E-Wallet Payment Usage Among Young Consumers Using Technology Continuance Theory

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Abstract: Technological innovation has paved the way for the widespread adoption of e-wallets in Malaysia. This trend has been bolstered by government initiatives and incentives promoting cashless transactions. The study aims to contribute to the ongoing efforts to encourage cashless transactions and move towards a cashless society in Malaysia and beyond. The study collected data from 443 university students who had used e-wallets for payment transactions. The analysis examined the relationships between key constructs in the Technology Continuance Theory framework. The results revealed that a positive attitude towards e-wallets significantly influences students' intention to continue using them. Additionally, perceived usefulness emerged as a crucial factor influencing students' attitudes and overall satisfaction with e-wallets. However, the study did not find a significant relationship between perceived ease of use and attitude, suggesting that ease of use may not be a primary driver of students' attitudes toward e-wallets. The theoretical implications of this study contribute to a deeper understanding of e-wallet adoption among the younger generation in higher learning institutions and provide valuable insights for the industry players. The practical implications offer guidance to key players in shaping e-wallet applications to meet the specific needs of university students, ultimately encouraging greater adoption and usage. Future research could explore additional variables and employ longitudinal studies for more comprehensive results.

Keywords: *E-wallet, intention behaviour, technology continuance theory, cashless campus, fintech.*

1. Introduction

One of the most transformative shifts in financial transactions has occurred in the ever-evolving global technology landscape. The advent of electronic payment systems has not only revolutionised businesses but has also reshaped the very fabric of economic interactions. At the forefront of this digital financial revolution is the electronic payment system, a mechanism that leverages the vast reach of the Internet to facilitate seamless transactions (Fatonah et al., 2018). Among the various manifestations of this technological innovation, the electronic wallet (e-wallet) stands out as a beacon of convenience and efficiency (Junadi & Sfenrianto, 2015). E-wallets have transformed into essential everyday tools. They are secure virtual vaults for your money, offering remote access and user-friendly interfaces to manage your finances anytime, anywhere. The significance of the e-wallet is particularly pronounced in Malaysia, where a dynamic array of 42 licensed e-wallets, including prominent names like Touch' n Go, GrabPay, FavePay, and Boost, operate under the official sanction of the Central Bank (Abdullah et al., 2020). These e-wallets have replaced traditional cash transactions and redefined the dynamics of commerce by mitigating the need for individuals to carry substantial amounts of physical currency. The advantages extend beyond convenience, as e-wallets reduce transaction times and accelerate payment processes (Purnamawati et al., 2023).

As a result, the financial landscape of Malaysia has witnessed a transformative shift, propelled by the widespread adoption and integration of e-wallets into various facets of daily transactions. This technological metamorphosis gained further momentum with the onset of the COVID-19 pandemic. In response to the need for contactless transactions, e-wallets emerged as the primary choice for Malaysians conducting their financial affairs. The growth of the e-wallet industry extends beyond consumer adoption. Businesses across retail, food and beverage, big and small vendors, online commerce, and transportation have seamlessly integrated e-wallets, highlighting their significant impact (Niu et al., 2023). The versatility and efficiency of e-wallets have made them indispensable tools for businesses navigating the demands of a rapidly changing economic landscape. Amid this technological renaissance, a significant demographic driving the adoption of e-wallets is the tech-savvy and youthful consumer base. Young customers, characterised by their adeptness with technology, are predicted to be the vanguards of e-wallet usage due to the myriad features and conveniences

offered by these digital financial tools (Sinha et al., 2019). Moreover, the Malaysian government has actively played a role in fostering the adoption of e-wallets, particularly among the youth aged 18-20.

Initiatives such as e-Tunai Rakyat, e-Penjana, e-Belia scheme, e-Pemula, and e-Tunai Belia Rahmah provide financial incentives, encouraging the uptake of e-wallets in their daily routines. Despite the initial surge in ewallet downloads fueled by government incentives, a curious phenomenon emerges wherein usage tends to decline once these incentives are depleted (Kaur & Bahar, 2022). This intriguing trend underscores the need to delve deeper into the factors that influence sustained e-wallet usage (Cavusoglu, 2019), especially as Malaysia propels itself towards the realisation of a cashless society, driven by the increasing prevalence of e-wallets (Bank Negara Malaysia, 2019). Given the growing popularity of e-wallets in Malaysia, especially with government backing, this study investigates the factors influencing university students' intention to use them. This demographic is particularly pertinent as university students, typically entering tertiary education at 18, represent a crucial juncture in the adoption curve. Their embrace of e-wallets not only influences the immediate landscape but also holds implications for the nation's future trajectory of digital finance. To comprehensively explore and understand the intricacies of e-wallet adoption, we anchor our investigation in the Technology Continuation Theory (TCT). This theoretical lens provides a nuanced understanding of users' willingness to persist in utilising technology-based services or products, offering valuable insights into the factors that shape the ongoing relationship between users and e-wallets. This research endeavour is not merely an academic pursuit; it is a quest to unearth practical insights that can steer the course of e-wallet adoption in Malaysia and, by extension, contribute to the global discourse on the future of digital finance.

