 to -0.271, with all numbers in absolute value. Furthermore, for kurtosis, sequentially, it is: -0.435 to 0.054, -0.660 to 0.312, -0.512 to 0.309, -0.633 to 0.390 and -0.677 to 0.822, in absolute value.

Table 4.1
Descriptive Statistics and Normality Criteria

Construct	Item code	Descriptive Statistics			Normality Criteria	
		Min	Max	Standard Deviation	Excess Kurtosis	Skewness
Confirmation	Co1	1.000	5.000	0.747	0.127	-0.510
	Co2	1.000	5.000	0.717	1.001	-0.682
	Co3	1.000	5.000	0.732	0.130	-0.335
	Co4	1.000	5.000	0.716	0.689	-0.474
	Co5	1.000	5.000	0.715	0.952	-0.569
	Co6	1.000	5.000	0.698	0.382	-0.392
	Co7	1.000	5.000	0.742	1.389	-0.700
Perceived Usefulness	Us1	1.000	5.000	0.809	0.175	-0.710
	Us2	1.000	5.000	0.728	1.276	-1.098
	Us3	1.000	5.000	0.747	0.904	-0.980
	Us4	2.000	5.000	0.716	0.372	-0.828
	Us5	1.000	5.000	0.807	-0.114	-0.607
	Us6	2.000	5.000	0.714	-0.137	-0.685
	Us7	1.000	5.000	0.996	-0.548	-0.416
	Us8	2.000	5.000	0.694	0.563	-0.789
Satisfaction	Sa1	2.000	5.000	0.794	-0.756	-0.277

Table 4.1 continued

Construct	Item code	Descriptive Statistics			Normality Criteria	
		Min	Max	Standard Deviation	Excess Kurtosis	Skewness
Continued Intention	Sa2	1.000	5.000		0.068	-0.495
	Sa3	2.000	5.000	0.802	-0.948	-0.017
	Sa4	1.000	5.000	1.135	0.133	0.939
	Sa5	1.000	5.000	1.129	0.715	1.182
	Sa6	1.000	5.000	0.781	0.410	-0.538
	Sa7	1.000	5.000	0.866	-0.578	-0.144
	CI1	1.000	5.000	0.859	-0.181	-0.432
	CI2	1.000	5.000	0.806	0.054	-0.574
	CI3	1.000	5.000	0.912	-0.435	-0.034
	CI4	1.000	5.000	0.849	-0.209	-0.306
Trust	CI5	1.000	5.000	0.921	-0.228	-0.153
	CI6	1.000	5.000	0.930	0.140	-0.415
	Tr1	1.000	5.000	0.764	0.646	-0.440
	Tr2	1.000	5.000	0.799	-0.006	-0.240
	Tr3	1.000	5.000	1.017	-0.219	-0.260
	Tr4	1.000	5.000	0.780	-0.389	0.010
	Tr5	2.000	5.000	0.761	-0.379	-0.206
	Tr6	1.000	5.000	0.769	0.312	-0.353
	Tr7	1.000	5.000	0.746	0.062	-0.285
	Tr8	2.000	5.000	0.743	-0.660	-0.129
Perceived Security	Tr9	1.000	5.000	0.762	-0.009	-0.266
	Tr10	1.000	5.000	0.801	0.006	-0.287
	Sc1	1.000	5.000	0.764	-0.349	-0.186
	Sc2	1.000	5.000	0.745	-0.182	-0.242
	Sc3	1.000	5.000	0.964	-0.108	-0.202
	Sc4	1.000	5.000	0.876	-0.059	-0.285
	Sc5	1.000	5.000	0.811	0.014	-0.150
	Sc6	1.000	5.000	0.800	0.309	-0.391
	Sc7	2.000	5.000	0.735	-0.512	-0.073
Incentives	In1	2.000	5.000	0.803	-0.633	-0.433
	In2	1.000	5.000	0.859	0.390	-0.597
	In3	1.000	5.000	0.829	0.160	-0.460
	In4	2.000	5.000	0.811	-0.611	-0.125
	In5	1.000	5.000	0.767	-0.274	-0.331
	In6	1.000	5.000	0.807	-0.444	0.022
	In7	1.000	5.000	1.068	-0.413	-0.096
Wide Acceptance	Wa1	1.000	5.000	0.787	0.822	-0.831
	Wa2	1.000	5.000	0.853	0.033	-0.510
	Wa3	1.000	5.000	1.047	-0.555	-0.304
	Wa4	1.000	5.000	0.777	0.668	-0.586
	Wa5	2.000	5.000	0.728	-0.677	-0.271
	Wa6	1.000	5.000	0.803	0.376	-0.647
	Wa7	1.000	5.000	0.872	0.050	-0.571

Table 4.1 continued

Construct	Item code	Descriptive Statistics			Normality Criteria	
		Min	Max	Standard Deviation	Excess Kurtosis	Skewness
Habit	Ha1	1.000	5.000	0.917	-0.117	-0.385
	Ha2	1.000	5.000	0.965	-0.188	-0.340
	Ha3	1.000	5.000	0.896	0.507	-0.696
	Ha4	1.000	5.000	0.962	-0.034	-0.395
	Ha5	1.000	5.000	1.023	-0.287	-0.225
	Ha6	1.000	5.000	1.187	-0.605	0.371
	Ha7	1.000	5.000	1.062	-0.391	-0.147

According to Hair et al. (2017d), a slope value greater than 1 or less than -1, is considered positively or negatively skewed so that it is not symmetrical in the distribution; while values in the range -1 to 1 are normal values. Based on Table 4.1, two indicators have values outside the range of -1 and 1, namely Us2 and Sa5; the values are slightly non-normal, with the value of Us2 being -1.098 and Sa5 being 1.182. This deviation is considered not a problem, and the indicator can still be maintained (Hair et al., 2017d). The constructs with kurtosis values outside the -1 and +1 range are Co2, Co7 and Us2, and it considered acceptable (George & Mallery, 2016; Pallant, 2016).

4.3 Descriptive Analysis

The descriptive analysis presents information for statistical calculation in the next stage. Specifically, it describes a set of variables in a situation that will make it easy to understand and interpret. This analysis aims to provide meaning from the data through the distribution of frequency and variance, enabling the researcher to identify differences between variables (Sekaran & Bougie, 2016).

This stage consists of several parts: First, it provides complete details of the respondents' descriptive analysis and demographic profile. The second section

provides complete details regarding the descriptive analysis of e-wallet usage. Last, it explains the types of e-wallets that are widely used in Indonesia.

4.3.1 Respondents' Profile

This section presents demographic information for all respondents. A total of 518 individuals completed the questionnaire, and 472 of these responses were deemed valid for data analysis. According to the Krejcie and Morgan Table, a sample size of 384 is sufficient for simple random sampling research in a population exceeding one million (Memon et al., 2020). Therefore, the 472 valid samples were suitable for PLS-SEM analysis.

In terms of gender, as indicated in Table 4.2, there is no fundamental difference between the number of male and female respondents, namely 50.85% and 49.15%. In this study, there are five age groups: one respondent is below 15 years old (0.21%), 136 respondents are within the 15-20 years old group (28.81%), 150 respondents are within the 21-30 years old group (31.78%), 96 respondents are within the 31-40 years old group (20.34%), 70 respondents are within the 41-50 years old group (14.83%), and 19 respondents are within the age group above 50 years old (4.03%).

In terms of the level of education, the respondents fall within three categories: 37 have high school certificates (7.84%), 326 with first degrees (69.07%), and 109 with post-graduate degrees (23.09%).

Based on occupation, the respondents fall within four categories: 228 respondents (48.31%) are students, 176 respondents (37.29%) are workers, 40 respondents

(8.47%) are entrepreneurs, and 28 respondents (5.83%) have another job not specified in the questionnaire.

Regarding monthly income, 108 respondents fall within the monthly income group above IDR 7.500.000 (22.88%), 68 within the group of IDR 5.000.001 to IDR 7.500.000 (14.41%), 122 in the group between IDR 1.500.001 to IDR 5.000.000 (25.85%), and 174 respondents below IDR 1.500.000 (36.86%). Lastly, 76 respondents fall within the group above IDR 7.500.000 for monthly expenses (16.10%), 49 within IDR 5.000.001 to IDR 7.500.000 (10.38%), 148 between IDR 1.500.001 – IDR 5.000.000 (31.36%), and 199 respondents at less than IDR 1.500.000 (42.16%).

Table 4.2
Demographic Profile of Respondents

Demographics	Count	Percentage
Gender		
Male	240	50.85%
Female	232	49.15%
Age		
< 15 years	1	0.21%
15 – 20 years	136	28.81%
21 – 30 years	150	31.78%
31 – 40 years	96	20.34%
41 – 50 years	70	14.83%
> 50 years	19	4.03%
City		
Jakarta	132	27.97%
Bandung	216	45.76%
Semarang	6	1.27%
Yogyakarta	6	1.27%
Surabaya	11	2.33%
Others	101	21.40%
Level of education		
High School	37	7.84%
Degree	326	69.07%
Post-graduate	109	23.09%

Table 4.2 continued

Demographics	Count	Percentage
Occupation		
Student	228	48.31%
Worker	176	37.29%
Entrepreneur	40	8.47%
Others	28	5.93%
Monthly income		
> IDR 7.500.000	108	22.88%
IDR 5.000.001 to IDR 7.500.000	68	14.41%
IDR 1.500.001 to IDR 5.000.000	122	25.85%
< IDR 1.500.000	174	36.86%
Monthly expenses		
> IDR 7.500.000	76	16.10%
IDR 5.000.001 to IDR 7.500.000	49	10.38%
IDR 1.500.000 to IDR 5.000.000	148	31.36%
< IDR 1.500.000	199	42.16%

The distribution of questionnaires was on Java Island among the five prominent cities. The island of Java was selected because the majority of Indonesia's population lives in Java, and 55.7% of internet consumers are on this island (Asosiasi Penyelenggara Jasa Internet Indonesia, 2018), with 78% of e-wallet consumers there (Jakpat, 2020). Four of the six cities have more than one million people, namely Jakarta, Bandung, Semarang, and Surabaya (Ipsos, 2020). As shown in Table 4.3, 132 respondents are from Jakarta (27.97%), 216 respondents are from Bandung (45.76%), six respondents are from Semarang (1.27%), six respondents are from Yogyakarta (1.27%), 11 respondents are from Surabaya (2.33%), and 96 respondents are from other cities in Indonesia (20.34%).

Table 4.3
E-wallet Consumers on Java Island

Province	Count	Percentage
DKI Jakarta	132	27.97%
West Java	265	56.14%
Banten	20	4.24%

Table 4.3 continued

Central Java	12	2.54%
DI Yogyakarta	6	1.27%
East Java	14	2.97%
Others	23	4.87%

The distribution of this income group is based on the BPS report, which states that income below 1.5 million rupiahs is earned in the age group between 15-19 years or the primary education group, while income above 7.5 million is in the 35 to 50 years group for managerial workers (Badan Pusat Statistik Indonesia, 2020).

