

Facilitating the Influence on Adopting E-Wallets: an Extended Technology Acceptance Model (TAM) Approach

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Abstract

Understanding the factors that influence consumers' payment choices is crucial for the advancement of e-commerce and digital transactions. This research investigates the correlation between perceived ease of use, perceived usefulness, perceived credibility, and self-efficacy in shaping these decisions, shedding light on pivotal aspects of consumer behavior in the digital landscape. A comprehensive investigation was conducted with the participation of 250 Malaysians through an online questionnaire hosted on Google Forms using judgemental sampling technique. The findings underscore a significant positive relationship between perceived ease of use, perceived usefulness, perceived credibility, and self-efficacy, exerting considerable influence on the adoption of e-wallets among Malaysian consumers. The study illuminates the substantial contribution of these factors to the wider acceptance of e-payment systems and the standardization of e-commerce system architecture. By delving into consumer self-efficacy and information confidentiality, this research enriches understanding across various dimensions of e-commerce, offering valuable insights for businesses operating in the digital realm. Future research endeavors could explore additional facets of consumer behavior in the e-commerce landscape. Investigating the evolving dynamics of digital transactions, analyzing emerging payment technologies, and delving deeper into the interplay between consumer preferences and technological advancements could provide further insights into optimizing strategies for online businesses.

Keywords: E-Wallet, Self-Efficacy, Perceived Credibility, Technology Accepted Model, Malaysia

Introduction

In the contemporary age of technological progress, technology has seamlessly integrated into diverse facets of our lives, with a notable impact on the financial sector. Malaysia has

experienced a noteworthy surge in the utilization of e-wallets in recent years, driven partly by environmental conservation efforts (Tech Collective, 2023). Despite not reaching adoption rates seen in some other nations such as China, the government has undertaken various initiatives, campaigns, and incentives to foster a shift among both consumers and businesses towards digital payments, steering away from conventional cash transactions (Chuah et al., 2019).

Furthermore, the advent of smartphones in the early stages of information technology has played a pivotal role in propelling the adoption of e-wallets in Malaysia. In contemporary times, the ownership of a mobile phone has become ubiquitous, facilitating the easy download and utilization of e-wallet applications, thus enhancing the accessibility and user-friendliness of digital payments (Dube & Helkkula, 2015). Mobile payments have assumed a vital role in people's lives, especially during the COVID-19 pandemic, where there is a prevailing encouragement for contactless payments. E-wallets have emerged as indispensable tools for entrepreneurs and small and medium-sized enterprises (SMEs) seeking to digitize their payment processes and establish more robust connections with consumers (Tech Collective, 2023). This transition to cashless methods has inspired businesses to embrace digital payments. Consequently, comprehending the factors influencing the acceptance of mobile payments becomes imperative for e-wallet service providers, as customer engagement and usage constitute pivotal elements for their success.

Malaysia has witnessed the rise of several prominent e-wallet providers that have not only gained popularity but also earned the trust of users. Market leaders such as Touch 'n Go eWallet, GrabPay, Boost, and Maybank QRPay have firmly established themselves in the landscape (Oppotus, 2023). These platforms empower users to make payments at diverse merchants, encompassing both physical stores and online platforms. E-wallets offer the added convenience of facilitating fund transfers to friends, family, or customers across different regions and promoting contactless payments. The growing acceptance of e-wallets among consumers and businesses has significantly contributed to their overall expansion and popularity in Malaysia. The ongoing transition from traditional cash transactions is anticipated to persist as more individuals embrace digital payments and experience the myriad benefits offered by e-wallets. Moreover, the evolving e-wallet ecosystem, coupled with continuous advancements in financial technology, is poised to enhance the functionality and convenience of e-wallets, paving the way for even greater adoption in the future.

Literature Review

Technology Acceptance Model (TAM)

Based on the extensively used Technology Acceptance Model (TAM), which is employed to scrutinize the adoption of new technological advancements, this research aims to explore the utilization of an e-wallet as a transaction instrument among consumers in Malaysia (Astari et al., 2022; Chuah et al., 2019; Karim et al., 2020). The Technology Acceptance Model (TAM) developed by Davis (1989) serves as the theoretical framework for this study, providing a deeper understanding of consumers' willingness to adopt a particular technology. According to Pertiwi et al (2020), TAM is a tool for measuring knowledge adoption decisions that has been proven to be conceptually reasonable and useful for identifying the factors that influence user adoption of a technology. TAM is a model capable of elucidating complicated human behavior and extending for further examination of the components that affect this

response towards the adoption of various systems (Alalwan et al. 2016). Davis (1989) explained TAM as encompassing customer behavior across a wide variety of computing technologies and individuals, clarifying factors of technology acceptance.

