



Research article

The path to sustainability begins with going paperless: Antecedents of intention to use electronic wallet using serial mediation approach

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ABSTRACT

The expansion of E-wallet service providers in Indonesia is quite encouraging. In its report, Bank of Indonesia indicated that 48 E-wallet services are lawful. This is consistent with the number of E-wallet transactions, where USD 1.5 billion were recorded in 2018 and this number is expected to increase in 2023. This statistic increases the researcher's motivation to investigate E-wallet acceptability in Indonesia. The intention to use e-wallets among Indonesian adults must be studied in order to comprehend adoption factors, identify user preferences, inform marketing strategies, promote financial inclusion, and inform policy and regulatory decisions. This cross-sectional quantitative study conducted in Indonesia aimed to examine the factors influencing the formation of an intention to use electronic wallets (E-Wallets). It focused on perceived ease of use, perceived trust, perceived risk, perceived usefulness, social influence, compatibility, facilitating conditions, and perception of new technology. While previous studies have explored factors influencing users' intention to adopt electronic wallets, few have explicitly focused on mediating factors in the Indonesian context. This study fills this gap by investigating the mediating factors that affect Indonesian users' intention to adopt electronic wallets. It enhances the understanding of the direct factors influencing users' intention and sheds light on the complex relationships of other factors (mediators) that explain the underlying dynamics of this phenomenon. The study analyzed data from 384 valid participants using partial least squares and structural equation modeling with Smart PLS 4.0. The findings revealed that e-wallet facilitating conditions, perceived usefulness, perceived trust, compatibility, perception of risk, and perception of new technology positively and significantly influenced users' intention to use e-wallets in Indonesia. However, social influence and ease of use did not have a positive impact on e-wallet adoption intention among the Indonesian sample. The implications of this study suggest that e-wallet

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providers should prioritize balancing ease of use and security in their systems. If an e-wallet system is perceived as too easy to use, it may raise concerns about safety and unauthorized access, negatively affecting users' intention to adopt electronic wallets. Therefore, e-wallet providers should ensure user-friendly systems that address security concerns. Future research should explore other factors related to e-wallet adoption and assess their long-term effects on users' intention to use and adopt e-wallets. Despite its limitations, this study provides valuable insights for e-wallet providers, policymakers, and researchers in understanding electronic wallet adoption in Indonesia. It offers guidance for developing effective strategies and interventions to promote widespread adoption and use of electronic wallets.

1. Introduction

Neoliberalism has transformed every aspect of life in modern society. It provides a supportive platform for the adoption of technology and digitalization. The rapid rise of the digital revolution brings novel technologies that revolutionize our lifestyle, and the widespread penetration of mobile devices is one of them [1]. The improved reliability and advances in mobile services empower mobile users to use mobile services consistently [2]. This advancement is a package that comes from the Internet of Things technology [3]. Smart mobile devices are now arriving at many affordable prices, and 4G & 5G mobile technologies facilitate mobile users to enjoy internet-enabled services on mobile devices [4]. Mobile devices are becoming a notion of personal identity, and smart phones-based applications empower mobile users to make and receive payments instantly [5].

Mobile-based payment applications permit users to execute money transactions effortlessly and swiftly in a secure manner [1]. Users increasingly accept electronic wallet (E-wallet) to complete daily online transactions. E-wallet replicates physical wallet offers to perform different money transactions without cash [2]. An E-wallet enables users to complete the money transaction efficiently and secularly [4]. Using e-wallets enriches the users' experiences with comfort and ease to secularly transfer the payment or execute daily purchases [6]. The broad penetration of mobile-run payment systems empowers to reach poor, non-banking customers. It offers the ability to perform money transactions using mobile applications [7] conveniently. Unfailing mobile connectivity facilitates E-payment systems around the globe. Furthermore, the countries developed the regulatory framework to manage technology-based mobile payments [8]. Globally, more than US\$ 2 billion in transactions are made in E-payment systems daily, and the global E-payment users touched 1 billion [9]. The everyday traction can touch the US\$ 5 billion mark by the end of 2025 for about 300 mobile wallet service providers working in 95 countries [9]. Digitalization of economies is the call of the future. In Indonesia, the growth of E-wallet service providers is quite promising. Bank of Indonesia, in its report, indicated that 48 E-wallet services are legally operated. This is aligned with the number of transactions of E-wallet, where USD 1.5 billion was recorded in 2018, and this number is predicted to be increased in the year 2023. This statistic opens more interest for the researcher to investigate the acceptance to use of E-wallet in Indonesia. Many recent studies by Ref. [10] in Indonesia revealed that most users are in the age group of 20–30 years old (52.3 %), followed by teenagers (33.3 %), and older adults at the bottom of the list (13 %). Studying the intention to use e-wallets among Indonesian adults is necessary to understand adoption factors, identify user preferences, inform marketing strategies, promote financial inclusion, and guide policy and regulatory decisions.

In Indonesia, the penetration of e-commerce among the population increased from 34 % to 53 % in the last five years [9]. Indonesian consumers greatly appreciate adopting the digital economy, and fintech adoption has recently increased. Fintech, or financial technology, is used to augment, streamline, digitize, or disrupt traditional financial services. And to date, many businesses nowadays rely on fintech for payment processing, e-commerce transactions, and accounting. In the wake of the Covid-19 pandemic, more and more companies are turning to fintech to accept contactless payments or adopt other tech-fueled advancements. Although an increasing number of fintech services are available, there are also associated risks, including security concerns. Mobile payment instruments are particularly vulnerable to fraudulent activities. Despite the significant surge in mobile wallet users, the factors that shape people's intention to use E-wallet are still unknown. Indonesia is increasingly becoming a cashless economy as the size of the e-money transaction rose by 173 % from 2020 to 2021 [11]. The four top E-wallet platforms are Go-pay, OVO, DANA, and LinkAja are the top four E-wallet platforms. The e-commerce infrastructure facilitates the growth of E-wallets adoption, and the E-wallet market may touch the 48.3 billion transactions by the end of 2025 [9]. Furthermore, in many developing nations, the e-wallet sector is still in its initial stages, and many communities are hesitant to adopt them. In support of this view, according to scholar [12] E-wallet adoption is still minimal in Indonesia. Increasing the adoption of E-wallet builds a cashless society and facilitates money transactions enabling efficiency and effectiveness in money dealing. Hence, to investigate the intention to use E-wallet in Indonesia, the current study employs a combination of a technology adoption model (TAM) and a unified theory of acceptance and use of technology (UTAUT) enhanced with the perception of new technology, trust, and compatibility. Perceived ease of use refers to the subjective perception of users regarding the simplicity and usability of a technology or system. It represents the extent to which users believe that using the technology or system will be effortless and free from complexity. A higher perceived ease of use indicates that users perceive the technology or system as user-friendly and intuitive, making it easier for them to adopt and utilize it. Perceived risk refers to the perceived uncertainty or potential negative consequences associated with adopting and using a particular technology or system. Risk is unavoidable in many aspects of human life [96]. It encompasses concerns such as financial risks, privacy risks, security risks, and performance risks [97]. Users' perception of risk influences their decision-making process and can act as a barrier to technology adoption. Lower perceived risk indicates a greater sense of confidence and trust in the technology, which increases the likelihood of

adoption. Compatibility refers to the degree of harmony or fit between a technology or system and users' existing beliefs, values, needs, and prior experiences. It assesses whether the technology aligns with users' expectations and integrates seamlessly into their current practices and routines. Higher compatibility suggests that the technology is perceived as compatible with users' needs and fits well into their existing context, facilitating adoption. Perceived trust refers to users' subjective perception of the reliability, credibility, and integrity of a technology or system. It involves the belief that the technology will function as intended, protect users' information and transactions, and fulfill its promises. Trust plays a crucial role in influencing users' intention to adopt and use a technology, as it reduces uncertainty and increases users' confidence in relying on the technology. New technology perception represents users' attitudes and beliefs towards novel or innovative technologies [102]. It captures users' subjective evaluation of the novelty, usefulness, and potential benefits associated with adopting and using a new technology. Users' perception of new technology can influence their adoption intention, as positive perceptions are more likely to foster acceptance and willingness to try out the technology [98]. Next, the relevant literature is briefly presented in the following sections to design the study model and hypothesis. Then, we offer the methodology employed in the present study. The findings were later introduced, along with a discussion and findings. Finally, the paper concludes with a debate on the study's contribution and limitations.

1.1. Research objectives

The research study takes its course of action from key questions that provide bases for formulating objectives that must be investigated and lead us toward viable conclusions [13]. The research objectives aim to investigate various factors that may influence adopting and using E-wallet among Indonesian adults. By examining these factors, the study provides insights that can inform policies and strategies to enhance adopting and using E-wallets in Indonesia. This research formulates of the following nine objectives.