4.3.2 E-wallet Profile

In section D of the questionnaire, there are questions about e-wallet consumer experiences and the e-wallet products they use. This section confirms the initial interest in e-wallets and examines consumers' use of e-wallets. This section begins with a question about whether the consumer has a bank account. This question aims to determine how many consumers have bank accounts. E-wallet providers can be banking institutions, fintech companies, or MNOs. According to the survey results, the majority of respondents had a bank account (97.67%), and 11 respondents do not have a bank account (2.33%).

4.3.2.1 E-wallet Usage

In terms of e-wallet consumers' experience, it is as indicated in Table 4.4. The initial use categories of consumers who first used e-wallets are divided into four groups: 66 respondents (13.98%) started using e-wallets about three months ago, 21 respondents (4.45%) between 3 – 6 months ago, 51 respondents (10.81%) between 6 – 12 months ago, and 334 respondents (70.76%) had used it more than one year ago.

Table 4.4
An Overview of E-wallet Usage in Indonesia

Variable	Frequency	Percentage
Initial Usage		
Around 3 months ago	66	13.98%
Between 3 - 6 months ago	21	4.45%
Between 6 - 12 months ago	51	10.81%
More than 1 year	334	70.76%
Reasoning		
Variative places	223	24.03%
Easy to top up	230	24.78%
Promotion program	332	35.78%
Better security	107	11.53%
Others	36	3.88%
Allotment		
Transportation	280	19.13%
Food Order	353	24.11%
Dine-in	185	12.64%
Shopping	110	7.51%
Bill payment	131	8.95%
Online shop	235	16.05%
Fund transfer	155	10.59%
Others	15	1.02%
Situation		
Every time	106	22.46%
Most of the time	149	31.57%
Sometimes when run out of cash	176	37.29%
Others	41	8.69%
Frequent		
1 – 3 times	325	68.86%
4 – 6 times	92	19.49%
More than six times	55	11.65%
Nominal transactions by e-wallet (monthly)		
> IDR 7.500.000	9	1.91%
IDR 5.000.000 to IDR 7.500.000	10	2.12%
IDR 1.500.001 to IDR 5.000.000	87	18.43%
< IDR 1.500.000	366	77.54%

The reasons consumers use e-wallets are divided into several conditions, which are 223 respondents (24.03%) because many stores accept e-wallets as a payment method (variation of places), 230 respondents (24.78%) because it is easy to top-up, 332 respondents (35.78%) because of promotional programs offered by e-wallet

providers, 107 respondents (11.53%) because e-wallet has a better security mechanism, and 36 respondents (3.88%) have reasons other than those mentioned earlier.

For the e-wallet functions perceived by consumers, 280 respondents (19.13%) are using it for transportation payments in the form of e-hailing, 353 respondents (24.11%) for purchasing food through applications, 185 respondents (12.64%) use it at dine-in restaurants, 235 respondents (16.05%) use it to purchase goods via the internet or online shopping, 110 respondents (7.51%) make purchases at the on-site store, 131 respondents (8.95%) use it to pay monthly bills, 155 respondents (10.59%) make money transfers, and 15 respondents (1.02%) use it for other things that are not in the options.

The condition of consumers using e-wallets is that 106 respondents (22.46%) use e-wallets every time they want to make a transaction, and e-wallet payment methods are available. Second, 149 respondents (31.57%) often use e-wallets when they find a shop with e-wallet payment tools. Third, 176 respondents (37.29%) use it only when they do not have enough money in their wallet, and the last, 41 respondents (8.69%) use it for other reasons, such as e-wallet payment promotions.

From the frequency of e-wallet use in a week, the results obtained are 325 respondents (68.86%) use e-wallets 1-3 times a week, 92 respondents (19.49%) use it 4-6 times, and 55 respondents (11.65%) make e-wallet transactions more than six times a week. The nominal purchase amount via e-wallet is categorised into four groups: above IDR 7,500,000, nine respondents (1.91%), between IDR 5,000,001 to IDR 7,500,000, 10 respondents (2.12%), between IDR 1,500,001 to IDR 5,000,000

as many as 87 respondents (18.4%) and less than IDR 1,500,000 as many as 366 respondents (77.54%).

4.3.2.2 E-wallet Products

In terms of e-wallet products, the question aimed to find out what type of e-wallet is most widely used in Indonesia. In general, a common situation in Indonesia is that someone owns and uses more than one e-wallet.

First, respondents were asked what e-wallet they use for transactions: the answer: 374 respondents (30.99%) use Gopay, 366 respondents (30.32%) use OVO, 242 respondents (20.05%) use Dana, 121 respondents (10.02%) use LinkAja, 68 respondents (5.63%) are Jenius users, 14 respondents (1.16%) are Go-Mobile users, and 22 respondents (1.82%) use other e-wallets, i.e., e-Money (5 respondents), Flip (5 respondents), Doku (4 respondents), Apple pay (2 respondents), Paypal (1 respondent), Wallet (1 respondent), Revolut (1 respondent), Fasapay (1 respondent), Payco (1 respondent), and four respondents use debit cards (as shown in Table 4.5).

Second, the question is what e-wallet is currently most widely used for transactions; 181 respondents (38.35%) use Gopay, 174 respondents (36.86%) use OVO, 55 respondents (11.65%) use Dana, 21 respondents (4.45%) use LinkAja, 15 respondents (3.18%) use Jenius, two respondents (0.42%) use Go-Mobile, and 24 respondents (1.82%) use other e-wallets, i.e., ShoppePay (14 respondents), Apple pay (2 respondents), Bank pay (1 respondent), e-Money (1 respondent), Fasapay (1 respondent), Flip (1 respondent), and four respondents use debit card (as shown in Table 4.5).

Table 4.5
E-wallet Product in Indonesia

Product	Count	Percentage
Ever use		
Gopay	374	30.99%
OVO	366	30.32%
Dana	242	20.05%
LinkAja	121	10.02%
Jenius	68	5.63%
Go-Mobile	14	1.16%
Others	22	1.82%
Mostly used		
Gopay	181	38.35%
OVO	174	36.86%
Dana	55	11.65%
LinkAja	21	4.45%
Jenius	15	3.18%
Go-Mobile	2	0.42%
Others	24	5.08%

4.4 Measurement Model Assessment

The measurement model is part of the model that represents the relationship between the latent variable and its size. The measurement model assessment aims to ensure the validity and reliability of all constructs. Construct validity ensures that a set of measures (manifest variables) represents the theoretical latent variables (Hair et al., 2018). Measurement validity is a procedure to analyze convergent validity and discriminant validity. In particular, convergent validity examines the relationship between factors in the measurement model, such as Average Variance Extracted (AVE) and reliability.

Discriminant validity includes the Heterotrait-Monotrait (HTMT) correlation ratio and the Fornell-Larcker criteria. The AVE value evaluates the strength of the correlation on the construct in its measure compared to other constructs. It must be

greater than 0.5 for sufficient convergent validity (Hair et al., 2020). Fornell and Larcker (1981) suggested that this measure can also be interpreted as a measure of reliability for the score of the e-wallet component and tends to be more conservative than composite reliability. If it is above 0.50, the construct explains more than half the variance of the indicator.

The measurement model aims to determine the relationship between the construct and the observed indicator (Henseler, 2017). It ensures that the inner model is reliable and valid at this stage. So, there will be the possibility of deleting items in a construct. Item deletion may occur due to the small value of the outer loading and redundancy between items.

4.4.1 Construct Validity

Construct validity ensures that measures (manifest variables) represent theoretical latent variables (Hair et al., 2018). This is based on calculating convergent and discriminant validity assessments. Both of these tests use PLS-PM, which describes the development of the questionnaire from the model of consumers' continued intention with 10 constructs. The constructs are confirmation with seven items; perceived usefulness with eight items; satisfaction with seven items; continued intention with six items; trust with 10 items, perceived security with seven items; incentive with seven items; wide acceptance with seven items; and habit with seven items. The model studied is depicted in Figure B.1 in Appendix B.

The outer loading value is obtained from the number given by the observed indicator or variable, and is valid for measuring the independent variable. This study used values above 0.40 to explore appropriate indicators for the constructs used at this

stage. According to Garson (2016), there are three categories of values that receive different treatment. If the external loading is above 0.70, then the item will be used in the next calculation; if it is between 0.40 and 0.70, it can be retained, and if the value is below 0.40, then the item must be excluded because it will affect the reliability of the variable.

From initial PLS-PM in Figure B.1 in Appendix B, the outer loading values for confirmation, perceived usefulness, intention to continue, habit, trust, perceived security, and widespread acceptance are above 0.40. As for satisfaction, items Sa4 and Sa5 are below 0.40. Another variable that does not meet the requirements is incentives, namely In7. According to Hair et al. (2014), if the external loading value does not meet the requirements, then items that do not meet these requirements should be deleted. After deleting these items, the next procedure was to recalculate the external loadings in the PLS algorithm, and then check the results until a reliable model is obtained.

After a model meets the reliability requirements, the next step is to validate the model. The validity test involves the calculation of the HTMT ratio. The modified PLS-PM finds that neither the HTMT value nor the Fornell-Lacker criteria meet the valid criteria. Once again, to meet the requirements, the PLS algorithm conducted the re-calculation process. The calculation results suggest reducing items in the trust construct due to the lack of uniqueness between the items in the trust construct and perceived security, incentives, and wide acceptance. The study eliminated the items sequentially: Tr3, Tr1, Tr2, and Tr10. The deletion of items procedure then met the

discriminant validity criteria using the HTMT ratio. The calculation results produced a PLS-PM as in Figure B.2 in Appendix B.

In the process of modifying the PLS-PM, four repetitions of the PLS algorithm calculation must meet the criteria of a reliable and valid inner model. The calculation removed one item in each iteration, and so, this process removed seven items, namely Sa4, Sa5, In7, Tr1, Tr2, Tr3 and Tr10. According to Hair et al. (2017a), item deletion is possible because the number of items removed is less than 20%.

4.4.2 Convergent Validity

Convergent validity is the extent to which the convergent construct can explain the variance of the items (Hair et al., 2018). The calculation of convergent validity reflects a high correlation between measures designed to measure the same construct (Hair et al., 2020). Convergent validity was assessed based on factor loading, Cronbach's alpha, AVE, and composite reliability.

Based on Table 4.6, the outer loading value meets good convergent validity values, and the items converge simultaneously. The outer loading values for all constructs are in the range of 0.548 – 0.898, according to the suggestions of Hair et al. (2018), that all outer loadings must be statistically significant. The outer loading value for Confirmation is in the range 0.680 – 0.870, Satisfaction is in the range 0.763 – 0.837, Trust is in the range 0.844 – 0.885, Perceived Usefulness is in the range 0.563– 0.884, Perceived Security is in the range 0.686 – 0.763, Incentives is in the range 0.723 – 0.835, Wide Acceptance is between 0.554 – 0.828, Continued Intention is in the range of 0.662 – 0.857, and Habit has a value between 0.581 – 0.886. All values have met the requirements for calculating reliability and validity.