2. Literature Review

Understanding technology adoption can be complex. This study utilises the TCT developed by Liao et al. (2009) as a valuable framework. TCT builds upon three established models in Information Systems: the Technology Acceptance Model (TAM), the Expectation Confirmation Model (ECM), and the Cognitive Model (COG). TCT skilfully integrates these elements, creating a comprehensive framework that includes confirmation, perceived usefulness, perceived ease of use, satisfaction, attitude, and continuous intention.

Confirmation (CF) is particularly relevant to our study, representing individual satisfaction (Liao et al., 2009). Numerous studies illuminate a direct and positive correlation between confirmation, perceived usefulness, and satisfaction (Alraimi et al., 2015; Bhattacherjee, 2001; Oliver, 1980; Venkatesh et al., 2011). This alignment is crucial in e-wallets, where users' experiences are intricately tied to their initial expectations. Users perceive the technology as valuable when these expectations are met and exceeded, leading to heightened satisfaction. Confirmation acts as the linchpin in the user's journey with e-wallets. Users' choices are validated when anticipated benefits materialise, and a positive perception of the e-wallet's value is fostered. Users continuously evaluate their e-wallet experiences against initial expectations. Confirmation of these expectations plays a critical role in shaping their satisfaction, directly influencing how they perceive the overall usefulness of the technology.

Therefore, this study hypothesises that:

- H1: Confirmation directly influences users' perception of e-wallet usefulness.
- H2: Confirmation significantly increases user satisfaction with e-wallets.

Perceived usefulness plays a central role in technology adoption. It sheds light on users' perspectives and drives their continued engagement. As Davis (1989) noted, the belief that a system improves job performance (perceived usefulness) is crucial for understanding user behaviour. Evidence from research underscores the significance of perceived usefulness in shaping user intentions. Wu & Chen (2017) emphasise its role as a robust and direct determinant of continuance usage intentions. Beyond mere utility, perceived usefulness extends its influence, casting a cheerful glow on users' satisfaction, as noted by Bhattacherjee (2001) and fostering a favourable attitude, as indicated by Kustono et al. (2020). This interplay suggests a profound connection – if users perceive an e-wallet as applicable, a cascade of positive outcomes ensues. They not only harbour a positive attitude but also find satisfaction in its utility.

Informed by this concept of perceived usefulness, our study explores the following hypotheses that examine the interconnectedness of these factors in the context of e-wallet adoption:

- H3: Satisfaction with e-wallets increases as users perceive them to be more useful.
- H4: Perceived usefulness of e-wallets leads to a more positive attitude towards them.
- H5: Users who perceive e-wallets as valuable (applicable implies value) are likelier to continue using them.

These hypotheses elucidate the multidimensional influence of perceived usefulness on e-wallet adoption. They posit that a user's perception of utility triggers a sequential process leading to satisfaction, a positive attitude, and ultimately, a sustained relationship with e-wallets. In the ever-evolving digital landscape, perceived ease of use emerges as a compass.

Guiding users through the intricate maze of technological adoption. Coined by (Davis, 1989), it encapsulates an individual's perception that utilising a specific system demands minimal effort or is inherently straightforward. This perception of ease is pivotal in shaping the user's willingness to embrace new technology (Gupta et al., 2020). Previous research highlights the importance of Perceived Ease of Use (PEU) in technology adoption. Sinha et al. (2019a) found that users perceive a system as more useful (Perceived Usefulness) when it's easy to use. This positive perception can also lead to a more favourable attitude, as Ariffin and Lim (2020) show. Building on this knowledge, our study proposes the following hypotheses:

- H6: A user's perception of ease of use with e-wallets will positively impact their perception of usefulness.
- H7: Ease of use with e-wallets will positively affect users' attitudes towards them.

In cognitive theory, Oliver's (1980) pioneering work introduces a captivating perspective on understanding individual behavioural intentions. According to her, the intricate interplay between satisfaction and attitude is a compass for deciphering the complexities of human behaviour. The study underscores the critical role of satisfaction in influencing user attitudes and behavioural intentions towards e-wallets. Satisfaction, as defined by Bhattacherjee (2001), reflects a psychological state arising from comparing a user's expectations and the actual performance of the e-wallet. Extending Oliver's insights, our study aligns with previous investigations highlighting the profound impact of satisfaction. Scholars such as Foroughi et al. (2019) and Rahi et al. (2021) consistently affirm that satisfaction positively influences users' attitudes. When users find their experiences aligning with or surpassing expectations, a positive attitude naturally follows suit. Moving beyond perceived usefulness, our study explores the role of satisfaction and attitude in e-wallet adoption. A study by Shang and Wu (2017) suggests that technology satisfaction can positively influence attitude and intention to continue using it.