- To investigate the impact of perceived ease of use (PEU) on the intention to use an E-wallet (INT) among Indonesian adults.
- To investigate the impact of perceived ease of use (PEU) on the perceived risk (PR) of using an E-wallet among Indonesian adults.
- To investigate the impact of perceived risk on the adoption of new technology (NT) among Indonesian adults.
- To investigate the impact of new technology (NT) perception on the intention to use an E-wallet (INT) among Indonesian adults.
- To investigate the impact of perceived ease of use (PEU) on compatibility (CO) among Indonesian adults.
- To investigate the impact of compatibility (CO) on perceived trust (PT) among Indonesian adults.
- To investigate the impact of perceived trust on the intention to use an E-wallet among Indonesian adults.
- To investigate the serial mediating effect of perceived risk (PR) and new technology (NT) on the relationship between perceived ease of use (PEU) and the E-wallet use intention (INT) among Indonesian adults.
- To investigate the serial mediating effect of compatibility (CO) and perceived trust (PT) on the relationship between perceived ease of use and the E-wallet use intention (INT) among Indonesian adults.

1.2. Theoretical foundation and research model

The technology acceptance model (TAM) describes why users want to adopt information system technology [14] and how they come to accept and use it [15]. This model is based on the theory of reasoned action (TRA), which explains attitude and desire to perform are determined by social behavior [16], and the theory of planned behavior (TPB). These theories were established respectively by Davis [17] and explain how antecedent variables influence the behavioral intention of technological users [16] and have characteristics that are felt to be useful and are felt to be easy to use. TAM takes a savvy approach to forecast systems that impact information technology intention and behavior [18]. The unified theory of acceptance and use of technology (UTAUT) was proposed to explain the information system behavioral intention and use behavior [19]. TAM theory states that perceived ease of use and perceived usefulness influence users' adoption of information technology [20]. Nevertheless, for better clarity, additional antecedent variables such as perceived risk, perceived trust, compatibility, and perceived new technology can be incorporated [21,22]. Risk perception is key to technology adoption and acceptance [23]. Compatibility is a factor that is integrated into the acceptance and use of technology, and it might assist in explaining why individuals prefer digital transactions [24]. Furthermore, one of the essential elements influencing the use of an e-wallet intention is trust because users with a significant level of trust are more likely to accept this new technological payment [25].

Since the late 1980s, Davis has presented the technology adoption model (TAM), a protuberant theory explaining technology adoption [26]. TAM promotes the intention to use technology by building an attitude based on variables such as simplicity of use and applicability of the technology. Thus, the perception of usefulness and ease of use remains significant in describing the desire to adopt the technology. Venkatesh proposed a unified theory of acceptance and technology use, which extended the TAM and incorporated social impact and facilitating factors as predictors of behavioral intention. Studies [27] postulate that the UTAUT is a better model to explain the behavioral intention for accepting novel technologies. Novel technologies are always regarded as risky, and users are unaware of getting benefits and using the technology appropriately [28]. Money matters need security and secrecy to execute the money-related transaction. E-wallet is highly associated with fraud and lack of user protection, as discussed by scholars [7].

Primarily E-wallet users are dissatisfied with the security features and misuse of user identity in electronic transactions [29]. Compatibility is also necessary to instigate the adoption of new technology, and the compatibility facilitates the users to perceive the new technology much resemble the existing technology in use [21]. New technology perception is investigated because it affects users' attitudes toward new technology. Users are more likely to adopt new technology if they perceive it as useful and easy to use. In the context of e-wallets, users may be more likely to adopt the technology if they perceive it as a convenient and secure alternative to

traditional payment methods. This study adopts TAM theory, considered the most reliable, cost-effective, and widely used model of innovation acceptance [15,23]. Moreover, TAM is one of the most frequently referenced models in the field of technology acceptance, and it has been tested in several contexts [16,22,30]. Thus, this study adopts TAM to evaluate the direct and indirect impact of perceived ease of use on E-wallet usage intention via perceived risk, perceived compatibility, perceived trust, and perceived new technology in Indonesia.

To reiterate, the study adopts the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) to explain the behavioral intention and use behavior of information system technology, specifically e-wallet usage in Indonesia. TAM explains how antecedent variables influence the behavioral intention of technological users and is founded on the theory of reasoned action (TRA) and the theory of planned behavior (TPB). UTAUT extends TAM and incorporates social impact and facilitating factors as predictors of behavioral intention. The study adopts TAM to evaluate the direct and indirect effects of perceived ease of use on E-wallet usage intention via perceived risk, perceived compatibility, perceived trust, and perceived new technology. TAM is chosen because it is considered the most reliable, cost-effective, and widely used model of innovation acceptance and has been tested in various contexts. Fig. 1 depicts the hypothesized and tested relationships in this study. The figure shows there are 13 hypotheses developed for the study. Each of them represents a relationship between independent variables and dependent variables. Other than the direct relationship to be tested, six (06) hypotheses involve mediating variables (H8–H13).

2. Literature review on E-wallet usage intention

The probability that prospective users would engage in a specific action, such as adopting new technology, is referred to as user behavioral intention [31]. This intention is the proxy of the performance of actual behavioral adoption. Individual attitude formed with the availability of multiple technology-related attributes harnesses the exhibition of inclination to use technology like e-wallet [32]. An E-wallet is a smartphone application that allows users to conduct various mobile financial transactions [22]. In today’s technology culture, E-payment is one of the most significant components of E-commerce because it helps to improve user efficacy and expand the possibility of using mobile payment [18]. E-wallet systems payment is very convenient and transparent, allowing users to make payments anytime and anywhere [33]. User behavioral intention refers to the likelihood that potential users will do a particular activity, such as adopting new technology [19]. This intention is the proxy of the performance of actual behavioral adoption.

2.1. Factors affecting E-wallet intention of usage

2.1.1. Perceived ease of use (PEU) and intention to use an E-wallet (INT)

New technology mostly comes with usefulness but often builds the difficulty of using the latest technology. Perceived ease of use indicates that the technology is simple to use and decreases the effort required by users to execute the activity [26]. The justification is

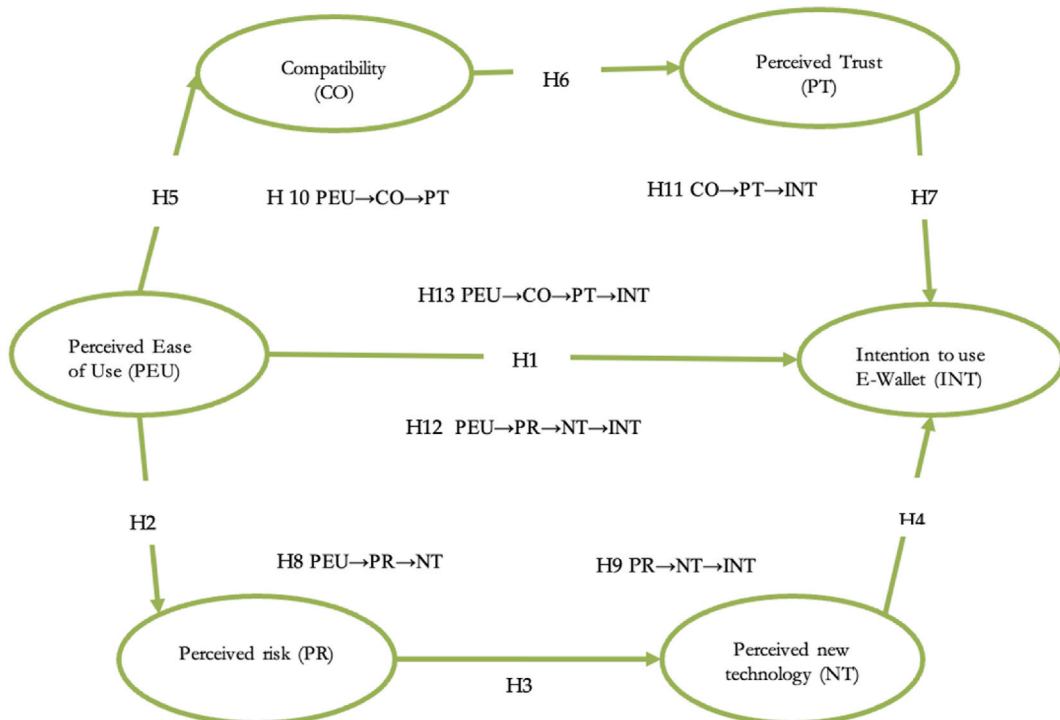


Fig. 1. Research model.

that the new technology makes users more comfortable and encourages them to use it [34]. Singh and Srivastava [1] posit that ease of use strongly predicts intention to adopt mobile banking. Nguyen and Huynh [35] empirically confirmed that ease of use impacts the intention to adopt e-payment. Perception of ease from using the technology varies among the samples based on the cultures and existing accepted technology or practices [36]. Perceived Ease of Use refers to “the degree to which a person believes that using a technology will be free from effort” [14]. The perceived ease of use is one of the most significant factors in user attitude and behavioral intention to adopt and use technology [15]. Users will be more willing to learn about E-wallet and eventually wish to use them if it is relatively simple [20]. Several studies have shown that perceived ease of use significantly impacts behavioral intention [37–39]. Therefore, it is necessary to evaluate the impact of E-wallet on ease of use among the Indonesian sample. Thus, this study formulated the following proposes hypothesis (H1): Perceived Ease of Use (PEU) has a positive effect on the intention to use E-wallet among adults in Indonesia.