The AVE calculation using the method of squaring the loading of each indicator on a construct and calculating the average value is acceptable because all constructs have values above 0.50, namely from 0.545 - 0.750. This indicates that the construct explains at least 50% of the item's variance (Hair et al., 2020).

The composite reliability value meets the required range of 0.700 and 0.950, from 0.892 to 0.947. According to Sarstedt et al. (2020), a composite reliability value higher than 0.95 would be problematic, as this indicates identical and redundant construct items. In this study, the value is between 0.858 to 0.925. The same applies to Cronbach's Alpha values: all constructs' Alpha values are between the AVE value and composite reliability (Hair et al., 2018).

Table 4.6
Convergent Validity

Construct	Item Code	Outer Loading	Cronbach's alpha	CR	AVE
Continued Intention (CI)	CI1	0.801	0.884	0.912	0.635
	CI2	0.796			
	CI3	0.801			
	CI4	0.849			
	CI5	0.857			
	CI6	0.662			
Confirmation (Co)	Co1	0.680	0.909	0.928	0.649
	Co2	0.796			
	Co3	0.796			
	Co4	0.854			
	Co5	0.870			
	Co6	0.832			
	Co7	0.798			
Habit (Ha)	Ha1	0.796	0.898	0.919	0.623
	Ha2	0.881			
	Ha3	0.806			
	Ha4	0.886			
	Ha5	0.749			
	Ha6	0.581			
	Ha7	0.785			
	In1	0.723	0.867	0.899	0.599

Table 4.6 continued

Construct	Item Code	Outer Loading	Cronbach's alpha	CR	AVE
Incentive (In)	In2	0.758	0.867	0.904	0.653
	In3	0.789			
	In4	0.835			
	In5	0.790			
	In6	0.744			
Satisfaction (Sa)	Sa1	0.837	0.920	0.936	0.676
	Sa2	0.833			
	Sa3	0.801			
	Sa6	0.803			
	Sa7	0.763			
Perceived Security (Sc)	Sc1	0.853	0.933	0.947	0.750
	Sc2	0.830			
	Sc3	0.686			
	Sc4	0.800			
	Sc5	0.850			
	Sc6	0.859			
	Sc7	0.861			
Trust (Tr)	Tr4	0.844	0.913	0.930	0.629
	Tr5	0.874			
	Tr6	0.885			
	Tr7	0.856			
	Tr8	0.877			
	Tr9	0.860			
Perceived Usefulness (Us)	Us1	0.739	0.858	0.892	0.545
	Us2	0.808			
	Us3	0.829			
	Us4	0.870			
	Us5	0.797			
	Us6	0.884			
	Us7	0.563			
	Us8	0.808			
Wide Acceptance (Wa)	Wa1	0.692	0.858	0.892	0.545
	Wa2	0.769			
	Wa3	0.554			
	Wa4	0.787			
	Wa5	0.828			
	Wa6	0.763			
	Wa7	0.744			

Note:

CI = Continued Intention; Co = Confirmation; Ha = Habit; In = Incentives; Sa = Satisfaction; Sc = Perceived Security; Tr = Trust; Us = Perceived Usefulness; Wa = Wide Acceptance

4.4.3 Discriminant Validity

This study used reflective measurement because the indicators used in each construct are interchangeable. The next order in the reflective method was to assess

discriminant validity. Discriminant validity indicates that a construct is empirically unique from other constructs in SEM (Hair et al., 2020).

Fornell and Larcker (1981) proposed that each AVE construct should compare with the correlation between quadratic constructs (as a measure of shared variance) of the same construct and that the expected variance for all model constructs should not be greater than their AVE values (Hair et al., 2017e). The Fornell-Larcker criteria demand that the square root of each AVE value must be greater than its correlation with other constructs (Garson, 2016).

Table 4.7
Discriminant Validity: Fornell-Larcker Criteria

	Co	CI	Ha	In	Sc	Us	Sa	Tr	Wa
Co	0.806								
CI	0.579	0.797							
Ha	0.554	0.730	0.789						
In	0.583	0.585	0.587	0.774					
Sc	0.626	0.696	0.693	0.714	0.822				
Us	0.741	0.589	0.526	0.553	0.576	0.793			
Sa	0.731	0.743	0.718	0.633	0.702	0.749	0.808		
Tr	0.694	0.630	0.602	0.715	0.815	0.636	0.732	0.877	
Wa	0.605	0.588	0.678	0.670	0.661	0.581	0.658	0.710	0.738

Note:

CI = Continued Intention; Co = Confirmation; Ha = Habit; In = Incentives; Sa = Satisfaction; Sc = Perceived Security; Tr = Trust; Us = Perceived Usefulness; Wa = Wide Acceptance

Henseler et al. (2015) proposed using HTMT ratio calculation. Henseler et al. (2015) assumed that Fornell-Larcker's criteria do not perform well, especially when the loading indicators only have slightly different values (Henseler et al., 2015). After obtaining the modified PLS-PM, the first PLS algorithm found that the HTMT value for perceived security and trust is too high, i.e., 0.925. Based on the threshold used, the HTMT value must be below 0.90. In order to get this value, it was necessary to

perform a re-calculation procedure. The sequence of steps reduced the lowest trust construct value and recalculated the HTMT ratio. The calculation stopped when the HTMT values were less than 0.90. On the other hand, the calculation was repeated if it did not meet the requirements. In the last calculation, the HTMT value is 0.844 for perceived security and trust, and this PLS-PM was used for structural model assessment.

Table 4.8

Discriminant Validity: Heterotrait-Monotrait (HTMT) Ratio Statistics

	Co	CI	Ha	In	Sc	Us	Sa	Tr	Wa
Co									
CI	0.645								
Ha	0.585	0.793							
In	0.642	0.642	0.630						
Sc	0.675	0.769	0.749	0.766					
Us	0.811	0.654	0.563	0.613	0.620				
Sa	0.823	0.838	0.789	0.711	0.775	0.844			
Tr	0.757	0.694	0.638	0.782	0.867	0.694	0.819		
Wa	0.682	0.671	0.748	0.754	0.726	0.651	0.754	0.788	

Note: $HTMT \leq 0.90$

CI = Continued Intention; Co = Confirmation; Ha = Habit; In = Incentives; Sa = Satisfaction; Sc = Perceived Security; Tr = Trust; Us = Perceived Usefulness; Wa = Wide Acceptance

In sum, after finishing the measurement model assessment, the researcher could continue to structural model assessment by calculating reliability and validity. Some modifying constructs meet the HTMT value criteria: satisfaction, trust, and incentives.

4.5 Structural Model Assessment

After the inner model was declared reliable and valid, the researcher assessed the structural model (Hair et al., 2017d). This stage evaluates the structural model results, which involved examining the predictive ability of the model and the relationship between the constructs (Garson, 2016).

This study did not apply the goodness of fit measure because of the structural model in PLS-SEM. PLS-SEM is assessed based on heuristic criteria determined by the model's predictive ability. The model is assumed correct and assessed for predicting endogenous variables/constructs (Rigdon et al., 2017). The calculation procedure at this stage is the significance of the path coefficient, the level of the R-Squared value, the effect size (f^2), and predictive relevance (Q^2). Before performing the calculations for the four items, collinearity checks were completed to ensure there was no bias between predictor constructs.

Calculation of the outer model is by using the bootstrapping procedure. Bootstrapping is a resampling technique that uses a large number of subsamples of the original data and estimates the model for each subsample (Garson, 2016; Hair et al., 2014). The number of resampling used is the minimum number of samples used in the study. This study used 5000 subsamples (the number of bootstrap samples must be larger than the number of valid observations in the original data set). The function of bootstrapping is to determine the standard error of coefficient estimates to assess the statistical significance of the coefficients without relying on distribution assumptions (Ghasemy et al., 2020). Bootstrapping calculations will produce standard error, confidence intervals, and t-values. This test will indicate whether or not the relationship is significant. The results of the bootstrapping calculation can be seen in Figure B.3 in Appendix B.

In addition to bootstrapping, the structural model assessment also used a PLS Predict procedure. PLS Predict is a calculation that uses the omission distance value between

5-12 by default seven, depending on samples, i.e., the number of samples divided by the omission distance cannot be a discrete value (Hair et al., 2017b).

4.5.1 Collinearity Assessment

This study evaluated the structural model; the first step was to examine collinearity. When estimating the endogenous path coefficient on the predecessor construct, there may be bias if the estimate involves a high degree of collinearity among predictor constructs. Collinearity is a condition that arises when two indicators are highly correlated, or there is a high correlation value between two items (Garson, 2016). Collinearity problems can also arise in reflective measurements, especially at the structural model testing stage, if excessive indicators are used as single items to measure two (or more) constructs. If this happens, researchers need to eliminate redundant indicators (Hair et al., 2014).

Collinearity measurement uses a bootstrapping procedure to calculate the VIF. VIF measures the severity of collinearity between indicators in the structural model. The threshold value to determine collinearity is that the VIF value must be greater than 5.00 (Garson, 2016). Collinearity is considered not to occur if the VIF value is less than 5.00 (Hair et al., 2020).

Table 4.9
Variation Inflation Factor

Path	Inner VIF
Confirmation → Perceived Usefulness	1.000
Confirmation → Satisfaction	1.000
Confirmation → Trust	1.882
Continued Intention → Habit	1.000
Incentives → Trust	2.425
Perceived Security → Trust	2.522
Perceived Usefulness → Continued Intention	2.368

Table 4.9 continued

Path	Inner VIF
Satisfaction → Continued Intention	3.042
Trust → Continued Intention	2.241
Wide Acceptance → Trust	2.218

In Table 4.9, satisfaction has the highest VIF value (3,042), which assumes a constant VIF value below the threshold value of 5.00. This value indicates that collinearity has not reached a critical level, and it is not a problem to measure the significance of the PLS-PM for the continued use of e-wallets. In SmartPLS, VIF calculation uses a blindfolding procedure with seven iterations.

4.5.2 Significance of Structural Model

The second criterion assesses the relationship's significance and relevance in the structural model. The path coefficient value is obtained from the bootstrapping procedure, which estimates the hypotheses between constructs. The path coefficient describes the contribution or influence between construct variables, and the path coefficient is obtained through the bootstrapping procedure to determine the standard error. The results of the standard error calculation will produce a t-value; the t-value results from dividing the correlation value by the standard error. The t-value determines the acceptance of the hypothesis set at the beginning of the study. Determination of the acceptance of hypotheses is by using the beta value; if the beta value is positive, then the hypothesis is accepted, and if the beta value is negative, then the hypothesis is likely to be not accepted.