Adoption of E-Wallet (AOE)

The term "e-wallet" refers to a device application that enables users to conduct business transactions, including payments. Individual messages are encrypted for safety purposes on this platform, situated in the virtual environment (Raimee et al., 2021). An electronic wallet serves as a digital, cashless facility where tangible cash is no longer required. Customers no longer need to travel to ATMs or banks for withdrawals when making purchases; instead, transactions can be completed in a fraction of a second (Komba & Abd Razak, 2021). According to Karthikeyan and Kumar (2021), one of the most recent breakthroughs is the e-wallet, a smartphone service that allows users to manage and conduct transactions, access special deals, pay utilities, make secure purchases, issue pay checks, store e-receipts, and use coupons directly from the platform.

The study aims to examine the factors influencing the acceptance and usage of e-wallets among individuals in the country. E-wallet adoption is rapidly growing worldwide, particularly in Malaysia, due to the impact of the Covid-19 pandemic (Chaveesuk et al., 2022). The ability of e-wallets to enable contactless transactions and reduce the risk of virus transmission has encouraged their usage. However, the adoption of e-wallets in Malaysia faces several challenges and barriers that hinder their widespread usage among the population. Despite the rapid global growth of e-wallets, Malaysians encounter issues related to usefulness, knowledge, familiarity, and technical problems when it comes to embracing and utilizing e-wallets (Chan et al. 2020). These challenges have resulted in a lower adoption rate compared to other countries, with many individuals still relying on traditional cash transactions (Chan et al., 2020). It is crucial to address these barriers and understand the factors influencing the adoption of e-wallets in Malaysia to promote their usage and reap the benefits of a cashless society.

Perceived Ease of Use (PEOU)

According to Azman et al (2020), perceived ease of use (PEOU) necessitates issues of utilization that are simple to comprehend and navigate. PEOU also provides a consumer's perspective on current information technologies. This indicates that if a technology system is perceived as more user-friendly than others, it is likely to be used more. PEOU is a solution that employs a specific strategy to reduce user effort. It can be employed to acquire contemporary knowledge resources as well as handle duties efficiently. The customer would benefit from the platform's quick adaptation and ease of use of digital technologies (Azman et al., 2020). According to Yang et al (2021), perceived ease of use contributes positively towards how simple it is for a consumer to use a particular item may indeed enhance their usage of e-wallet platform. A significant and positive correlation has been shown in numerous studies between perceived ease of use and e-wallet uptake (Chuah et al., 2020; Flavian et al., 2020; Sarmah et al., 2021). Therefore, a hypothesis is revealed

H1: Perceived ease of use positively influences the adoption of e-wallet in Malaysia.

Perceived Usefulness (PU)

The implementation of new technologies to improve work efficiency is referred to as perceived usefulness (PU) (Azman et al., 2020). In essence, PU is a user's cognitive anticipation about the system's performance. Clients perceive that employing such a platform could enable them to accomplish their budgetary and leisure objectives while also enhancing the efficiency with which they complete financial transactions (Yang et al., 2021). Al-Marroof and Al-Emran (2018) discovered a substantial association between perceived usefulness and the actual willingness to adopt a specific application using the TAM model. Besides, according to Karim et al. (2020), perceived usefulness is defined as a person's belief that adopting a distinct approach may enhance overall productivity. According to Yang et al. (2021), digitization contributes to the data delivery platform, thereby increasing the impact of the platform's perceived usefulness on e-wallet adoption. Consumers assume that using a e-wallet platform might enable them to achieve their monetary as well as personal aspirations, including an increase in the speed of transactions. Numerous studies indicate that perceived usefulness significantly influences customers' willingness to adopt online payment systems, such as e-payment, e-banking, and e-wallet (Chuah et al., 2020; Thakur & Srivastava, 2014; Sarman et al., 2021). Therefore, a hypothesis is formulated as

H2: Perceived usefulness positively influences the adoption of e-wallet in Malaysia.