2.1.2. *Perceived ease of use (PEU) and perceived risk (PR)*

The psychological belief of suffering a loss in pursuit of a desirable objective is characterized as perceived risk [30]. Risk perception is a critical factor in technology adoption and acceptance, as users tend to avoid technology that they perceive as risky. Reduced perceived risk can significantly impact intentions to use an E-wallet payment, as attitudes and perceived ease of use often lead to actions [40]. In addition, the less effort necessary to operate a technology, the more likely it is that regular usage of the system will result in an increase in work performance [14]. Furthermore, with more simplicity in operating a system, there is less risk, which could lead to E-wallet purpose and behavior. Perceived risk and trust are important antecedents in consumer decision-making, according to Hansen et al. [41], and risk-taking propensity directly affects behavioral intention [38]. Thus, we propose hypothesis (H2): Perceived Ease of Use (PEU) has a positive effect on the Perceived Risk (PR) of using E-wallet among adults in Indonesia.

2.1.3. *Perceived risk and perceived new technology*

Perceived risk is essential in technology adoption and acceptance [23]. It can be understood as a metric that measures customer apprehension about the potential negative consequences of adopting new technology [18]. The elements of perceived risk can be found in online transactions, services, or products. Risk is a major factor in employing this new technology in the context of a mobile wallet and may bring negative impacts [25]. Even though perceived risk is a complex concept involving multiple types of risk [42], the literature has identified perceived risk as a major factor in technological adoption [23,43]. Based on TAM model in the online commerce channel, perceived risk is considered as an important antecedent variable [16,41]. We suggest hypothesis (H3): Perceived risk has a positive effect on new technology to use E-wallet among adults in Indonesia.

2.1.4. *Perceived of new technology and intention to use E-wallet*

Individuals have different perceptions of innovative technologies and the innate personal willingness to try and engage in new innovative technology like E-wallet [44]. E-wallet is an upcoming innovative technology and likely to be adopted by the masses around the globe. Farmers' intentions and acceptance of novel technologies, such as traditional agriculture techniques, in Pakistan are facilitated by their affinity towards technology [45]. Liébana-Cabanillas, Ramos de Luna, and Montoro-Ríos [44] have suggested that personal innovativeness significantly predicts the intention to use QR code as a novel technology for mobile payment. E-wallet emerging in the digital payment environment provide businesses and customers with several options to adopt these new technologies, which are believed to be more beneficial than traditional methods [22]. According to TAM theory, user intentions are formed based on the belief that employing a certain or new technology will improve their job performance and raise the chance of individual intention [16]. Users can utilize new technology instruments to achieve their personal and governmental goals [46]. Thus, perceived new technology is predicted to influence e-wallet usage intention. We suggest the following hypothesis (H4): Perception of new technology has a positive impact on the E-wallet usage intention among adults in Indonesia.

2.1.5. *Perceived ease of use (PEU) and compatibility (CO)*

Compatibility relates to the degree to which users' views, habits, beliefs, needs, or previous experiences are congruent with the innovation [22]. Compatibility plays an essential role in the acceptance of new technology. If a new technology is perceived as compatible with the user's current systems and processes, they are likelier to adopt it. In the context of e-wallets, compatibility refers to the extent to which the technology is compatible with the user's existing payment habits and systems. Compatibility testing is critical to the success of E-wallet services, as the services must conform to the users' ideas and beliefs to be successfully adopted [30]. Users will have less difficulty learning new technology if it is more compatible with their experience and lifestyle [21]. Thus, perceived ease of use can influence compatibility since the simpler the technology, the more efficient and compatible it could be. According to Ref. [47], perceived similarity has a crucial outcome on the purpose of using E-Marketing through attitude toward adopting E-Marketing. Furthermore, compatibility is the most important aspect in defining and shaping perceived ease of usage [21]. Therefore, perceived ease of use can have a useful impact and benefits on compatibility by proposing hypothesis (H5): Perceived Ease of Use positively affects the Compatibility to use of E-wallet among adults in Indonesia.

2.1.6. *Compatibility (CO) and perceived trust (PT)*

When it comes to adopting new technology such as E-wallet, compatibility is crucial [21]. Compatibility is critical for the proliferation of new technologies since it lowers the danger of misusing them [15] and increases user trust. When users believe a product to be compatible, they may trust it, and it may be practical for their basic needs [48]. High compatibility could lead to trust, increasing the chance of adopting technology-related applications [30]. Previous studies indicated that perceived ease of use, lifestyle

compatibility, and perceived trust has a significant positive impact on both e-wallet usage intentions and adoption [22,48,49]. Perceived trust is a crucial factor in adopting new technological payment methods, such as e-wallets, as users with a high level of trust are more likely to accept the technology. Therefore, this study propose hypothesis (H6): Compatibility (CO) has a positive impact on Perceived trust (PT) to use E-wallet among adults in Indonesia.

2.1.7. *Perceived trust and intention to use e-wallet (INT)*

Perceived trust depicts the individual understanding that the services offered are secure and have no privacy issues for the users [50]. Perception of trust significantly influences the consumer's positive attitude towards adopting new technologies [51]. Perceived trust is crucial because it affects the user's willingness to adopt new technology. Users are more likely to adopt new technology if they perceive it as trustworthy. In the context of e-wallets, users may be concerned about the security of their personal and financial information, and they may need to trust the technology provider and payment intermediaries. Consumers' confidentiality and security for online payment are crucial for a positive attitude toward using E-payment services [52]. Consumers are generally considered susceptible as the consumer's personal information and monetary details may be exposed to other users for a service provider while making payments and delivering services [50]. [51] establish that trust in E-wallet builds the intention to use e-banking among Indian banking consumers. In the mobile wallet context, trust refers to how confident consumers are that the service will improve efficiency, performance, and profits [15]. Considering the possibility of being hacked, trust is significantly more important for payment via mobile wallets. User's privacy and security when making electronic payments are critical factors in developing a positive attitude about using e-payment systems [52]. Consumers are often vulnerable since their personal information and financial details may be accessible to other users for a service provider while making payments and delivering services [53]. Since the nature of the transactions is personal, sensitive, and confidential, perceived trust is crucial [15]. Moreover, since a high level of trust leads to greater user acceptance of the e-wallet usage intention, it is regarded as one of the most significant antecedents influencing the decision to use an e-wallet [25]. Therefore, this present study suggests hypothesis (H7): Perceived trust has a significant positive effect on the intention to use E-wallet among adults in Indonesia.

2.2. *Literature review of mediating variables*

Having assessed the direct effect of the independent variables on the purpose of using an E-wallet, this study is based on [54] four rules of thumb for mediation analysis to determine the indirect effect of the mediating variables. Thus, the mediating or indirect outcome of perceived risk, compatibility, perceived trust, and perceived new technology on the intention to use an E-wallet.

2.2.1. *Perceive risk mediate perceived ease of use and new technology*

Perception of risk promotes susceptibility among the users of new technology [35]. Adopting innovation or new technologies is risky and causes the perception of vulnerability among the users [53]. The perceived risk in the E-wallet is termed as the provision of sufficient security and privacy for the users to execute the transactions [51]. The susceptibility of E-wallet is based on the internal malfunctioning of the system and errors related to the system execution making the final transaction as initiated by the users [53]. The term perceived risk is a key factor that customers will consider in deciding to adopt or use any technological device, especially for financial transactions. This may discourage people from using a new technology once they perceived risk involvement is high [42]. Although the risk is inevitable in any decision or action taken, the customer and business operator should balance the risk with the opportunity to optimize profit and performance (Zainuddin et al., 2022b). This study believes that customers will be more willing to use the E-wallet for easier and faster business transactions, which can only be achieved when the perception of risk is less. In other words, when people perceive a high level of risk, they are less likely to utilize an e-wallet.