Based on Table 4.10, the calculation results show one hypothesis that is not accepted, H4, which is on perceived usefulness-continued intention path. This rejection is because the critical t-value is below 1.645, i.e., 0.648 and the path has a confidence interval value between negative and positive values (-0.055 and 0.132).

Table 4.10
Summary of Hypotheses Testing

Hypothesis	Path	Std Beta	Std Error	t-values	Bias	Confidence Interval		Decision
						0.05	0.95	
H1	Co → Us	0.741	0.024	30.082	0.001	0.696	0.777	Supported
H2	Co → Sa	0.731	0.023	30.989	0.002	0.688	0.766	Supported
H3	Co → Tr	0.212	0.049	4.390	0.001	0.128	0.289	Supported
H4	Us → CI	0.036	0.057	0.655	-0.001	-0.055	0.132	Not supported
H5	Sa → CI	0.586	0.054	11.021	0.002	0.493	0.671	Supported
H6	Tr → CI	0.178	0.065	2.731	0.000	0.066	0.279	Supported
H7	In → Tr	0.138	0.040	3.400	0.002	0.069	0.202	Supported
H8	Sc → Tr	0.463	0.040	11.179	0.002	0.394	0.527	Supported
H9	Wa → Tr	0.184	0.061	3.0006	-0.003	0.093	0.293	Supported
H10	CI → Ha	0.730	0.026	28.226	0.002	0.683	0.768	Supported

Note: $p \leq 0.05$ (one tailed test)

CI = Continued Intention; Co = Confirmation; Ha = Habit; In = Incentives; Sa = Satisfaction; Sc = Perceived Security; Tr = Trust; Us = Perceived Usefulness; Wa = Wide Acceptance

H1: Consumers' confirmation has a positive effect on consumers' perceived usefulness of the e-wallet

Based on the results of the bootstrapping procedure in Table 4.10, H1 is accepted. The critical t-value is above 1.645, i.e., 30,082, and the confidence interval value above zero is 0.696 to 0.777. It assumes that all e-wallet consumers confirm the use of the e-wallet based on perceived usefulness.

H2: Consumers' confirmation has a positive effect on consumers' satisfaction with the e-wallet

Based on the results of the bootstrapping procedure in Table 4.10, H2 is accepted. The critical t-value is above 1.645, i.e., 30.989, and the confidence interval value above zero is 0.688 to 0.766. It assumes that all e-wallet consumers confirm using the e-wallet based on satisfaction.

H3: Consumers' confirmation has a positive effect on consumers' trust in the e-wallet

Based on the results of the bootstrapping procedure in Table 4.10, H3 is accepted. The critical t-value is above 1.645, i.e., 4.390, and the confidence interval value above zero is 0.128 to 0.289. Trust is a construct added to the ECM model, and the results show that confirmation is positively related to trust.

H4: Perceived usefulness has a positive effect on continued intention of e-wallet usage

Based on the results of the bootstrapping procedure in Table 4.10, H4 is rejected because the critical t-value is below 1.645, i.e., 0.655, and the confidence interval value is around zero, i.e., -0.055 until 0.132. The comparison of the confidence interval values shows that the range of values is in negative and positive numbers; so, there is a possibility that the beta value will be zero, which means the effect of the variable is not significant. It assumes perceived usefulness does not support the continued usage of e-wallets.

H5: Consumers' satisfaction has a positive effect on continued intention of e-wallet usage

Based on the results of the bootstrapping procedure in Table 4.10, H5 is accepted. The critical t-value is above 1.645, i.e., 11.021, and the confidence interval value above zero is 0.493 to 0.671. It assumes that satisfaction positively affects the continued intention of e-wallets.

H6: Consumers' trust has a positive effect on consumers' continued intention to use an e-wallet

Based on the results of the bootstrapping procedure in Table 4.10, H6 is accepted. The critical t-value is above 1.645, i.e., 2.731, and the confidence interval value above zero is 0.066 to 0.279. Even though trust is an additional construct for ECM, trust has a positive effect on the continued intention of e-wallets.

H7: Incentives have a positive effect on consumers' trust

Based on the results of the bootstrapping procedure in Table 4.10, H7 is accepted. The critical t-value is above 1.645, i.e., 3.400, and the confidence interval value is above zero, i.e., 0.069 to 0.202. It assumes that incentives have a positive effect on trust.

H8: Perceived security has a positive effect on consumers' trust in the e-wallet

Based on the results of the bootstrapping procedure in Table 4.10, H8 is accepted. The critical t-value is above 1.645, i.e., 11.179, and the confidence interval value is above zero, i.e., 0.394 to 0.527. It assumes that perceived security has a positive effect on trust.

H9: Wide acceptance has a positive effect on consumers' trust in the e-wallet

Based on the results of the bootstrapping procedure in Table 4.10, H9 is accepted. The critical t-value is above 1.645, i.e., 3.006, and the confidence interval value is

above zero, i.e., 0.093 until 0.293. It assumes that wide acceptance has a positive effect on trust.

H10: Continued intention of e-wallet has a positive effect on consumers' habit of using it

Based on the results of the bootstrapping procedure in Table 4.10, H10 is accepted. The critical t-value is above 1.645 (Hair et al., 2017d), i.e., 28.226, and the confidence interval value is above zero, i.e., 0.683 until 0.768. It assumes that the continued intention of e-wallet positively affects the habit of e-wallet usage.

In sum, this study finds that confirmation significantly affects continued intention indirectly through satisfaction (H2), perceived usefulness (H1) and trust (H3). These two factors (satisfaction and trust) significantly affect continued intention (CI) directly, (H5 and H6). One factor does not support the CI directly, namely perceived usefulness (Us). Moreover, perceived security, incentives, and wide acceptance influence trust, and also, significantly affect CI indirectly. Furthermore, the continued intention of e-wallets affects directly the habit of using an e-wallet.

4.5.3 Coefficient of Determination (R-Squared)

The third assessment of the structural equation model was to determine the value of R-Squared. The value of R-Squared is the value of the coefficient determinant, where this value will describe the predictive power of endogenous variables from the structural model (Hair et al., 2017c). Researchers must evaluate the prediction accuracy of the model through the R-Squared value. R-Squared value can interpret the combined effect of exogenous variables on endogenous variables. In other words,

it represents the variance in the endogenous construct explained by all the associated exogenous variables. The rule of thumb of coefficient of determination is below 0.25, which is considered as a weak effect; between 0.26 and 0.74, as moderate, and above 0.75, as substantial effect on exogenous latent variables in predicting endogenous latent variables (Hair et al., 2018).

Table 4.11 concludes that confirmation influences satisfaction by 63.1%, indicating a moderate influence, in that confirmation has fulfilled 63.1% of satisfaction, leaving 36.1% from constructs not discussed in this study. Perceived usefulness is by 54.9%, which has a moderate effect, and together, perceived security, incentives, and wide acceptance affect trust by 75.6%, meaning that all three constructs strongly influence trust. Continued intention is influenced by 56.7% by perceived usefulness, satisfaction, and trust, while continued intention affects habit by 53.3%. The conclusion based on Table 4.11 is that R-Squared has a moderate value, except for trust, which is influenced by its antecedents in substantial values.

Table 4.11
Coefficient Determination

Predictor	Endogenous	R-Squared	% Of Variances
Confirmation	Perceived usefulness	0.549	54.9%
Confirmation	Satisfaction	0.631	63.1%
Confirmation	Trust	0.756	75.6%
Perceived security			
Incentives			
Wide acceptance			
Perceived usefulness	Continued intention	0.567	56.7%
Satisfaction			
Trust			
Continued intention	Habit	0.533	53.3%

Overall, the influence of all exogenous constructs contributed 53.3% to habits, which shows that habits can be formed from continued intentions, 53.3% and 46.7% of

which are influenced by constructs not present in this study. In addition, this model confirms that trust, satisfaction, and perceived usefulness influence the continued usage intention of e-wallets.

4.5.4 Assessing of Effect Size

In addition, to evaluating the R-Squared value, there is a step to calculate the effect size (f^2) to assess the adequacy of the theory. Path coefficients must undergo measurement of effect sizes to estimate the extent to which their presence is required, precisely whether or not the omission of each construct has a substantial effect on the endogenous variables.

There is a step to calculate the effect size (f^2) to assess the adequacy of the theory. f^2 aims to prevent researchers from over-accommodating information on changes in the R-Squared value, thereby limiting efforts to generalise the results to other models (Hair et al., 2018). Changes in the value of R-Squared, when certain exogenous constructs are omitted from the model, can be used to evaluate whether or not substantively omitted constructs impact endogenous constructs. The effect size function is to see the contribution of each exogenous to the endogenous. f^2 , as a sample predictive metric, estimates the predictive ability of each independent construct in the model. This value is calculated by the SmartPLS application, which automatically deletes each predictor construct, and a new R-Squared value calculates without the predictor.

Furthermore, this study compared the value of R-Squared with predictors to R-Squared without predictors. The difference between the two R-Squared values shows that the omitted construct is a significant predictor of the dependent construct (Hair

et al., 2017e). f^2 is categorised into three levels: small, with values ranging from 0.02 to 0.15; medium, with a range of 0.15 to 0.35; and large, with values above 0.35 (Hair et al., 2020).

Table 4.12
Effect Size for Path Model

Hypothesis	Path	f^2	Effect Size
H1	Confirmation → Perceived usefulness	1.218	large
H2	Confirmation → Satisfaction	1.149	large
H3	Confirmation → Trust	0.076	small
H4	Perceived usefulness → Continued Intention	0.001	not significant
H5	Satisfaction → Continued Intention	0.244	moderate
H6	Trust → Continued Intention	0.064	small
H7	Incentives → Trust	0.022	small
H8	Perceived Security → Trust	0.453	large
H9	Wide Acceptance → Trust	0.046	small
H10	Continued Intention → Habit	1.140	large

After knowing the value of the coefficient of determination, based on Table 4.12, confirmation contributes to perceived usefulness (1.218) and satisfaction (1.149), in contrast to confirmation's contribution to trust (0.076), which is in the small category.

The effect size value for antecedents of trust shows that incentives have a minor contribution (0.022) compared to wide acceptance (0.046), while perceived security makes a significant contribution to trust (0.453). The antecedent that contributes the most to continued intention is satisfaction (0.244), which contributes moderately compared to trust (0.064), which only contributes weakly. Perceived usefulness does not make a significant contribution (0.001); it strengthens the previous hypothesis (see Table 4.10) that perceived usefulness does not affect continued intention. Finally, continued intention makes an immense contribution to habit.