Perceived Credibility (PC)

Perceived credibility (PC) describes the extent to which a potential consumer feels that the infrastructure is free of confidentiality concerns. PC is identified as the perception that a collaborator is reputable and has the necessary ability to conduct an operation (Gupta et al., 2019). Therefore, PC is used as a new metric in electronic wallet (e-wallet) adoption to indicate security requirements. According to Yaakop et al (2021), security and privacy are two important aspects of perceived credibility. The extent to which a customer considers that using an e-wallet technique would be secure is characterized as perceived security and privacy. The amount of online transactions is recognized as a fundamental issue in the development of e-commerce. Customers prefer their private details and identities to be kept confidential because they are concerned about their credentials being exploited for fraudulent transactions. According to Yaakop et al (2021), they discovered that perceived credibility has a strong and beneficial influence on performance expectancy to adopt e-wallets. According to their results, perceived credibility has a greater effect on the behavior of employing e-wallet or mobile money services. As a result, perceived credibility is associated with using an e-wallet platform (Taufan and Yuwono, 2018). Therefore, a hypothesis is formed as:

H3: Perceived credibility positively influences the adoption of e-wallet in Malaysia.

Self-efficacy (SE)

The phrase "self-efficacy" pertains to an individual's conviction in what they can accomplish with their talents and abilities, as well as how hard or easy it is to complete tasks. Mobile self-efficacy (MSE), which evaluates users' confidence in acquiring mobile applications, was described by (Duane et al., 2014). The research aims to determine whether e-wallet users possess the skills and capabilities to employ e-wallets (Gbongli et al., 2019). The indication that such a personal belief maintains its basic foundation and plays a direct part in a person's

performance and behavior is dominant in Bandura's idea of self-efficacy. This implies that users of e-wallets are much more likely to engage in behaviors within their perceived skills, which is a key aspect in determining how people adapt to various technologies (Gbongli et al., 2019). In the context of information technology adoption, self-efficacy has a significant relationship with using e-wallets. As a result, the uptake of mobile applications is significantly influenced by self-efficacy.

H4: Self-efficacy positively influences the adoption of e-wallet in Malaysia.

Based on the above discussion, this study's research framework is illustrated in Figure 1.

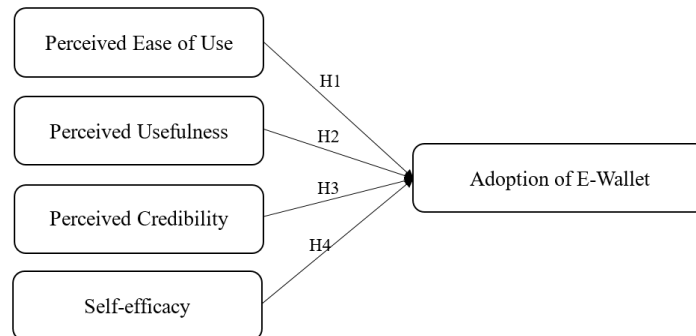


Figure 1: Proposed Research Framework

Methodology

In November 2023, a survey was carried out in Malaysia using the online platform (Google Form) method from individuals aged 18 and above with no prior experience in adopting e-wallet platform and employing the non-probability judgmental sampling technique in line with established research practices (Sekaran & Bougie, 2019). G*Power 3.1.9.7 software was utilized, with the analysis indicating a need for a sample size of 138, considering an effect size of 0.15 and an 80% power level (Hair et al., 2017). A total of 250 usable questionnaires were collected, with 15 incomplete responses excluded from the analysis. Surveyed respondents were predominantly of Chinese ethnicity, mostly female, retired, and aged between 51 years old and above, as summarized in Table 1. Structural Equation Modeling-Partial Least Squares (SEM-PLS) was employed for both the measurement model and the structural model analysis. Data analysis utilized SmartPLS 3.0 and SPSS software, following the methodology outlined by Ringle et al. (2015). Indicator items for constructs were adapted from previous research and customized for the luxury fashion context. A 5-point Likert scale, ranging from (1) strongly disagree to (5) strongly agree, were employed, as recommended by (Malhotra et al., 2017).