Some previous studies have revealed that financial transactions involving online entail some risk and perceived risk and can be viewed from various perspectives. Thus, perceived risk may constitute the risks of performance, financial, time/convenience, and psychological [42,55]. In line with [54] concept of mediation, where the mediating variable is assumed to have an influence on the predictor and outcome variables. Thus, a perceived high risk can unpleasantly affect people's intention to patronize the use of E-wallet [56]. Similarly, perceived insignificant risk will play an important role in building perceptions towards the ease of use and desire to use e-wallets in relation to other studies [37,57]. Risk perception is among the most crucial variables in defining one's willingness to accept mobile payments [25]. Providing sufficient safety and privacy for users to complete transactions is referred to as the perceived risk in the E-wallet [15]. Customers will assess perceived risk when deciding whether or not to embrace any technology tools, particularly for financial transactions. This may deter consumers from using new technology if they believe the risk is great [42]. Users are more willing to utilize and be driven to mobile payment if they perceive it is safe, reliable, and less risky to use daily. When the supposed risk is substantial, users will use more traditional channels than an e-wallet [21]. If risk perception is low, users will be more motivated to use an e-wallet for more accessible and efficient business transactions [37]. Thus, their perception of risk may be mediated by perceived ease usage on individual purpose to be familiar with E-wallet. This study anticipates that perceived risk will mediate the perceived ease of use and intention to use E-wallet. Thus, this study has the hypothesis (H8): Perceived risk has a significant mediating effect on perceived ease of use and new technology.

2.2.2. *Perceived new technology mediates perceived risk and the intention to use E-wallet*

Electronic or E-wallet being an alternate form of traditional financial transaction, consumers will not only consider perceived risk in using the online transaction or switching to implementing an E-wallet as per this current study. Because the technology is new with less assumed risk, customers will be willing to adopt it once it meets an urgent need, like online financial transactions via E-wallet at

any convenient time [11]. Though other studies revealed that a high likelihood of risk involved in using a new technology might cause a decline in the adoption of the use of an online facility, other recent studies suggest that perceived risk may not hinder people from using e-wallet once the system or technology is new and is meeting their needs [11,58]. Thus, perceived new technology, along with low perceived risk, will show an important mediating part in inducing customers' aim and purpose to use E-wallet [11,59]. Hence, this study measured the mediating role of perceived new technology in the presence of perceived risk and the intended purpose of utilizing an E-wallet. When new technologies are comfortable with consumers' experiences and lifestyles, they are more likely to adopt them [21]. Users are more likely to accept a new technological application if they believe it is beneficial, convenient, and less risky for daily activities [48]. Technology is a type of risk (Zainuddin et al., 2022c). However, since the technology is new and it has not shown any negative implications, it is perceived to have a lower risk. Hence, individuals will be eager to embrace it, especially if it meets an immediate demand, such as online financial transactions via e-wallet [11]. As a result, customers' purposes of getting familiar with an e-wallet will be swayed by their awareness of new technology combined with low perceived risk. Thus, perceived new technology is expected to mediate the relationship between perceived risk and the intention to use the E-wallet with the hypothesis (H9): Perceived new technology has a significant mediating effect on perceived risk and the intention to use E-wallet.

2.2.3. *Compatibility mediates relationships between perceived ease of use and perceived trust*

According to recent research, compatibility is a key concern when deciding whether or not to get used to E-wallet, and it has a strong mediation outcome of perceived ease of use and the decision to use an e-wallet [60]. Compatibility is generated when people can make even their aspirations with technology or when the technology can fulfill their lifestyle and needs [15]. This contributes to developing a good attitude toward technology, which promotes the desire to adopt it. Users regard technology services such as e-wallets as essential and expect them to be compatible and simple to use [22]. As users of any electronic payment system become more compatible, the perceived ease of using an e-wallet will increase [48,61]. Thus, the study proposes to assess the mediating influence of compatibility on the link between perceived ease of use and intention to use an E-wallet.

Compatibility relates perception that new technology is closely associated with the old technology or practice [62]. The similarities and resemblance of new technology with the technology in use simplify the users to use the latest technology [63] effortlessly. Consumers' perception that new technology matches the consumers' existing values, needs, and attitudes facilitates new technology adoption [64]. The perception of technology compatibility influences the intention to adopt novel technologies [63]. Compatibility promotes the perception that the new technology is similar to the existing technology or practice and promotes the intention to use some technology [64]. Compatibility plays a vital role in terms of the information system and the use of mobile communication systems. As users of any electronic payment system to be compatible, the higher it will affect the perceived ease of use and the overall intention to use the mobile payment system or e-wallet [61,65,66]. Recent studies show compatibility is an important consideration concerning the intention to use an E-wallet. It mediates the relationship between perceived ease of use and the intention to use an E-wallet [67]. The technology acceptance model (TAM) application in mobile communication or payment systems indicates that compatibility constitutes a prime variable in any mobile payment system using an E-wallet [65]. This extant study predicts compatibility to facilitate the correlation between perceived ease of use and intention to use an E-wallet and propose hypothesis (H10): Compatibility has a mediating effect on the relationship between perceived ease of use and perceived trust.

2.2.4. *Perceived trust mediate relationships between compatibility and the intention to use E-wallet*

One of the most essential aspects of embracing any technological advancements is for creators to ensure that service users can trust their endeavors first. Users who rely on a service provider, such as using an e-wallet for online transactions, will have a strong sense of loyalty and connection [49]. Users with a low level of trust in their mobile wallet may regard it as less compatible and hence be less likely to use it [22]. Thus, technology providers should strive to provide distinctive ways to develop trust, confidence, and compatibility to meet consumers' diverse requirements and aspirations [61,68]. Prior research has suggested that perceived trust is significant in assessing the link between compatibility and the desire to use a mobile or e-wallet [39]. In adopting any technological innovations, it is essential for developers to ensure that customers can first trust their initiatives. This is a determining factor in creating and providing a continuous link with customers [22]. Once customers trust a service provider, for that matter, the use of an E-wallet for the online payment system, there will be a high sense of feeling from loyal customers and referrals [49]. This can be assured if the technology providers continue to deliver in unique ways that seek to build trust and confidence in meeting customers' varied needs and expectations [61,68]. This intertwines compatibility and trust and influences the intention to use an E-wallet. In terms of the mediating effect of perceived trust between compatibility and the intention to use an E-wallet, some related prior studies alluded that perceived trust plays a vital part in explaining the connection between similarity and the purpose of using mobile or e-wallet [22,69–71]. Because of this, and with trust mediating compatibility, there will be high facilitating adoption usage behavior of E-wallet. This study, therefore, posited hypothesis (H11): Perceived trust positively mediates the relationships between compatibility and the intention to use an E-wallet.

2.2.5. *Perceived risk (PR) and new technology (NT) as serial mediation the relationship between perceived ease of use and the intention to use an E-wallet*

Perceived risk relates to how concerned a user is about the unknowns and negative impacts of using an online application service such as new technology [42]. Users tend to embrace an internet transaction if the operation/process is easy to use, which can aid in adopting new technologies and benefit the user by lowering transfer costs and risks and boosting work performance [40]. Users are more willing to accept new technologies if they are familiar with their attitudes and behaviors and are viewed as less dangerous [21]. Users are more motivated to adopt a new technological application if they perceive it would make their daily lives more accessible,

comfortable, and less risky [48]. The literature has demonstrated a strong link between perceived risk and intention to use online transactions [37,38]. Thus, this study established hypothesis (H12): Perceived risk and new technology mediate the relationship between perceived ease of use and the intention to use an E-wallet.

2.2.6. Compatibility (CO) and perceived trust (PT) as serial mediation on the relationship between perceived ease of use and the intention to use an E-wallet

The easier accessibility and compatibility of mobile payment can increase the perceived trust of the customer, which leads to the intention to adopt and use [21]. Perceived compatibility contributes to a technology's user satisfaction, perceived ease of use, and behavioral desire to embrace it [22]. It is reasonable to assume that if a digital platform is simple to use and compatible, users will increase trust and confidence in it [15]. Consumers may appreciate E-wallet as a useful tool since it is easier to use, understand, reliable, and compatible with their lifestyle and previous experiences [21]. Thus, compatibility and perceived trust are critical factors in E-wallet acceptance. Previous studies have shown that perceived trust and compatibility can influence the purpose of using online transactions [22,43,72]. Thus, this study aims to determine the mediating role of compatibility and perceived trust in the relationship between perceived ease of use and intention to use an E-wallet and to explore hypothesis (H13): Compatibility and Perceived trust mediate the relationship between perceived ease of use and the intention to use an E-wallet.