Based on this understanding, we propose the following hypotheses:

- H8: E-wallet user satisfaction leads to a more positive attitude towards the e-wallet.
- H9: E-wallet user satisfaction leads to a stronger intention to continue using the e-wallet.

As Liao et al. (2009) explain, attitudes reflect a person's feelings towards a specific behaviour. In e-wallet adoption, a positive attitude is a key indicator of a user's continued use intentions. Building on a prior study by Weng et al. (2017) and Wu & Chen (2017), which highlights the positive relationship between attitude and continued use, our final hypothesis is:

H10: A positive attitude towards e-wallets leads to a stronger intention to continue using them.

This hypothesis crystallises that the user's overall positive or negative sentiments toward e-wallets play a pivotal role in shaping their commitment to continued usage. As we navigate the nuanced landscape of e-wallet adoption, this hypothesis offers a lens through which we can unravel the intricacies of user attitudes, ultimately contributing to a more profound understanding of the factors influencing the sustained use of these transformative digital tools.

3. Methodology

To gather insights from young Malaysian consumers, this study targeted public university students with experience using e-wallets for payments. The data collection process occurred during the second quarter of 2023 and utilised a combination of offline and online surveys. A snowball sampling method was employed. After data cleaning, 443 usable responses were retained from the initial 501 participants. This study uses a single source survey; therefore, a common method bias (CMB) analysis must be done to ensure no bias issues in the collected data. Therefore, the research added a marker variable to the questions asked of the participants. The questions were adapted from Brian & Marcia (2022), which included four questions related to the colour blue for the participants. CMB analysis shows that the value of R2 on the endogenous study model does not increase compared to the calculation of the model before the market variable is included in the study model. Therefore, there is no bias issue in the data collected.

4. Data Analysis and Results

In this study, 443 individuals participated in the survey, providing valuable insights into their age groups, gender distribution, current residential areas, and education levels. Among the respondents, the majority fell within the age range of 18 to 21, accounting for 69.5% of the total sample. The second-largest age group was 22 to 25, constituting 29.3% of the participants. Regarding gender distribution, the study exhibited a higher representation of females, comprising 65.5% of the participants, while males accounted for 34.5%. Regarding current residential areas, most respondents resided in urban settings (60.0%), whereas 40.0% lived in rural areas. Moreover, the education level of the participants varied, with the most common category being diploma holders (47.9%), followed by those with degrees (45.4%). Interestingly, only a minority possessed a PhD (0.5%), and a smaller group had pre-diploma/certificate qualifications (6.3%). The measurement model analysis assesses how well the observed variables we measure represent the underlying concepts (latent constructs) we are interested in. This ensures that the data collected is a valid and reliable reflection of the theoretical constructs. Two primary analyses are involved: convergent validity and discriminant validity test. Hair et al. (2017) establish thresholds for evaluating measurement scales in partial least squares structural equation modelling (PLS-SEM). They recommend that all factor loadings exceed 0.7, composite reliability (CR) surpasses 0.7, and the average variance extracted (AVE) is greater than 0.5.

Table 1: Convergent Validity

Variable	Item	Loading	CR	AVE	R2
Confirmation	CONF1	0.923	0.906	0.84	
	CONF2	0.915			
	CONF3	0.912			
Perceived Usefulness	PU1	0.908	0.944	0.856	0.786
	PU2	0.945			
	PU3	0.906			
	PU4	0.938			
Perceived Ease of Use	PEU1	0.895	0.926	0.811	
	PEU2	0.923			
	PEU3	0.866			
	PEU4	0.917			
Satisfaction	SAT1	0.941	0.943	0.898	0.746
	SAT2	0.959			
	SAT3	0.944			
Attitude	ATT1	0.942	0.939	0.890	0.763
	ATT2	0.943			
	ATT3	0.944			

Intention to Continue use E-Wallet	INT1	0.902	0.45	0.855	0.689	
	INT2	0.954				
	INT3	0.937				
	INT4	0.905				

Whereas for the discriminant validity test, the HTMT value needs to exceed 0.90, as recommended by Gold et al. (2001). Table 2 shows no issues for all the values that have been accessed. An analysis using Fornell C & David (1981) was also conducted to test discriminant validity. All the values in Table 3 show no issues in this test, and it passes the required level.