4.5.5 Assessing Predictive Relevance

Predictive relevance (Q^2) is the measure of predictive power through cross-validation redundancy (Hair et al., 2020). Predictive relevance (Q^2) or predictive sample reuse is a calculation to validate the endogenous construct model (Goodness of Fit Model). The value of Q^2 on the endogenous variable is good fit model if the value is higher than the exogenous variable. Stone-Geisser Q^2 scores can estimate the predictive relevance of each construct by systematically eliminating the relationships and using mean substitution to filter for differences in model composition (Hair et al., 2017b). If the value of Q^2 is more than zero for a particular endogenous latent variable, it establishes the predictive relevance of the path model for that particular construct.

The Q^2 calculation is obtained from the blindfolding procedure, which generates a cross-validated redundancy estimation construct using omission distance. Omission distance is an input criterion before performing the blindfolding procedure. Hair et al. (2017c) recommended choosing omission distance between five and 10, assuming the sample size divided by omission distance is not an integer. This study used the value of seven as the omission distance because dividing the sample size by seven did not produce an integer.

When interpreting the value of predictive relevance, the value must be above zero, i.e., between 0.25 and 0.50 is medium, and above 0.50 is large. If it is less than zero, it indicates a lack of predictive relevance (Hair et al., 2020).

Table 4.13
Predictive Relevance

Construct	Q²
Continued Intention	0.359
Habit	0.323
Perceived Usefulness	0.339
Satisfaction	0.347
Trust	0.568

Based on Table 4.13, all endogenous constructs are above the zero thresholds, which indicates medium predictive relevance. The trust model has a large predictive value, indicating that trust ($Q^2=0.568$) can explain the model better.

4.6 Chapter Summary

This chapter presents the analysis of the data collected. This analysis begins with data processing, including data collection, data analysis management, and normality assessment. This is followed by a descriptive analysis that explains the respondents' profile, use of e-wallets and products in Indonesia, based on the questionnaire section. The final part is the PLS-SEM calculation which consists of assessing the measurement model to determine whether or not the questionnaire items and their constructs meet acceptable criteria to proceed to the structural model assessment. PLS-PM was modified to meet the validity and reliability criteria, by reducing items Sa4, Sa5, In7, Tr1, Tr2, Tr3 dan Tr10. Then, the next step was to test the hypotheses and interpret the results for each relationship. The final part of this section summarizes the hypotheses findings, where nine hypotheses are supported, and only one is not supported.

CHAPTER FIVE

DISCUSSION AND CONCLUSION

5.1 Introduction

The main objective of this study is to develop a model of consumers continued intention to use e-wallets and make e-wallet usage a transaction habit in Indonesia. Therefore, this chapter discusses the achievement of each research question. In addition, this chapter explains the theoretical and practical contributions, followed by an explanation of the study's limitations and recommendations for further research. This chapter ends with the summary of the study.

5.2 Summary of Research Achievements

The study focuses on the continued intention to use e-wallets in Indonesia from the perspective of e-wallet users. This study supports the government's movement towards a cashless society by examining how repeated use of e-wallets can create new habits in Indonesian society, such as using e-wallets for every payment transaction. Specifically, this study discusses the factors that cause someone to use e-wallets continuously and highlights trust as a crucial new construct, while investigating explanatory variables, namely perceived security, incentives, and wide acceptance. The findings of this study are of significance, as they shed light on the factors influencing e-wallet continued usage intention and the pivotal role of trust in e-wallet usage.

The continuous use of e-wallets can lead to the habit of always using e-wallets in the future. The primary aim of this study is to develop a robust model of consumers continued intention to use e-wallets and to establish e-wallet usage as a transaction

habit in Indonesia. This chapter discusses the achievement of each research question and the study's theoretical and practical contributions. It also outlines the study's limitations and provides recommendations for further research. The chapter concludes with a summary of the study's findings.

Several research stages were passed to achieve the research objectives, namely identifying factors that influence the continued intention that is answered in the first, second, and third questions. In trying to answer these three questions, this study conducted a literature review by considering the previous e-wallet research model, i.e., the Consumer Continued Intention Model, to derive a research model. This model was tested using the PLS-SEM method, which has two stages of testing, namely measurement assessment and structural assessment. The test results are that: (1) perceived usefulness, satisfaction, and trust can explain the continued intention variable well; (2) perceived security, incentives, and wide acceptance can explain the trust variable very well, thus strengthening the consumers' continued intention to use the e-wallet; and (3) continued intention can influence habits towards using e-wallets.

5.2.1 Research Question 1

This research began with the question: "What are the factors that significantly influence people's intention to continue to use e-wallets for daily transactions?". This study finds that satisfaction and trust affect e-wallet continued intention usage based on the results presented in the previous chapter. In contrast, perceived usefulness affects e-wallet use indirectly through satisfaction and trust.

The ECM uses the confirmation construct as a marker that consumers have used an e-wallet, even if only once. From the experience of transactions with e-wallets,

further use of e-wallets will be confirmed and affects perceptions of usefulness, satisfaction, and trust. Furthermore, satisfaction and trust affect continued intentions.

Confirmation

The results show that confirmation positively and significantly affects perceived usefulness, satisfaction, and trust. A significant relationship between confirmation and perceived usefulness and satisfaction is in line with the results of previous studies, including by Akter et al. (2013) on m-health services; Chen et al. (2013) on mobile services; Oghuma et al. (2016) on mobile instant messaging in South Korea; Hadji and Degoulet (2016) on the Clinical Information Systems project in France; Susanto et al. (2016) regarding cell phone banking services; and Park et al. (2017) on m-payment services. The relationship between confirmation and trust have been confirmed by findings of prior studies by Akter et al. (2013) on m-health services and by Susanto et al. (2016) regarding cell phone banking services.

Satisfaction

In this study, satisfaction is the main factor for reusing e-wallets. These results are in line with the findings of previous studies, such as by Oghuma et al. (2016) on mobile instant messaging; and Hadji and Degoulet (2016) on the Clinical Information Systems project in France. Consumer satisfaction is an essential factor determining a particular cell phone service's success and continued intention to use the e-wallet (Bhattacharjee, 2001b). Satisfied consumers will tend to have continued intention to use e-wallet services in the future as opposed to dissatisfied consumers.

This study finds that most e-wallet consumers are satisfied with the services provided by e-wallets. It can be seen in Table 4.4 that 70.76% of respondents have experience

of more than 12 months transactions with e-wallet. Satisfaction with using an e-wallet can be divided into two: satisfaction with a specific type of e-wallet, which indicates that consumers are consistent in using the e-wallet from the beginning to the time of distribution of the questionnaire. It can be seen that many consumers who used Gopay as their first experience, utilise an e-wallet (30.99%) and keep it as an e-wallet that is often used for their transactions (38.35%). This finding is consistent with a poll by Ipsos (Ipsos, 2020), that most respondents used Gopay as their first e-wallet, and most of them were still using Gopay at the time of the poll. Secondly, consumers continued to utilise e-wallets until now, but they have changed the e-wallet provider several times.

Trust

This study added the construct of trust as part of the antecedents to forming continued intentions. These results are in line with the findings of previous studies, such as Shaw's (2014) study on cell phone wallets in Canada; research by Kumar et al. (2018) about m-wallets in India; and the research of Shao et al. (2018) in China. Low trust can be a significant barrier to mobile service acceptance and trust in providers or MNOs will increase the desire to transact with e-wallets.

Perceived Usefulness

This study finds that perceived usefulness has no significant effect on continued intention to use an e-wallet. This result is different from that of Bhattacharjee (2001b). The ECM shows that perceived usefulness has a significant relationship with continued intention. Several researchers have adapted the ECM, such as Thiruselvi et al. (2013), who researched e-HRM; Zhou (2013) who focused on

mobile Internet service providers; Akter et al. (2013) who studied e-health; and Park et al. (2017) who researched m-payment systems.

Research that stated that perceived usefulness does not affect continued intentions includes by Islam et al. (2017) on social networking sites; Luqman et al. (2016) on m-commerce; and Kim et al. (2014), who researched cellular communication. These researchers have shown that perceived usefulness does not directly affect continued intentions but satisfaction.

Although the significance between perceived usefulness and continued intentions is low, this does not mean people have quit transacting with e-wallets. People opined that the usefulness of e-wallets did not meet their needs, but they were satisfied using them. Some studies have modified the perceived usefulness relationship by relating perceived usefulness and satisfaction, something that did not exist in the early ECM model proposed by Bhattacharjee (2001b). Several studies that have added to the relationship between perceived usefulness and satisfaction are by Hung et al. (2012), who researched m-shopping; Kim et al. (2014) on mobile communication applications in South Korea; Luqman et al. (2016) on m-commerce in Malaysia; Islam et al. (2017) regarding information technology usage; Phonthanakitithaworn et al. (2015) on e-wallet usage in Thailand; Oghuma et al. (2016) on mobile instant messaging; Hadji and Degoulet (2016) on the Clinical Information Systems; Park et al. (2017) on m-payment systems; Chen et al. (2012) on mobile applications; Chen et al. (2013) on mobile services; Susanto et al. (2016) on cellular phone banking services; and Akter et al. (2013) on m-health services.

This study finds that there is no significant relationship between perceived usefulness and continued intentions as shown by the low frequency of transactions using e-wallets, which is 1-3 times a week (68.86%). This shows that consumers do not transact using e-wallet every day. The results of this study are in tandem with the research of Luqman et al. (2016) that the low frequency of using m-commerce causes the low significance between perceived usefulness and continued intention.

Phonthanukitithaworn et al. (2015) examined e-wallet acceptance in Thailand and found no significant effect on perceived usefulness. According to them, Thai people prefer to use cash or credit card transactions because they consider these two payment methods as more useful than e-wallets. Another possibility is that consumers did not feel that they had benefited from using e-wallets and were not satisfied with e-wallet transactions; therefore, they stopped using the e-wallet (Kalbuana et al., 2022). However, some situations force consumers to use e-wallets. First, there is coercion from certain parties to use e-wallets. For example, public service payment methods are only performed through e-wallets, such as for the Mass Rapid Transit (MRT) (Setiyono, 2021) and toll payments (Mulyani & Davronov, 2023; Setiyono, 2021). In the second situation, service companies require consumers to use e-wallets for payment transactions (Setiyono, 2021). This situation is summarized in Table 4.4: 1.02% of consumers stated that they use e-wallets for other reasons, such as workplace requirements for specific e-wallet platforms.

Finally, based on assumptions by Humbani and Wiese (2019), consumers are motivated by the possible benefits they will get in the future as compared to the benefits they have felt in the past. Users hope for features that are more useful for

them, and so, this will create competition between e-wallet providers in offering benefits.

5.2.2 Research Question 2

The second question posed by this study is: "What are the significant trust antecedents to people's continued intention to use e-wallets?". This study finds that perceived security, incentives, and wide acceptance affect trust.

Incentives

This study used incentives as an antecedent of trust, and the results show a significant relationship between incentives and trust. Trust is psychologically significant for loyalty, and consumers need to accept the risks that arise from online transactions. Even though providing incentives does not motivate behaviour or is irrelevant for individuals, incentives can still motivate consumers to use e-wallets. The provision of incentives is expected to increase consumer loyalty to use e-wallets through trust.