3. Research methods

To achieve the aims of this study, a quantitative survey design using an online questionnaire was employed. The questionnaire was then translated into Indonesian language by a professional translator. The survey dissemination was preceded by obtaining approval from the Research and Ethics Unit of Universiti Malaysia Kelantan. Nevertheless, the research unit reached a consensus that human subjects were not involved in the experiment. The data collected solely relied on their perspectives, therefore rendering an in-depth examination of ethics unnecessary for this study. Furthermore, within the context of the questionnaire survey, it is imperative to adhere to the guidance provided by the ethics unit. The researcher explicitly communicates that participation in the survey is voluntary, and respondents have the option to withdraw if they do not agree with the statements presented in the questionnaire. In other words, data obtained from this survey already agreed by all participants for the use of the research. Moreover, it is explicitly mentioned that the data will be handled with confidentiality and primarily utilized for the purpose of this research, ensuring that it will not be disclosed to any external entities.

This research can support the sustainable growth and development of the e-wallet industry in Indonesia while ensuring that the needs and interests of Indonesian adults are adequately addressed. Online surveys are designed using Google's forms platform. The data collection took place for three months, from 01 March to May 31, 2022. The survey link is distributed among 800 participants using social media platforms such as Facebook to reach users in Indonesia who have used an account at least once an E-wallet to perform any transaction. The study received 400 completed questionnaire with the response rate of 50 %, later on 16 questionnaires were found incomplete and removed and the final analysis was done using 384 responses.

3.1. Survey measures

The items in the survey were assumed from the earlier validated and confirmed instruments. Perceived usefulness adopted from Lwoga and Lwoga [52] work, having five items. Perceived ease of usage for the E-wallet was measured with six items and items adopted from the work of Karjaluoto, Shaikh, Leppäniemi, and Luomala [5,51]. Social influence was assessed with the five items taken from Refs. [52,73]. E-wallet facilitating conditions were measured with the five items adapted from the work of [73]. The compatibility of the E-wallet was assessed with five items taken from Refs. [51,52]. The Perceived trust was evaluated with six items adapted from Refs. [51,74]. Intention to apply the use of an E-wallet measured with six items, the items adopted from the work of [74,75]. Lastly, personal innovativeness related to information technology was adopted from Agarwal and Prasad [76] and Lu et al. [77].

3.2. Assessment of common method variance

Harman's (1976) one-factor test was utilized to estimate the issue of common method variance [78]. Results of the one-factor Harman's test approve that CMV is not a severe matter to study as the uppermost factor account for 37.40 % variance and less than the suggested limit of 50 % [78].

3.3. Multivariate normality

It is unnecessary for non-parametric analysis tools such as SEM-PLS 4.0 to exhibit multivariate normality in the data [79]. However, data with multivariate normality tested using Peng and Lai [80] commendation, a web-powered online tool (<https://webpower.psychstat.org/wiki/tools/index>), is used to establish the normality of the data. The results prove that the data is not as normal as the multivariate figure of Mardia's p-values coefficient, which is less than 0.05 [81].

3.4. Data analysis method

Partial least squares structural equation modeling (PLS-SEM) was exploited with Smart-PLS 4.0 software for the analysis of study

data. PLS-SEM is a multivariate analysis tool that assesses latent construction study path models [79]. PLS-SEM allows researchers to deal with abnormal and small data sets. Moreover, the common predictive nature of the benefits of PLS-SEM works with models with a certain level of complexity that are composite and functional minus the assumption on benefit-suitability, estimated from covariance-based SEM [82]. Moreover, using a two-step analysis scheme in this study for data analysis in PLS-SEM 4.0 has been suggested. At the preliminary stage, measurements were achieved on the model to see the validity and reliability [79]. The next stage achieves the association of structural models and studies the hypotheses with a level of significance [83]. Model estimates with r^2 , Q^2 , and effect size f^2 describe path effects from exogenous constructs to endogenous constructs [79]. Importance performance map analysis (IPMA) states the constructs in the present study as relatively high to low in terms of importance and presentation for endogenous constructs [83]. IPMA supports recognizing areas of potential improvement that require reflection from policymakers and researchers.

The IPMA analysis profiled the total effect of the scaled variable scores in a non-standard procedure [84]. A re-scaling was developed for each latent variable score between 0 and 100. The mean value of the latent variable score indicates the performance of the latent variable, where 0 represents the least, and 100 represents the most significant in endogenous construct performance [79]. PLS prediction was recommended by Shmueli et al. [85] to confirm the critical endogenous constructs of the model and check for prediction errors. Predictive performance was assessed with the Q^2 predict statistical mean for validation with a naive measuring stick designed by the PLS predict method [85]. PLS predict estimates naive benchmarks in a linear regression (LM) model. A comparison between the RMSE or MAE values for the LM and PLS models confirms the explanatory power of both methods [86]. suggested that the PLS-SEM model has no predictive power if the PLS-SEM model produces a higher prediction error than the LM benchmark. If most PLS-SEM 4.0 analyses produce higher prediction errors than the LM benchmark, it illustrates the low predictive power of the PLS-SEM model. If only a small fraction of the PLS-SEM analysis produces a prediction error higher than the LM benchmark, it indicates the moderate power of the PLS-SEM model. If there is no indicator in the PLS-SEM model with more mistakes than the LM benchmark, the PLS-SEM model has a higher predictive power [86].

4. Missing data and outliers assessment

In summary, Table 1 presents the details of data collection response rate, screening, missing values, and outliers. Initially, the researcher distributed 800 online survey questionnaires among Indonesian adults. In response, 400 questionnaires were returned, indicating a 50 % response rate considered sufficient in online survey for the generalization of results. Besides, normality tests confirmed that 16 cases have normality issues. Thus, after removing 16 cases that are not useable the cleaned data of 384 was used for further SEM analysis (78). The details of data collection, response rate and outlier cases management are highlighted below.

5. Data analysis

5.1. Demographic characteristics

For the current study, data collected from young and educated Indonesians are female, with 72.2 % of the total respondents. Most of the study respondents were between 24 and 27 years of age, with 36.9 % of the total respondents. Respondents 28–31 years of age are 10.5 %, and 36.4 % of the respondents have aged less than 24 years of age. Only 6.2 % have respondents have aged between 32 and 35 years of age. 3.4 % of the study respondents are between 36 and 39 years; 6.6 % of the respondents have an age above 40 years. 62 % of the respondents use the E-wallet daily. The respondents using the E-wallet monthly 1–5 times were 45 %, using 6–10 times monthly were 31 %, respondents using the E-wallet more than ten times in a month were 19.5 %, and the remaining were not using the E-wallets. The details of demographic characteristics are highlighted in Table 2.

5.2. Measurement model

Using validation [79], we achieved and documented the results of Smart PLS. The reliability of the study constructs was evaluated with items loading, Composite Reliability (CR) and average variance extracted (AVE) for each construct. The results showed that all study constructs had acceptable reliability values, and the lowest scores were 0.760, 0.751, and 0.849, respectively. For all constructs items loading and CR above the 0.70 benchmarks [79]. The extracted mean value (AVE) for each construct must exceed a score of 0.50 to establish convergence validity as an indicator of the single order reflective constructs [79].

The study items indicate that the construct has reasonable convergence validity (see Table 3). Next to validate discriminatory

Table 1
Response rate and data cleaning summary.

Survey Method	Questionnaires	Quantity	P %
Total Distributed Questionnaire online-Survey	Number	800	100 %
	Returned	400	50 %
	unreturned	400	50 %
Unusable missing Cases and Outliers Removed Clean Data 384 Out of 400 Used for (SEM) Analysis		16	4 %
		384	96 %

Table 2
Demographic characteristics.

Demographic Variables	N	%		N	%
Gender			Using E-wallet Daily		
Male	107	27.8	Yes	235	62.0
Female	277	72.2	No	149	38.0
Total	384	100.0	Total	384	100
Age Group			Monthly use		
Below 24 years	140	36.4	1-5 Times	173	45.0
24–27 years	142	36.9	6-10 times	119	31.0
28–31 years	40	10.5	10 plus times	75	19.5
32–35 years	24	6.2	Never	17	4.5
36–39 years	13	3.4	Total	384	100
40& above	25	6.6			
Total	384	100			

validity for each construct three criteria were used.g., fornell-larcker criterion, cross loadings and heterotrait-monotrait ratio (HTMT) to justify the validity of construct discrimination [87]. The result of the fornell-larcker criterion the diagonal should be greater than the inter-construct correlation value below and above for each construct (see Table 4) [79]. The HTMT ratio was essentially less than 0.900 to provide evidence for the validity of discrimination for the study construct [88]. In the cross loading Table 5, the items loading for each construct should load higher than other. The fornell-larcker criterion is a well-established method for assessing the discriminant validity of latent variables in CB-SEM models. It involves comparing the square root of the AVE of each latent variable with the correlation coefficients between variables in the model [10]. If the square root of the AVE is greater than the highest correlation coefficient, then the variable is said to have discriminant validity. However, PLS-SEM models have different requirements for assessing discriminant validity. One widely used method in PLS-SEM is the HTMT ratio of correlations, which compares the correlation between two constructs to the correlations of each construct with all other constructs in the model. If the HTMT ratio is less than a certain threshold (usually 0.9), then discriminant validity is assumed to be present [95]. Details values of each construct for HTMT are highlighted in Table 6. Fig. 2 displays the measurement model for the present study.