Table 1

Demographic profiles of respondents

Variable	Classification	Frequency	Percentage (%)
Gender	Male	80	32.0
	Female	170	68.0
Age (screening question)	18-30 years old	33	13.2
	31-40 years old	14	5.6
	41-50 years old	62	24.8
	51-60 years old	82	32.8
	Above 60 years old	59	23.6
Ethnicity	Malay	80	32.0
	Chinese	126	50.4
	Indian	36	14.4
	Others	8	3.2
Have you used e-wallet platform before? (screening question)	Yes	0	0
	No	250	100.0
Employment	Employed	50	20.0
	Unemployed	3	1.2
	Retired	126	50.4
	Housewife	40	16.0
	Student	31	12.4

Findings*Measurement model analysis*

When evaluating the measurement model, it is crucial to consider both convergent and discriminant validity, as recommended by (Hair et al., 2017). The criteria set by these authors include item loadings of at least 0.7, an average variance extracted (AVE) of 0.5, and a composite reliability (CR) of 0.7. The findings of this study indicate that all items met these criteria, surpassing the 0.7 loading threshold. Furthermore, AVE and CR values for all constructs exceeded 0.5 and 0.7, respectively, confirming convergent validity as presented in Table 2. Discriminant validity was thoroughly examined using the Heterotrait–Monotrait (HTMT) criteria proposed by Henseler et al (2015), with the stipulation that HTMT values should be less than 0.85 (Kline, 2011). The results provided in Table 3 demonstrate that all HTMT values were below 0.85, offering robust evidence of discriminant validity. These evaluations emphasize the reliability and robustness of the measurement model.

Table 2

Assessment of construct reliability and convergent validity

Latent Variable	Item	Loading	AVE	Cronbach Alpha	CR
Perceived Ease of Use (Che Nawi et al. 2022)	PEOU1	0.930	0.859	0.959	0.968
	PEOU2	0.932			
	PEOU3	0.939			
	PEOU4	0.924			
	PEOU5	0.908			
Perceived Usefulness (Che Nawi et al. 2022)	PU1	0.885	0.746	0.915	0.936
	PU2	0.865			
	PU3	0.833			
	PU4	0.876			
	PU5	0.859			
Perceived Credibility (Che Nawi et al. 2022)	PC1	0.911	0.797	0.915	0.940
	PC2	0.900			
	PC3	0.895			
	PC4	0.830			
	PC5	0.845			
	PC6	0.835			
Self-efficacy (Mouakket, 2020)	SE1	0.860	0.708	0.897	0.924
	SE2	0.819			
	SE3	0.851			
	SE4	0.858			
	SE5	0.818			
Adoption of E-Wallet (Teo et al. 2020)	AOE1	0.925	0.809	0.921	0.944
	AOE2	0.888			
	AOE3	0.919			
	AOE4	0.865			

Table 3

Assessment of discriminant validity using the HTMT criterion

	1	2	3	4	5
1.AOE					
2.PC	.562				
3.PEOU	.769	.437			
4.PU	.820	.618	.845		
5.SE	.738	.601	.796	.795	

Note: Adoption of E-Wallet (AOE), Perceived Credibility (PC), Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Self-Efficacy (SE)

Structural Model Analysis

A structural model analysis was conducted to explore the relationships between variables. Hypotheses were tested through bootstrapping with a resample size of 5,000 (Hair et al., 2017). The study provided support for several hypotheses. The perceived ease of use (PEOU) value had a significant impact on the adoption of e-wallet (AOE) ($\beta = 0.279$ and $p < 0.001$), supporting H1. Similarly, perceived usefulness (PU) significantly influenced the adoption of e-

wallet (AOE) ($\beta = 0.370$ and $p < 0.001$), leading to the acceptance of H2. Perceived credibility (PC) positively affected the adoption of e-wallet (AOE) ($\beta = 0.126$ and $p < .01$), supporting H3. The analysis confirmed that self-efficacy (SE) also positively impacted the adoption of e-wallet (AOE) ($\beta = 0.131$, $p < .001$), supporting H4. The proposed model explained 63.8% of the variance in the adoption of e-wallet, indicating a moderate model fit (see Table 4).

Table 4

Assessment of structural model with bootstrapping procedure

Hypothesis and Path	Std. Beta	Std. Error	t-value	p-value	Decision	Effect Size
H1: PEOU → AOE	0.279	0.275	3.314***	0.000	Supported	Large
H2: PU → AOE	0.370	0.375	4.041***	0.000	Supported	Large
H3: PC → AOE	0.126	0.124	2.048**	0.017	Supported	Large
H4: SE → AOE	0.131	0.133	1.619**	0.048	Supported	Small

Note: **Significant at $p < .050$ (one-tailed test); *** Significant at $p < .001$ (one-tailed test).