It is known that credit cards have the highest transaction fees, while the lowest is for e-wallets, but using cash is still cheaper than all payment schemes (Hayashi & Bradford, 2014). In order to enhance e-wallet utilisation, the costs incurred due to e-wallet transactions must be covered with things that benefit the consumer, such as discounts, cash-back, and rewards. In this study, 35.78% of the respondents stated that promotional programs, such as discounts, cash-back, or bonus points, influence them to transact with e-wallets.

Perceived Security

In this study, the relationship between perceived security and trust received special treatment compared to the relationship between loyalty incentives and trust, and wide acceptance and trust. After calculating using PLS-SEM, it is found that the HTMT value between perceived security and trust is higher than 0.95. According to Henseler et al. (2015), the assumptions between the perception of security and trust are the same. Alternatively, it can be said that consumers will think about security issues while discussing trust. In order to pursue the value of HTMT as a PLS-SEM criterion, some confidence criteria must be omitted because they are closer to the perceived security criteria. From this circumstance, it can be stated that perceived security is a predictor of trust. This assumption is similar to Chawla and Joshi (2019). In Table 4.4, 11.53% of respondents stated that one reason they use e-wallets is the security offered by the provider.

In addition, this finding is in line with the research of Susanto et al. (2016), who found that the perception of security significantly affects trust. Security has an undeniable role in the perception of security because e-wallet transactions involve sensitive financial information; so, it is imperative to ensure that e-wallet transactions using cell phones are secure (Susanto et al., 2016).

Wide Acceptance

This study finds that wide acceptance strongly affects trust. The escalation of consumer loyalty to continue using e-wallets is related to the construct of wide acceptance, defined as an e-wallet covering a wider area and the frequency of transactions using e-wallets. In Table 4.4, the highest frequency of e-wallet usage is

1-3 times a week (68.86%). This value is relatively low because transactions are not being carried out every day. Most of the use of e-wallets is for ordering food (24.11%) and transportation (19.133%), which can be done daily. In addition, the volume of transactions using e-wallets is still low at under IDR 1,500,000 (77.54%).

There are three entities in a m-payment system: telecommunication providers/ Mobile Network Operators (MNOs), e-wallet service providers, and cellular network technology (Xin et al., 2013). Telecommunication providers are institutions that provide communication networks used in e-wallets. The provider's profit is derived from using this network during e-wallet transactions. Companies that provide e-wallet services in Indonesia are MNOs, bank institutions, and fintech companies.

First, MNOs benefit from the frequent use of telecommunications networks. In this regard, MNOs are fascinated with expanding the e-wallet usage area and enhancing their transactions. Second, bank institutions have the convenience of conducting e-wallet-based financial transactions, because banks already have card payments services, for example credit cards and debit cards. In addition, they have an online banking service. These existing services minimize the e-wallet investment costs. As for fintech companies, constrained by limited resources, have adopted creative strategies to market their products. However, their growth is hindered by government regulations, including limitation of the amount of funds they can receive from consumers and the costs associated with telecommunications services. Despite these challenges, fintech companies are aggressively promoting e-wallet transactions. In Indonesia, e-wallet products from fintech companies are more widely used than e-

wallets from banks and MNOs. This study shows that Gopay, OVO, and Dana e-wallets owned by fintech companies among the top transaction in Indonesia.

The widespread of e-wallet transactions is closely linked to the role of merchants offering e-wallet payment options. By providing this alternative, merchants have facilitated wider consumer access to use e-wallet. As shown in Table 4.4, 24.03% of respondents indicated that they use e-wallets primarily because many merchants support e-wallet payments.

5.2.3 Research Question 3

The third question of this research is: "Does consumer trust affect strengthening continued intentions to use e-wallets for daily transactions?". The test results indicate that trust is one of the reasons someone continues with the intention to use e-wallets for the first time and forever. When the relationship between perceived usefulness and continued intention is insignificant, trust can indirectly increase the significance of perceived usefulness and continued intention.

Moreover, the indicators used in this research shed light on the factors that influence respondents' trust in using e-wallets. It is evident that respondents' trust in e-wallets is significantly influenced by the providers, merchants, and regulations, underscoring the importance of these factors in building consumer trust.

5.2.4 Research Question 4

The last question of this research is: "Does the continued intention to use e-wallets affect a customer's habit?" Based on the results of bootstrapping calculations, there is an influence between continued intention and habit. This finding is in line with

Bhattacharjee and Lin (2015), who stated that habit is a manifestation of repeated use that will lead to continuous behaviour.

This study used the ECM to determine whether or not someone will continue to use an e-wallet after using it for the first time. Furthermore, after continuously using an e-wallet, it will become a habit for consumers to transact using an e-wallet. This research is aligned with Gardner and Lally (2018), who posited that one of the habit-formers is consistent action. This means that the actions of consumers who consistently use e-wallets will cause new habits in transactions.

This study supports the findings of Chimamiwa et al. (2019), which suggest that habit formation can be observed through the frequency of behaviours and events that may after those behaviours. During this study, the COVID-19 pandemic occurred, influenced people increased use of e-wallets as a payment method. Another finding about habit were reported by Kim and Malhotra (2005), who note that certain continuations of information technology usage become habitual based on repeated behaviour patterns that are automatically triggered by environmental cues. Transaction behaviour using e-wallets during the pandemic is expected to become a habit in normal times.

5.3 Research Contributions

This study has several theoretical and practical implications, especially for increasing the usage of the e-wallet.

5.3.1 Theoretical Contributions

This study's objective is to comprehend better the factors influencing consumers' utilising e-wallets. This study differs slightly from other ECM studies. The relationship between perceived usefulness and continued intention is not significant; while the relationship between perceived usefulness and continued intention is significant in the original ECM model. The result led to a modification of the proposed model by adding a new relationship between perceived usefulness and satisfaction; it is in line with previous studies, such as research by Hung et al. (2012), Kim et al. (2014), Luqman et al. (2016), and Islam et al. (2017). The results show that the relationship between perceived usefulness and satisfaction is significant; there is an indirect relationship between perceived usefulness and continued intention through satisfaction (Tam et al., 2018).

This study explored trust in the research model. The first step was to add three constructs as antecedents of trust (perceived security, incentives, and wide acceptance). The results of the study show that trust increases after the addition of the antecedents. Without the antecedent constructs, the calculation of R-squared trust has a value of 0.492. After adding the three constructs, perceived security, incentives, and wide acceptance, the value of R-squared trust is 0.754. This value means that the three constructs affect respondents' confidence by 75.4%. Perceived security is the construct that most influences trust when viewed from the HTMT value. The second stage was the addition of the relationship between perceived usefulness and trust because of the weak relationship between perceived usefulness and continued intention. The results of this investigation is the relationship between perceived

usefulness and trust. This means that consumers feel the benefits of the e-wallet based on the trust they feel when using the e-wallet, and so, they will keep using e-wallets.

This study also added habit as a construct after continued intention. This addition aimed to see whether or not continued intention would affect habits so that it could form new consumer habits to transact using e-wallets. The results show that continued intention influences around 53% of the respondents to make it a habit.

5.3.2 Practical Contributions

This study provides a practical contribution, namely by suggesting an increase in e-wallet transactions through promotional programs. E-wallet usage transactions in Indonesia are still low; therefore, this study assumes that the low significance of perceived usefulness means that e-wallet transactions are still lacking. This low transaction can be increased through daily transactions. Table 4.4 shows that the majority of e-wallet consumers allocate transactions for payment of food, purchase of goods, e-hailing, and transfer of funds. Increasing the frequency and volume of transactions can increase the impact of perceived usefulness on continued intention.

One way to increase the frequency of using e-wallets is the provider to offer promotional programs, that offer discounts, prizes, and cash-back, which can replace transaction fees. Through this promotion, consumers will feel that additional fees during transactions do not burden consumers. Ciptariato and Anggoro (2022) stated that consumers object to additional fees when transacting using e-wallets.

5.4 Limitations and Recommendation for Future Works

There are several limitations when conducting this research. However, these limitations become the basis for making improvements. First, the time of questionnaire preparation and data collection was before the COVID-19 was declared a pandemic, and one of the rejected hypotheses was the effect of perceived usefulness on continued intentions. This refusal indicates that consumers do not feel the benefits of e-wallets or that the costs incurred during transactions are still higher than the perceived usefulness. During the pandemic, people avoided using cash for fear of spreading the virus through paper money/coins (Valencia & Layman, 2021). Thus, the hypothesized results may differ for perceived usefulness.

In addition, this study focused on using e-wallets in Java Island, and not all cities on Java, as well as small cities in Indonesia. Based on statistical data, Indonesia has 98 cities and 416 districts, where the characteristics between one city and another can be different, and the coverage of the district area is broader than the city (Badan Pusat Statistik, 2020).

An alternative to increase e-wallet usage is to make it easier for merchants to provide e-wallet payment methods. In addition, one way that may be effective is to develop consumer-friendly applications (Dennehy & Sammon, 2015), because one of the consumers' challenges to using e-wallets is the lack of understanding of cell phones and the payment application itself. One way to remove these barriers is to educate consumers by providing quick references and downloadable application usage manuals to help consumers understand information technology and systems (Leong et al., 2013). Companies launching new products and services should consider a

learning process for consumers and merchants to make them understand better. Increasing consumer understanding of technology and information systems will increase trust (Arvidsson, 2014).

5.5 Conclusion

The ECM is a model that assumes satisfaction as the main predictor for reusing a technology. This study modifies the ECM by integrating different variables into the original model. Additional constructs of trust and its antecedents, and habit, were included in the model.

This study finds that respondents indicate that perceived usefulness does not affect their continued intention to use e-wallets. E-wallets have not become an alternative for daily payments because consumers' experience in using e-wallets is poor. The more the experience they have in using an e-wallet, the more they will feel the benefits. Another reason is that the benefits of using an e-wallet are less than the expense. The high cost of using e-wallets can be compensated through discounts, rewards, and cash-back. This program is not only for consumers, but also for merchants. E-wallet providers need to include merchants in promotional programs because merchants are at the forefront as providers to encourage consumers to transact with e-wallets as a payment method. The more the merchants that offer e-wallets as an alternative, the more consumers will accept the e-wallet. The challenge for merchants is the cost of purchasing a signal reader device and its compatibility. The ease with which merchants create an e-wallet payment scheme depends on the provider and government policies.

During the pandemic period where there were concerns with virus transmission, the use of e-wallet increased due to the way e-wallet is used by swapping or tapping the cell phone near the signal reader. When the pandemic phase became an endemic phase, the e-wallet usage is supposed to become a community habit.