5.3. Structural model assessment

After the measurement model has been assessed by using CV and DV, subsequently structural model validation is also vital. The process entails six key steps: (1) collinearity assessment, (2) path coefficient (β) indicating the strength of the relationships between constructs, (3) a percentage of variance explained or R square (R2), which is traditionally called regression score, (4) assessment of

Table 3
Convergent validity.

Variables	Items loading	Composite Reliability (CR)	Average Variance Extracted (AVE)
Compatibility (CO)	CO1 0.844	0.927	0.719
	CO2 0.906		
	CO3 0.865		
	CO4 0.776		
	CO5 0.842		
Intention to use E-Wallet (INT)	INT1 0.780	0.914	0.679
	INT3 0.778		
	INT4 0.882		
	INT5 0.856		
	INT6 0.820		
	INT6 0.820		
Perceived Ease of Use (PEU)	PEU1 0.850	0.943	0.769
	PEU2 0.872		
	PEU3 0.869		
	PEU4 0.893		
	PEU5 0.899		
Perceived new technology (NT)	PNT1 0.819	0.867	0.685
	PNT2 0.837		
	PNT4 0.827		
	PNT4 0.827		
Perceived trust (PT)	PT1 0.860	0.939	0.721
	PT2 0.871		
	PT3 0.845		
	PT4 0.866		
	PT5 0.802		
	PT6 0.848		
Perceived risk (PR)	PR1 0.835	0.914	0.780
	PR2 0.929		
	PR4 0.882		
	PR4 0.882		

Table 4
Fornell-larcker criterion.

Variables	Compatibility (CO)	Intention to use E-Wallet (INT)	Perceived Ease of Use (PEU)	Perceived new technology (NT)	Perceived trust (PT)	Perceived risk (PR)
Compatibility (CO)	0.848					
Intention to use E-Wallet (INT)	0.674	0.824				
Perceived Ease of Use (PEU)	0.519	0.517	0.877			
Perceived new technology (NT)	0.477	0.537	0.436	0.828		
Perceived trust (PT)	0.561	0.672	0.483	0.487	0.849	
Perceived risk (PR)	0.328	0.338	0.192	0.312	0.471	0.883

Table 5
Cross loadings.

Items	Compatibility (CO)	Intention to use E-Wallet (INT)	Perceived Ease of Use (PEU)	Perceived new technology (NT)	Perceived trust (PT)	Perceived risk (PR)
CO1	0.844	0.584	0.422	0.409	0.475	0.245
CO2	0.906	0.589	0.439	0.386	0.498	0.305
CO3	0.865	0.588	0.474	0.437	0.480	0.285
CO4	0.776	0.529	0.380	0.367	0.437	0.241
CO5	0.842	0.563	0.476	0.419	0.485	0.309
INT1	0.579	0.780	0.519	0.466	0.624	0.294
INT3	0.474	0.778	0.405	0.371	0.508	0.239
INT4	0.533	0.882	0.402	0.475	0.560	0.304
INT5	0.594	0.856	0.382	0.443	0.545	0.280
INT6	0.584	0.820	0.400	0.443	0.510	0.270
PEU1	0.409	0.420	0.850	0.353	0.389	0.091
PEU2	0.463	0.474	0.872	0.365	0.456	0.191
PEU3	0.463	0.460	0.869	0.371	0.449	0.195
PEU4	0.464	0.427	0.893	0.372	0.369	0.161
PEU5	0.470	0.478	0.899	0.448	0.449	0.194
PNT1	0.393	0.485	0.376	0.819	0.390	0.210
PNT2	0.447	0.424	0.321	0.837	0.415	0.304
PNT4	0.341	0.422	0.387	0.827	0.404	0.260
PR1	0.244	0.267	0.161	0.269	0.355	0.835
PR2	0.304	0.308	0.179	0.286	0.435	0.929
PR3	0.319	0.320	0.168	0.270	0.456	0.882
PT1	0.486	0.582	0.389	0.402	0.860	0.442
PT2	0.508	0.606	0.512	0.450	0.871	0.375
PT3	0.448	0.533	0.352	0.402	0.845	0.425
PT4	0.509	0.564	0.386	0.390	0.866	0.414
PT5	0.434	0.518	0.419	0.417	0.802	0.360
PT6	0.467	0.611	0.397	0.419	0.848	0.382

Table 6
Heterotrait-monotrait ratio (HTMT).

	Compatibility (CO)	Intention to use E-Wallet (INT)	Perceived Ease of Use (PEU)	Perceived new technology (NT)	Perceived trust (PT)	Perceived risk (PR)
Compatibility (CO)						
Intention to use E-Wallet (INT)	0.753					
Perceived Ease of Use (PEU)	0.566	0.566				
Perceived new technology (NT)	0.571	0.647	0.516			
Perceived trust (PT)	0.614	0.738	0.521	0.578		
Perceived risk (PR)	0.372	0.387	0.213	0.384	0.529	

effect size f^2 , (5) predictive relevance Q^2 and (6) q^2 effect size.

5.3.1. *Collinearity assessment*

Variance inflation factor (VIF) values were used to assess multicollinearity using Smart PLS output. The VIF value is much higher

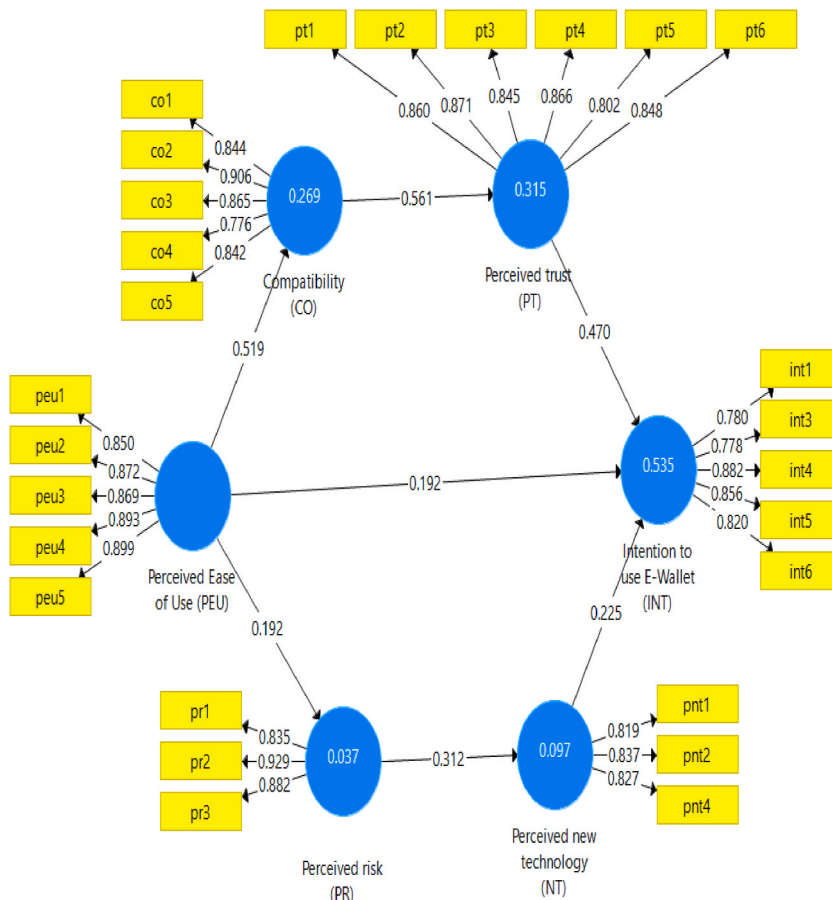


Fig. 2. Adjusted measurement model.

than the 5.0 or 3.3 show signs of a significant level of collinearity. The inflation factor of variance (VIF) for each construct. Table 7 presents all variables' VIF values in the necessary range, subsequently confirming no collinearity issue existed in the model.