Discussion and Implications

In the realm of digital transactions, consumers often weigh the simplicity and user-friendliness of electronic wallets (e-wallets) against their existing payment methods before deciding to embrace this innovative technology. While the allure of a straightforward and convenient solution is evident, the investment of time and effort required for adopting a new e-wallet may not always be justified (Aydin, 2016). This underscores the importance of perceived ease of use (PEOU) as a critical factor in the adoption process. For individuals proficient and comfortable with technological tools, their familiarity and ease with such products significantly influence the likelihood of adopting e-wallets (Kulviwat et al., 2014). Consequently, the design and functionality of e-wallets should prioritize a seamless user experience, comparable if not superior to other existing payment options like traditional bank cards. This emphasis on PEOU becomes pivotal, emerging as a fundamental aspect that contributes value by positively influencing behaviors within the realm of virtual transactions (Aydin, 2016). Recognizing the pivotal role of PEOU, it becomes imperative to establish a more efficient and user-friendly framework for e-wallets. This enhancement aims to ensure that adopting e-wallets is not perceived as an additional burden but as a streamlined and advantageous choice for users. Consequently, the user's comprehension of the functions and features of e-wallets is crucial, as the perceived ease of use becomes a driving force influencing user behavior and fostering adoption. In essence, creating an ecosystem where the perceived ease of use aligns seamlessly with user expectations is fundamental to the widespread adoption of e-wallets in the dynamic landscape of digital transactions.

The intersection of advanced technical capabilities and their perceived usefulness (PU) plays a pivotal role in shaping customers' inclinations towards utilizing sophisticated services, such as electronic wallets. The utilization of advanced services is intricately linked to the perceived usefulness, and the nexus between these factors serves as a key determinant of actual usage behaviors. In the context of Technology Acceptance Model (TAM), a cornerstone principle is that a consumer's positive perception of a system's usefulness is instrumental in influencing their acceptance and utilization of it to reap potential benefits (Aydin, 2016). When a consumer recognizes the utility and practicality of a system, it fosters a positive perception,

encouraging them to engage with it and harness the potential advantages it offers. This perspective on perceived usefulness serves as a conceptual framework in the literature, particularly when exploring the utility provided by innovative technological platforms. Conversely, a significant impediment to the widespread adoption of e-wallet platforms lies in the lack of tangible benefits or a clear understanding of the advantages conferred by these digital tools. Addressing this challenge is essential for overcoming barriers to adoption. Enhancing consumer awareness about the real advantages of e-wallets becomes paramount, as it not only dispels misconceptions but also fosters a greater understanding of the practical benefits that users stand to gain. In essence, bridging the gap between advanced technical capabilities and users' perceptions of usefulness becomes a crucial stride toward overcoming obstacles and fostering the mass adoption of e-wallet platforms in the ever-evolving landscape of digital transactions.

Perceived credibility (PC) assumes a critical role in shaping a potential consumer's confidence in an electronic wallet (e-wallet) system, particularly regarding the assurance that sensitive and confidential information is safeguarded (Gupta et al., 2019). The assessment of perceived credibility extends across three key dimensions: security measures, the integrity of transactions, and adherence to regulatory safety standards. These dimensions collectively contribute to shaping the overall perception of a credible e-wallet platform. Concerns persist regarding the potential for unauthorized access, deceptive financial transfers, and manipulation of user data. Users, understandably, express apprehensions about issues like failed transactions and the security of their login credentials, such as usernames and passwords. In this context, ensuring the perceived credibility of an e-wallet hinges on not only robust security measures but also on addressing specific user concerns related to transactional integrity and confidentiality. A secure e-wallet platform, as articulated by Mun et al (2017), is one that not only meets but exceeds consumer expectations. This involves not only technical security measures but also effective communication and transparency to assure users that their confidential information is handled with the utmost care and integrity. The ongoing significance of addressing perceived credibility in the realm of e-wallets becomes evident, reflecting the dynamic landscape of digital transactions and the evolving nature of security concerns among users.