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Appendix A

Questionnaire



Research Title: Factors that influence the intention to continue using E-wallet

Initial Statements

I invite you to participate in this research. This study aims to determine whether trust is one of the factors that causes someone to continue to intend to use an e-wallet and find out the antecedents of that trust. E-wallet is an electronic payment scheme that uses a mobile phone. The way to operate is to download the e-wallet application and install it into your mobile phone until finally registering with the provider according to the instructions given in the application.

Filling out this questionnaire only takes 7-10 minutes. It will help me formulate the factors that cause someone to continue using an e-wallet to become a habit in conducting financial transactions. All responses to this questionnaire are anonymous and will be kept confidential. This research will be used for academic purposes only. Your willingness to fill out this questionnaire will be considered as consent to participate in this research.

Thank you for your participation in filling out this questionnaire. If you have any questions, you can contact:

Citra Noviyasari
c.noviyasari@gmail.com

SECTION A: Exclusion Criteria Questions

Please tick [☐] against the appropriate responses or fill in the blanks with the appropriate

1. Have you ever downloaded an e-wallet application?

1. [☐] Y

2. [☐] N

2. Have you ever used an e-wallet?

1. [☐] Y

2. [☐] N

3. Which kind of e-wallet you used:

1. [☐] Go-pay

2. [☐] OVO

3. [☐] Dana

4. [☐] LinkAja

5. [☐] Jenius

6. [☐] Go-Mobile

7. Others, please write your answer:

SECTION B: Demographic Profile

Please tick [☐] against the appropriate responses or fill in the blanks with the appropriate

4. Gender:

1. [☐] Male

2. [☐] Female

5. Age:

1. [☐] under 15 years

2. [☐] 15 – 20 years

3. [☐] 21 – 30 years

4. [☐] 31 – 40 years

5. [☐] 41 – 50 years

6. [☐] > 50 years

6. City:

1. [☐] Jakarta

2. [☐] Bandung

3. [☐] Semarang

4. [☐] Yogyakarta

5. [☐] Surabaya

6. Others, please write your answer:

7. Education Level

1. [☐] Secondary school

2. [☐] Bachelor's degree

3. [☐] Post-graduate

4. [☐] Others, please write your answers :

8. Occupation

1. [☐] Students

2. [☐] Worker

3. [☐] Entrepreneur

4. [☐] Others, please write your answers :

9. Monthly income:

- | | |
|--|--|
| 1. ☐ > 7.500.000,- | 2. ☐ 5.000.001,- to 7.500.000,- |
| 3. ☐ 1.500.000,- to 5.000.000,- | 4. ☐ < 1.500.000,- |

10. Monthly expense:

- | | |
|--|--|
| 1. ☐ > 7.500.000,- | 2. ☐ 5.000.001,- to 7.500.000,- |
| 3. ☐ 1.500.001,- to 5.000.000,- | 4. ☐ < 1.500.000,- |

SECTION C: E-wallet Usage

Please tick [☐] against the appropriate responses or fill in the blanks with the appropriate

11. Do you have a bank account?

- | | |
|-------------------------------|-------------------------------|
| 1. ☐ Y | 2. ☐ N |
|-------------------------------|-------------------------------|

12. When the first time you use e-wallet:

1. ☐ Around 3 months ago
2. ☐ Between 3 – 6 months ago
3. ☐ Between 6 – 12 months ago
4. ☐ More than one year ago

13. What e-wallet you ever used: (You may tick more than one)

- | | |
|------------------------------------|---------------------------------------|
| 1. ☐ Go-pay | 2. ☐ OVO |
| 3. ☐ Dana | 4. ☐ LinkAja |
| 5. ☐ Jenius | 6. ☐ Go-Mobile |

7. Others, please write your answers:

If the e-wallet you are currently using is different from the e-wallet you have used, then are you willing to be contacted at any time for further interviews. If you agree to this, then the telephone number that can be contacted is:

14. If you have more than one e-wallet application, which e-wallet do you use the most

- | | |
|------------------------------------|---------------------------------------|
| 1. ☐ Go-pay | 2. ☐ OVO |
| 3. ☐ Dana | 4. ☐ LinkAja |
| 5. ☐ Jenius | 6. ☐ Go-Mobile |

7. ☐ Others, please write your answers:

15. Why do you prefer to use this e-wallet? (You may tick more than one)

1. ☐ Merchant choices are varying
 2. ☐ Top-up process is easier
 3. ☐ Has a cashback program, such as discount, cash back or bonus points
 4. ☐ Has a better security mechanism
 5. ☐ Others, please write your answers:
16. What is the most frequently used e-wallet? (You may tick more than one)
1. ☐ Transportation
 2. ☐ Food order
 3. ☐ Dine-in
 4. ☐ Groceries
 5. ☐ Monthly bill payment
 6. ☐ Online purchase
 7. ☐ Fund transfer
 8. ☐ Others, please write your answers :
17. How frequently do you use your e-wallet?
1. ☐ Every time. I do transactions when the e-wallet is accepted
 2. ☐ Most of the time depend on the e-wallet
 3. ☐ Sometimes, when I run out of my cash
 4. Others, please write your answers:
18. How frequent you use e-wallet in a week:
1. ☐ 1 - 3 times
 2. ☐ 4 – 6 times
 3. ☐ More than 6 times
19. How much you spend on e-wallet transactions in a month:
1. ☐ > 7.500.000,-
 2. ☐ 5.000.001,- to. 7.500.000,-
 3. ☐ 1.500.001,- to 5.000.000,-
 4. ☐ < 1.500.000,-

SECTION D: Survey Questions

Direction: Please answer the following questions using a 1 to 5 Likert scale with 1 – Strongly disagree, 2 –Disagree, 3 – Neutral, 4 – Agree, and 5 – Strongly agree. Please tick your answer to each question.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
A.	Confirmation	1	2	3	4	5

1.	My understanding of the rules for using the e-wallet is in accordance with the instructions given by the e-wallet provider.					
2.	My experience with using an e-wallet for making the payment was better than I had expected.					
3.	The service level provided by my e-wallet was better than what I expected.					
4.	The expectations that I had about e-wallet services were correct.					
5.	Expectations about e-wallet services are consistent.					
6.	Overall, most of the expectations from the use of e-wallets have been met.					
7.	Overall, most of my expectations from using an e-wallet were confirmed.					
B.	Perceived Usefulness	1	2	3	4	5
8.	Using an e-wallet would enable me to accomplish financial tasks quickly.					
9.	Using an e-wallet would enable me to accomplish payments quickly.					
10.	Using an e-wallet would enhance efficiency in making payments.					
11.	Using an e-wallet would enhance my effectiveness in making payments.					
12.	Using an e-wallet would make it easier for me to manage payments.					
13.	Using an e-wallet would make it easier for me to make payments.					

14.	Using an e-wallet would ease my monitoring expenses.					
15.	Overall, I find that e-wallets are useful for making payments.					
C.	Satisfaction	1	2	3	4	5
16.	I am pleased with the use of my e-wallet for making payments.					
17.	I think I did the right thing by deciding to use an e-wallet.					
18.	My choice to use a cellphone for an e-wallet was a wise one.					
19.	I feel frustrated during e-wallet transactions.					
20.	I feel terrible about my <i>e-wallet</i> .					
21.	I feel very convenient using an e-wallet.					
22.	I will recommend my chosen e-wallet to others.					
D.	Continued intention	1	2	3	4	5
23.	I expect my use of the e-wallet to increase in the future.					
24.	I intend to use the e-wallet in the future.					
25.	I will use all offered functions in an e-wallet.					
26.	I will always try to use the e-wallet.					
27.	I plan to use the e-wallet frequently.					
28.	I will consistently use an e-wallet even though there is no promotional program.					
E	Trust	1	2	3	4	5

29.	I trust e-wallet systems to be reliable.					
30.	I trust e-wallet systems to be secure.					
31.	Even if the e-wallet is not monitored, I will trust them to do the job correctly.					
32.	I trust the security mechanisms of e-wallets.					
33.	I trust e-wallet services.					
34.	I trust the information provided during the e-wallet process.					
35.	I believe in the good intentions of merchants/stores in providing e-wallet services.					
36.	I trust e-wallet providers' reputations.					
37.	I believe in the transparency of the e-wallet usage rules provided by the e-wallet provider.					
38.	Overall, I believe that e-wallet does not harm consumers.					
F.	Perceived Security	1	2	3	4	5
39.	I think this e-wallet service has mechanisms to ensure the safe transmission of its consumers' information.					
40.	I feel secure performing transactions using an e-wallet.					
41.	This e-wallet is a secure service through which to send sensitive information.					
42.	I feel assured that legal adequately protects me from problems with mobile technology.					

43.	I feel assured that technological structures adequately protect me from problems with mobile technology.					
44.	I feel confident that encryption and other technological safeguards on mobile technology make it safe for me to make e-wallet payments.					
45.	In general, the e-wallet provides a robust and safe environment to perform payments.					
G.	Incentives	1	2	3	4	5
46.	My e-wallet offers incentives for its continued use, such as rewards,					
47.	My e-wallet offers incentives for its continued use, such as cashback.					
48.	My e-wallet offers incentives for its continued use, such as bonus points.					
49.	I already understood the conditions for getting incentives.					
50.	E-wallet provides alternative payment innovations					
51.	I get continuous protection for using my e-wallet.					
52.	I will not use an e-wallet that does not provide incentives.					
H.	Wide Acceptance	1	2	3	4	5
53.	Many friends know about e-wallets.					
54.	I can easily find sellers that provide e-wallet payments.					
55.	Every store has a payment option with an e-wallet.					

56.	Many opportunities to pay using an e-wallet					
57.	There are many e-wallet facilities that I have used.					
58.	It is easy to top up the e-wallet.					
59.	Transferring funds via e-wallet is easy.					
I.	Habit	1	2	3	4	5
60.	I must use the e-wallet.					
61.	I do not even think twice before using an e-wallet.					
62.	Using an e-wallet has become natural to me.					
63.	When I paid for online transactions, using an e-wallet was an obvious choice for me.					
64.	My e-wallet always has enough funds to do transactions.					
65.	I feel weird doing cash transactions.					
66.	An e-wallet is a top priority for payment transactions.					