5.3.2. Direct effects

Consequently, the study model measurement was studied after realizing the study's model validity and reliability. The objective of the present study is to evaluate the effect of the perceived ease of use, perceived risk, compatibility, perceived trust, and perceived new technology on the intention to use an E-wallet. Based on the direct effects of Table 8, the path coefficient for perceived ease of use ($\beta = 0.192, p = 0.000$), perceived new technology ($\beta = 0.225, p = 0.000$), and perceived trust ($\beta = 0.470, p = 0.000$) indicated a positive and significant effect on the intention to use E-wallet, supporting H1, H4, and H7 respectively. Similarly, the path value for perceived ease of use on perceived risk ($\beta = 0.192, p = 0.000$) showed a positive and significant effect of perceived ease of use on perceived risk, supporting H2. In the same way, the path coefficient for perceived risk on perceived new technology ($\beta = 0.312, p = 0.000$) revealed a significant and positive influence on perceived new technology, supporting H3. Also, the effect of perceived ease of use on

Table 7
Collinearity assessment.

Variables	Compatibility (CO)	Intention to use E-Wallet (INT)	Perceived Ease of Use (PEU)	Perceived new technology (NT)	Perceived trust (PT)	Perceived risk (PR)
Compatibility (CO)	–	–	–	–	1.000	–
Intention to use E-Wallet (INT)	–	–	–	–	–	–
Perceived Ease of Use (PEU)	1.000	1.402	–	–	–	1.000
Perceived new technology (NT)	–	1.408	–	–	–	–
Perceived trust (PT)	–	1.487	–	–	–	–
Perceived risk (PR)	–	–	–	1.000	–	–

Table 8
Direct effects.

S-NO	Hypotheses	Direct β	T-value	P-value	Decision
H1	PEU→INT	0.192	3.620	0.000	Supported
H2	PEU→PR	0.192	3.512	0.000	Supported
H3	PR→NT	0.312	5.924	0.000	Supported
H4	NT→INT	0.225	5.183	0.000	Supported
H5	PEU→CO	0.519	11.705	0.000	Supported
H6	CO→PT	0.561	12.100	0.000	Supported
H7	PT→INT	0.470	10.879	0.000	Supported

Source: The author’s analysis of data

compatibility ($\beta = 0.519, p = 0.000$) indicated a positive and significant impact of perceived ease of use on compatibility, supporting H5. The effect of compatibility on perceived trust ($\beta = 0.561, p = 0.000$) illustrated a positive and significant impact of compatibility on perceived trust, supporting H6. The study’s path coefficients are presented in Table 8 and Fig. 3.

5.3.3. Indirect effects

Table 9 presents the indirect and serial mediation effects in current study. The hypothesis H8 confirmed the mediating effects of perceived risk on the relationship between perceived ease of use and new technology with ($\beta = 0.060, p = 0.013$). The structural model results also supported that perceived new technology also mediates the relationship between perceived risk and intention to use an E-wallet in Indonesia. Similarly, in the presence of perceived new technology, perceived risk considerably and positively affects the intention to use E-wallet, with ($\beta = 0.070, p = 0.000$), thus, supporting H9. In addition, in the presence of compatibility as mediator, perceived ease of use positively affects perceived trust, with ($\beta = 0.291, p = 0.000$), supporting H10. Likewise, perceived trust and compatibility have a significant and positive outcome on the intention to apply E-wallet usage, with ($\beta = 0.263, p = 0.000$) supporting H11. As a result, perceived trust mediates the relationship between compatibility and intention to use an E-wallet in Indonesia.

Moreover, in the serial mediation analysis perceived risk and new technology serially mediate the relationship between perceived ease of use and the intention to use an E-wallet. the indirect path (PEU→PR→NT→INT) was positively significant with ($\beta = 0.013, p = 0.018$),confirming role of perceived risk and perceived new technology as a serial mediator, supporting H12. Similarly, the indirect effect of perceived ease of use with mediation path (PEU→CO→PT→INT) on E-wallet use intention was significantly positive with ($\beta = 0.137, p = 0.000$), indicating that compatibility and perceived trust serially mediate the relationship between E-wallet use intention and perceived ease of use, supporting H13 (See Fig. 3 and Table 9).

5.4. Importance performance matrix

IPMA compares the total effect (importance) and the values of the latent variable scores (performance) of endogenous constructs to highlight areas for improving management activities [79]. Refer to Table 10, the finding of the IPMA showed that perceived ease of use

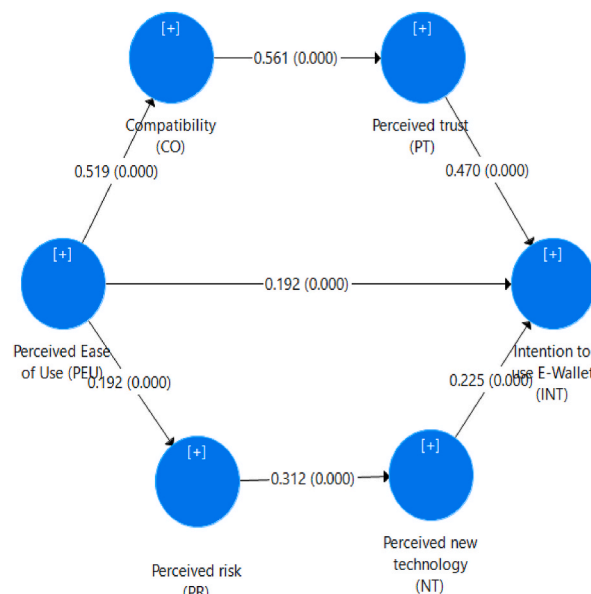


Fig. 3. Structural model.

Table 9
Indirect effects and serial mediation.

S-NO	Hypotheses	Indirect β	T-value	P-value	Decision
H8	PEU→PR→NT	0.060	2.483	0.013	Supported
H9	PR→NT→INT	0.070	4.117	0.000	Supported
H10	PEU→CO→PT	0.291	7.164	0.000	Supported
H11	CO→PT→INT	0.263	7.164	0.000	Supported
H12	PEU→PR→NT→INT	0.013	2.365	0.018	Supported
H13	PEU→CO→PT→INT	0.137	5.502	0.000	Supported

is the most important factor for the performance of intention to use an E-wallet with a score of (0.342; 82.748), followed by the perceived trust with a score of (0.470; 74.717), compatibility (0.263; 73.864), perceived new technology (0.225; 73.784), and perceived risk (0.070; 64.526).

6. Discussion and findings

Mobile use increased in the last decade, and mobile has become a personal device to execute multiple activities and perform financial transactions with mobile. Mobile-based E-wallet applications attracted the user's attention, and effective services replace the traditional use of cash to complete daily financial transactions [50]. Using an E-wallet empowers users to perform financial transactions conveniently [44]. The current study results advocate that the Indonesian samples consider that the E-wallet ease of use, facilitating conditions, perception of new technology, perceived trust, and perceived risk significantly influence E-wallet use intention [89,90]. The study's model integrates the E-wallet's ease of use, the usefulness of E-wallet, compatibility, social influence, perception, facilitating conditions, perception of trust, and risk of new technology for the use of E-wallet service providers, influencing the E-wallet usage of intention as well as the acceptance of using E-wallet.

The E-wallet usefulness significantly influences young Indonesians' E-wallet use intensive purpose. The present outcomes extend the support for Aji, Berakon, and Husin's [11] work that the usefulness promotes the user's intention to use the E-wallets among Malaysian and Indonesian consumers. Moreover, among the Indonesian samples, the perception of enabling conditions for using this E-wallet influences the intention to utilize this e-wallet. The study shows the outcome postulated by Baishya and Samalia Baishya and Samalia [91] that the perceived facilitating circumstances encourage the intention to use the E-wallet among the consumer from developing countries. Next, consumers' level perception of compatibility is linked to the intended use of the E-wallets among consumers. Our study results support the argument suggested by Lwoga and Lwoga [64] that the compatibility perception improved the consumer intention to use the technology. Similar results were reported by Chawla and Joshi [62] that lifestyle compatibility promotes the intention and purpose of getting used to mobile wallets among customers. Perception of trust and risk also significantly triggers the Indonesian sample's intention to use the E-wallets and supports the results postulated by Senyo and Osabutey [92]. The perception of trust and risk reduced the risk and improved the intention to use the E-payment systems [93].

Furthermore, ease of use insignificantly influences the intention to use the E-wallet among the study samples. The E-wallet users consider the E-wallet challenging to use and need to revamp in such a manner that using E-wallet becomes convenient for the users. Our study results match the outcome posited by Pandey and Chawla [36]. The technology users at the bottom of the pyramid or less educated find it more problematic to use the mobile phone-based application and think not to use it. The E-wallet management needs to address the issue and simplify the E-wallet use. The social influence of the E-wallet also has a significant negative impact on the intention to use the E-wallet. The social community is not much inclined to use the E-wallet or recommend it to each other. The general sense prevails that E-wallet is challenging to use, and many risks are associated with making a wrong transaction. Our study coincides with the result postulated by Chopdar et al. [94]. The users vary based on their perception of E-wallets; for the current study results, the perception of E-wallet suggestively affects the intention to use the E-wallets. Our study finding coincides with the result prescribed by Liébana-Cabanillas, Ramos de Luna, and Montoro-Ríos [44] that the individual inclination towards technology significantly predicts the intention to use mobile payment via QR code. The study results support the study model's robustness in explaining the intention to use E-wallet and later adoption of E-wallet among the Indonesian samples as well as for the outcome of sample prediction.