Within the realm of digital transactions, e-wallet self-efficacy emerges as a pivotal concept, encapsulating a customer's self-assessment of their ability to adeptly navigate and utilize digital payment software. Pankajam and Raaj (2018) emphasize that user willingness to persist in using a technology is shaped by both their proficiency in operation and the features offered by the platform. Efficiency perceived by users in their interactions with e-wallets becomes a key determinant of their inclination to sustain usage. Consumers endowed with higher levels of e-wallet self-efficacy are likely to perceive the software as less complex and challenging. Their confidence in technical capabilities fuels their enthusiasm for using the e-wallet, creating a positive feedback loop. Essentially, the research findings align with the broader discourse on self-efficacy in technology adoption, corroborating insights from prior studies (Baganzi & Lau, 2017; Gbongli et al., 2019). The interconnected nature of these studies contributes to a nuanced understanding of the role of self-efficacy in fostering user confidence and driving the adoption of digital payment solutions like e-wallets.

The proactive approach of e-wallet owners in organizing training courses and promotional activities serves as a strategic initiative to bolster users' proficiency with mobile technology, thereby elevating their self-efficacy. While these initiatives may not be explicitly tied to mobile banking services, they play a pivotal role in enhancing perceived usefulness, ease of use, and credibility—crucial factors that collectively shape the adoption trajectory of electronic wallets. In the realm of digital technology, confidentiality emerges as a paramount concern. Consequently, e-wallet operators must underscore their commitment to robust confidentiality features to cultivate a favorable willingness among consumers. A positive reputation in terms of safeguarding sensitive information not only engenders trust but also significantly contributes to fostering better customer adoption of this innovative payment technology. Given consumers' inherent preference for secure platforms to mitigate the risk of fraud, the assurance of confidentiality becomes a cornerstone in the adoption decision.

Simultaneously, to stimulate consumer adoption of e-wallets, operators can introduce enticing deals for early adopters. Offering rebates or rewards for utilizing e-wallets acts as a powerful incentive, influencing consumer acceptance. This strategy not only enhances the perceived benefits of e-wallet usage but also contributes to building a positive association with the technology. In the backdrop of the COVID-19 pandemic, where governments worldwide recommend digital payments to minimize physical contact, the intensification of e-wallet usage becomes particularly relevant. E-wallets offer a convenient, contactless solution, aligning with health guidelines and creating a conducive environment for their widespread adoption. The confluence of promotional efforts, robust security features, and strategic incentives positions e-wallets as a compelling and user-friendly choice in the evolving landscape of digital transactions.

Conclusion and Recommendations for Future Studies

The Technology Acceptance Model (TAM) was applied to explore factors influencing e-wallet adoption in Malaysia. Findings reveal that perceived ease of use, perceived usefulness, perceived credibility, and self-efficacy significantly impact consumers' decisions to adopt e-wallets. Simplifying e-wallet use, is crucial for adoption. Perceived usefulness aligns with previous studies, especially evident with government incentives like 'e-Tunai Rakyat.' Credibility influences users' attitudes, advocating for authorities to transparently communicate encryption methods and combat fraud, reducing misconceptions and enhancing consumer trust in e-wallets. Ultimately, this study offers valuable insights for Malaysian consumers, e-commerce marketers, and electronic device vendors. The findings can be employed to develop and implement effective policies and strategies in the realm of electronic wallets, aiming to attract users who may have had reservations and impact their adoption decisions positively.

The primary drawback lies in the cross-sectional survey design, capturing data at a single moment, limiting insights as participant perspectives may evolve post-research. Future investigations should consider employing a longitudinal approach for a more comprehensive understanding of e-wallet adoption. A longitudinal approach, tracking participants over time, provides a dynamic view of evolving perspectives and behaviors, offering a more comprehensive insight into the adoption process. Future research endeavors could greatly benefit from embracing longitudinal studies, enabling a nuanced exploration of factors influencing e-wallet adoption.

Additionally, the utilization of self-administered questionnaires resulted in incomplete data due to dropouts, lacking control in online submissions. This study, therefore, validates connections among variables rather than establishes causation. Future questionnaire preparation requires careful consideration and selection of realistic variables to ensure that various types of variables accurately reflect their effects. This meticulous approach in questionnaire preparation ensures that the research captures a holistic picture, contributing to a more nuanced comprehension of the intricate dynamics influencing e-wallet adoption.

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