Appendix B
PLS Path Model



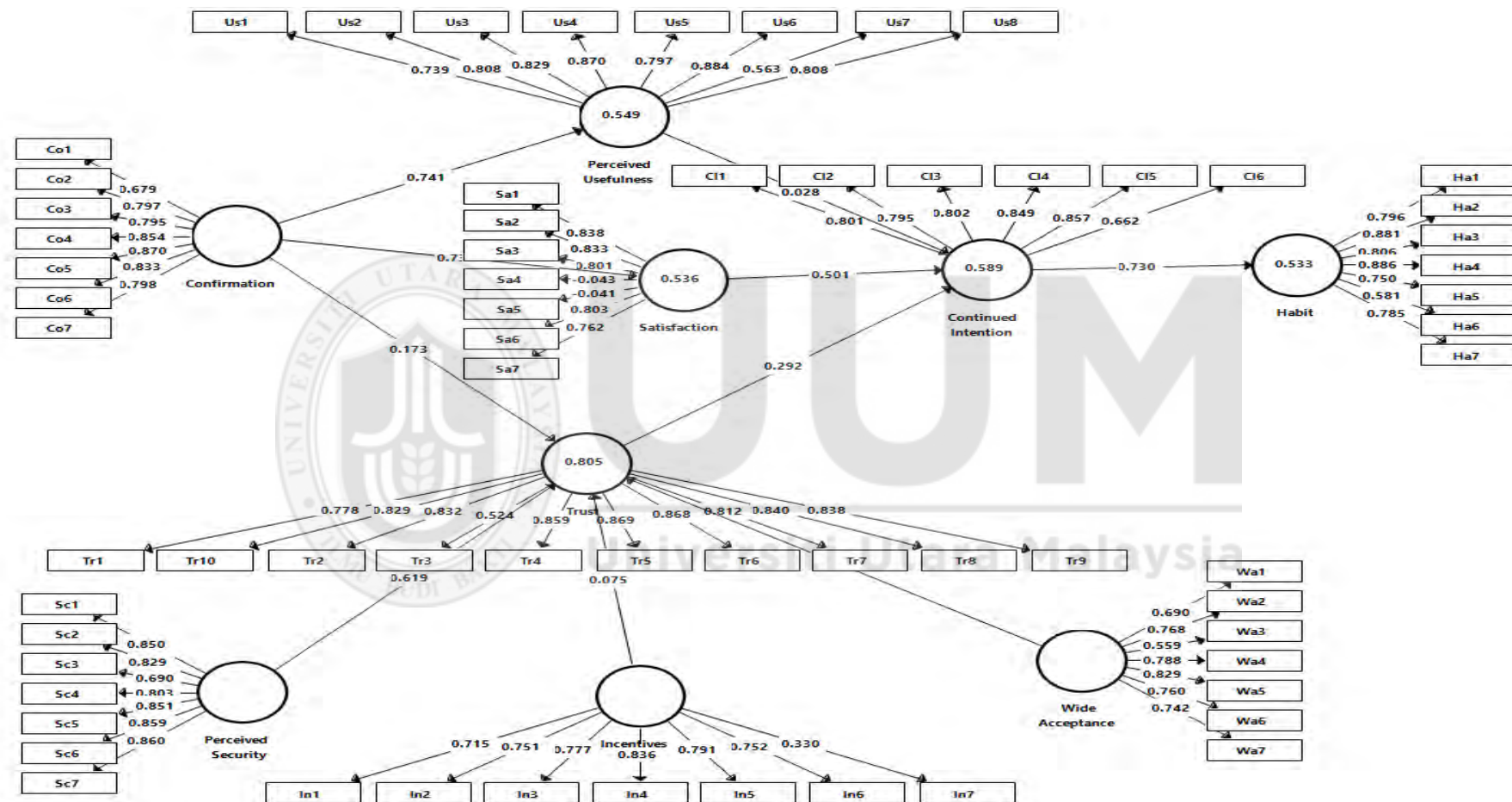


Figure B.1 Initial PLS Path Model

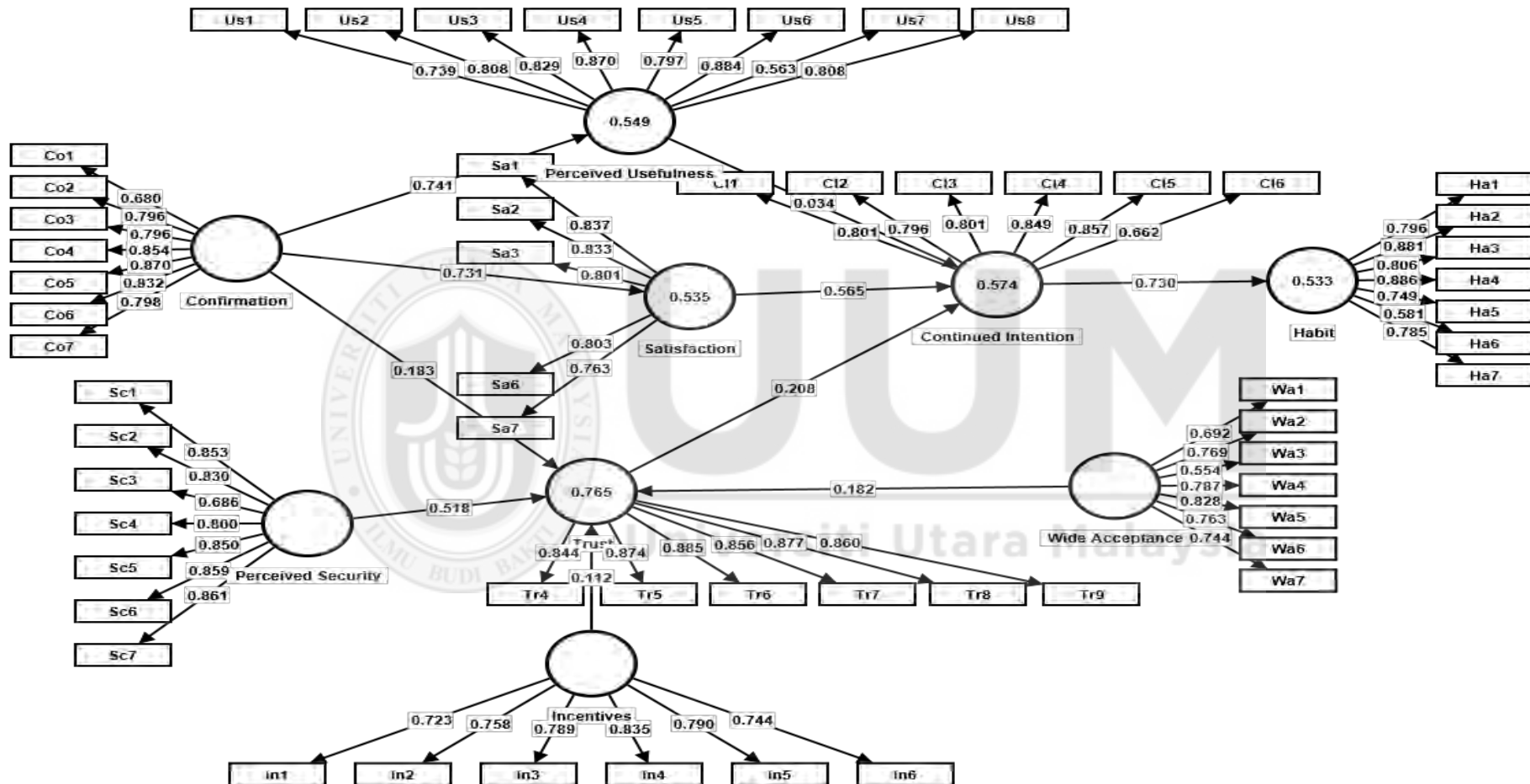


Figure B.2 Modified PLS Path Model

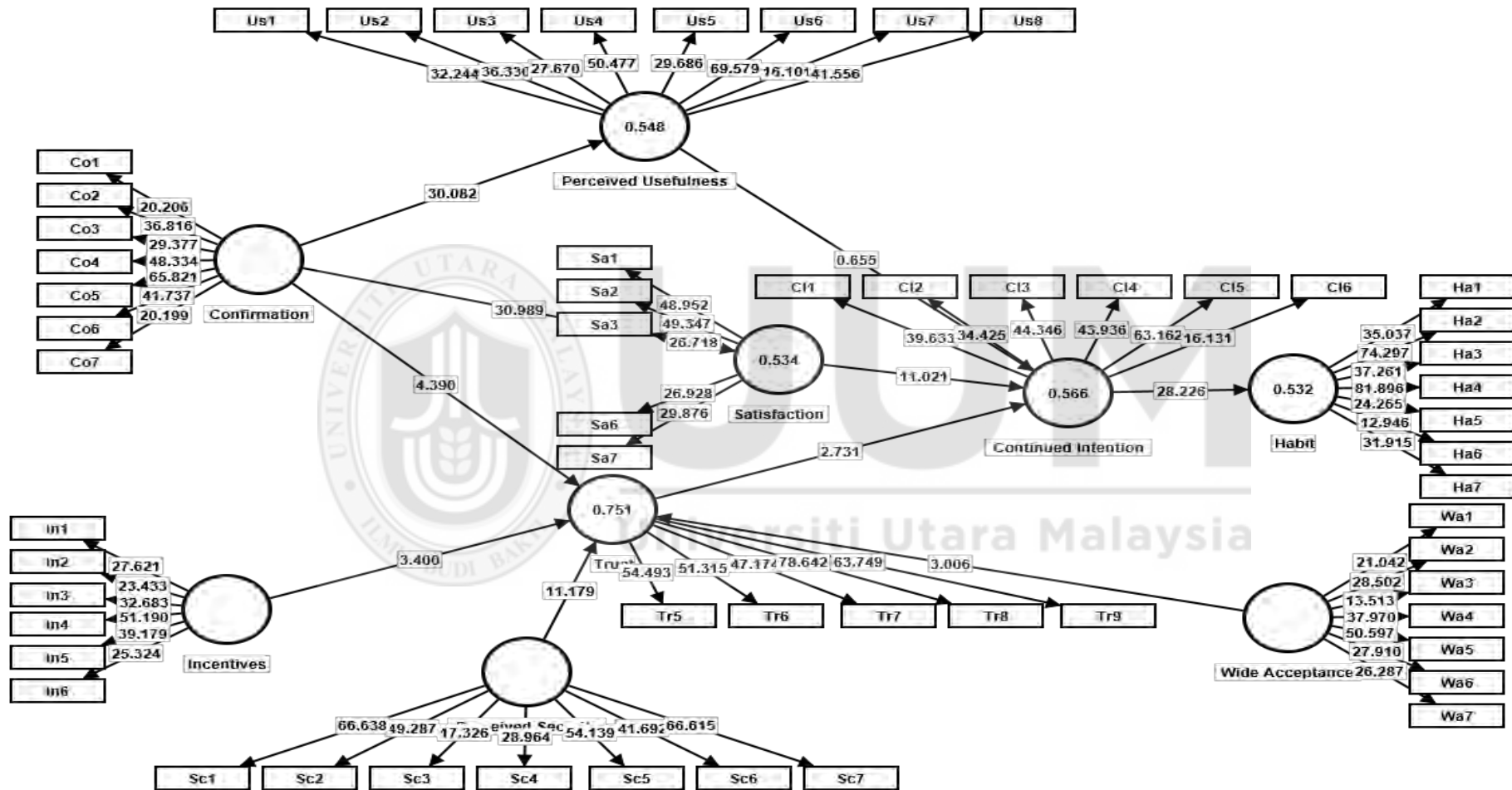


Figure B.3 PLS Path Model-Structural Model Assessment