The present study aims to explore the reasons that influence a user's decision to use an e-wallet. This study suggests that perceived ease of use has a considerable direct and indirect impact on the intention to use an E-wallet payment in Indonesia. The study's results showed that perceived compatibility and perceived trust play a serial mediating role in the relationship between perceived ease of use and intention to use an E-wallet. The finding of this study is consistent with that reported by Ref. [15], who asserted that perceived trust, usefulness, and attitude mediate the connection between various antecedents and the behavioral purpose of using mobile wallets. Similarly [22], showed that perceived trust positively and significantly mediates the relationship between perceived compatibility and intention to use mobile wallet technology. In addition, this study revealed that perceived risk and perceived new technology also play a serial mediating effect in the relationship between perceived ease of use and intention to use E-wallet. However, as perceived risk positively impacts both perceived new technology and intention to use E-wallet, it creates uncertainty in e-wallet adoption. Thus, regarding e-wallet usage, managers must consider perceived risk a severe issue.

Perceived ease of usage is the most important antecedent of E-wallet payment usage in Indonesia. Thus, users should be informed that utilizing an E-wallet can serve monetary transactions as simply and quickly as possible. Furthermore, users may feel that using an E-wallet will help them execute financial activities. Higher perceived ease of use can lead to greater compatibility, increasing trust and

Table 10
IMP Map INT constructs, standardized effects, and Index Value Performances.

Variables	Construct Total Effects for Intention to use E-Wallet (INT)	Index Value Performances
Compatibility (CO)	0.263	73.864
Perceived Ease of Use (PEU)	0.342	82.748
Perceived new technology (NT)	0.225	73.784
Perceived trust (PT)	0.470	74.717
Perceived risk (PR)	0.070	64.526

Source: Author's data analysis

desire to use mobile wallet. As a result, mobile wallet providers and E-wallet managers should concentrate on the most up-to-date technology that allows users to conduct transactions quickly, easily, compatibly, trustily, and efficiently. These time, cost, and effort reductions will aid in improving user perceptions of benefits.

In addition, even though perceived ease of use is the essential factor in the E-wallet environment, the findings of this study revealed that perceived compatibility and trust play a crucial role in e-wallet adoption. Compatibility and trust perception significantly improve users' intention to adopt e-wallet [21,48]. Mobile wallet providers should emphasize application architecture and deliver compatible and useable technologies to acquire user trust and increase behavior intention. To boost users' intention to accept the e-wallet service, system providers, including banks, must raise the helpful features of the technology and develop their corresponding brand personality to show a high level of compatibility with customers. Regarding management implications, the results offer feedback and suggestions for e-wallet users to develop various managerial techniques to increase E-wallet usage intentions. Operators must devise several tactics for boosting perceived ease of use, perceived trust, and compatibility and decreasing perceived risk to enhance the potential of E-wallet adoption. This study suggests that increasing trust and lowering perceived risk are vital for E-wallet acceptance, as Indonesian users feel a high risk when utilizing E-wallet services. In addition, compatibility is a key aspect in deciding whether to use E-wallet. Hence, banks should design their mobile banking systems with their client's lifestyles and preferences in mind. Moreover, a public awareness campaign demonstrating how simple and trust it is to use an E-wallet must be conducted to attract all categorical individuals to adopt E-wallet mobile payment.

7. Conclusion

The current work aimed to explore the intention to use the E-wallet among the Indonesian samples with the attributes of E-wallet usefulness, social influence, usage ease, facilitating conditions, risk, trust, new technology, and compatibility perceptions. The present study affords to offer the current scholarship relating to consumer E-wallet adoption in three varied ways. This research promotes the principal scholarship about the choice of E-wallet utilization that the E-wallet attributes of usefulness, facilitating conditions, compatibility, perception of trust, risk, and perception of new technology for E-wallet positively influence the formation of an intentional aim to use the E-wallet. However, the social influence and ease of usage for E-wallet are not affecting the advance of the intention to use E-wallet. Moreover, most studies reconnoitered the intention of using E-wallet in advanced Western nations [5]. The current research backs the existing efforts to study the intention to use E-wallet in an emerging economy like Indonesia. Presently, the perceived usefulness and social influence of using the E-wallet are unfavorable in developing countries. Users from developing countries are always looking for Government encouragement or incentives to develop the intention to adopt technologies like E-wallet or e-payments [8].

The current study adds to consumers' perceptions of adopting E-wallet in two ways. The study result postulates that E-wallet usefulness is not available to the study users. More promotion and usability require to promote the perception of usefulness among the Indonesian population. From the current user perspective, the social influence needs improvements as a user cannot support the social community to use the E-wallet. Nevertheless, the current study postulates that the users find the trust, compatibility, and risk perception at an appropriate level to influence the formation of an intention to use E-wallet significantly. The current study has three associated limits, the data collected in a specific cross-section manner and having general limitations. Therefore, the upcoming studies should investigate the intention to use E-wallet longitudinally where data collected over a long time to access the adoption or non-adoption of E-wallets. The user intention developed based on the E-wallet features of usage ease, practicality, trust, facilitating condition, and compatibility varies over time. Moreover, estimating users' intention and consistent use of E-wallet based on their income, job, business, location, and education. Further study should include more relevant E-wallet characteristics that can contribute to the user's intention to use E-wallet.

The aim of the current research is to determine possible factors that influence a user's willingness to utilize an electronic wallet. According to the results of this study, perceived ease of use has significant direct and indirect effects on the intention to use an E-wallet in Indonesia. The outcome of the current research reveals that perceived trust, perceived ease of use, and perceived new technology displayed a significant and positive direct impact on the intention to use E-wallet. The research outcomes support that perceived compatibility and trust are a serial mediator in the relationship between perceived ease of use and intention to use E-wallet. Similarly, perceived risk and perceived new technology are serial mediators in the relationship between perceived ease of use and intention to use an E-wallet. The IPMA signified that E-wallet management should focus on perceived ease of use, perceived trust, perceived compatibility, perceived new technology, and perceived risk to improve and achieve E-wallet adoption in the Indonesian population.

Even though this study is incredibly beneficial, it does have certain shortcomings. To begin with, E-wallet services are not widely

used worldwide, particularly in Indonesia. Thus, the findings of this study may not be generalizable. In addition, the data used in this research was cross-sectional, and users' intentions to use E-wallet services may alter over time. Thus, longitudinal data may be employed in future studies. This study has focused on general risk. Thus, future studies may uncover other categories of risk associated with technology use, such as personal and social risk, performance risk and psychological risk, and financial and functional risk. Moreover, future research into the influence of demographic variables such as age, gender, education, and income on behavioral intention to use E-wallets might provide greater insight into E-wallet acceptance and understanding. The present study aimed to assess user intention for the E-wallet. It would be exciting to explore the adoption of an E-wallet with a qualitative research strategy. Additional research will be able to create an assessment of the role of government or E-wallet service provider campaigns that promote consumer behavior toward E-wallets. In addition, it will stimulate to acceptance of more cognitive-social variables that can ultimately foster consumers' propensity to use E-wallets in different geographical contexts. Furthermore, previous user familiarity or experience with E-wallets may ignore the low impact of social influence for the intended purpose of using E-wallets.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material. Further inquiries can be directed to the corresponding author/s.

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Ethical statement

Ethical Statement/Approval is not applicable because the research paper does not include animals and humans as subjects.

CRediT authorship contribution statement

Noorshella Che Nawi: Data curation, Conceptualization. **Husna Sarirah Husin:** Data curation, Conceptualization. **Noura Said Al-Jahwari:** Writing - review & editing, Writing - original draft. **Siti Afiqah Zainuddin:** Software, Methodology, Formal analysis. **Noor Ullah Khan:** Software, Methodology, Formal analysis, Data curation. **Ariezal Afzan Hassan:** Writing - review & editing, Writing - original draft. **Wan Suzanna Aafanii Adeeba Wan Ibrahim:** Writing - review & editing, Writing - original draft, Resources. **Amaal Fadhlini Mohamed:** Writing - review & editing, Writing - original draft. **Nazatul Syima Mohd Nasir:** Writing - review & editing, Writing - original draft, Project administration. **Md Zaki Muhamad Hasan:** Resources, Project administration, Investigation.

Declaration of competing interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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