Table 2: HTMT Ratio of Correlations

	1	2	3	4	5	6
Attitude						
Confirmation	0.810					
Intention To Continue Use	0.877	0.814				
Perceived Ease of Use	0.801	0.865	0.799			
Perceived Usefulness	0.825	0.854	0.797	0.890		
Satisfaction	0.866	0.866	0.816	0.860	0.846	

Table 3: Fornal & Lacker Result

	1	2	3	4	5	6
Attitude	0.930					
Confirmation	0.734	0.903				
Intention To Continue Use	0.811	0.739	0.906			
Perceived Ease Of Use	0.733	0.778	0.733	0.881		
Perceived Usefulness	0.767	0.778	0.742	0.841	0.911	
Satisfaction	0.796	0.78	0.751	0.783	0.781	0.923

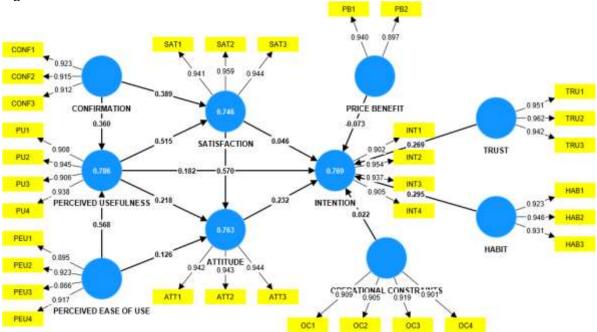
Once the measurement model's validity and reliability were established, PLS-SEM was utilised to examine the theorised connections between the variables. Researchers aim to test hypotheses, understand path coefficients, validate the theoretical model, and generate insights for any decision-making by conducting structural model analysis. Table 4 shows the result of hypotheses testing for the research study model.

Table 4: Result of Hypotheses Testing

Нуро	Path	Std. Beta	Std. Dev	t-value	p-value	PCI LL	PCI UL	Result	f2
H1	ATT -> INT	0.498	0.047	10.576	p<0.001	0.308	0.308	Accepted	0.261
H2	CON -> PU	0.312	0.036	8.745	p<0.001	0.16	0.16	Accepted	0.151
Н3	CON -> SAT	0.437	0.039	11.199	p<0.001	0.275	0.275	Accepted	0.24
H4	PEOU -> ATT	0.098	0.052	1.882	P<0.003	-0.086	0.001	Rejected	0.008
Н5	PEOU -> PU	0.598	0.033	18.028	p<0.001	0.456	0.567	Accepted	0.555
Н6	PU -> ATT	0.315	0.053	5.917	p<0.001	0.067	0.067	Accepted	0.081
H7	PU -> INT	0.212	0.042	5.007	p<0.001	0.04	0.04	Accepted	0.051
Н8	PU -> SAT	0.441	0.039	11.372	p<0.001	0.293	0.293	Accepted	0.244
Н9	SAT -> ATTI	0.473	0.04	11.708	p<0.001	0.318	0.318	Accepted	0.243
H10	SAT -> INT	0.189	0.041	4.589	p<0.001	0.016	0.016	Accepted	0.036

Table 4 shows a significant positive relationship between attitude and intention to continue use (β =0.498, t=10.576, p<0.001). Secondly, a significant positive relationship between confirmation and perceived usefulness (β =0.312, t=8.745, p<0.001) is found. Thirdly, confirmation also shows a significant positive association with satisfaction (β =0.437, t=11.199, p<0.001). Fourthly, the relationship between perceived ease of use and attitude is insignificant (β =0.098, t=1.882, p<0.003). Additionally, a significant positive association exists between perceived ease of use and perceived usefulness (β =0.598, t=18.028, p<0.001). Moreover, perceived usefulness significantly impacts attitude (β =0.315, t=5.917, p<0.001). Furthermore, perceived usefulness is a strong predictor of continued use. (β =0.212, t=5.007, p<0.001). Additionally, perceived usefulness is significantly associated with satisfaction (β =0.441, t=11.372, p<0.001). Lastly, satisfaction exhibits a significant positive impact on attitude (β =0.473, t=11.708, p<0.001) and intention to use (β =0.189, t=4.589, p<0.001). In summary, nine out of ten of the hypothesised relationships are supported by the data, except for the relationship between perceived ease of use and attitude, which was insignificant. Figure 1 shows the path coefficient of the study structural model.





Discussion: This study employed the TCT to explore the factors influencing e-wallet adoption and continued use among university students. Our findings reveal that attitude, perceived usefulness, and confirmation significantly impact students' intention to keep using e-wallets. University students with a positive attitude towards e-wallets, likely due to their perceived convenience, security, and user-friendliness, are likelier to continue using them. This aligns with previous research by Weng et al. (2017) and Wu & Chen (2017). This indicates that a positive attitude towards e-wallets is a crucial predictor of students' intention to use them. The favourable perception of e-wallets may be attributed to their convenience, security, and user-friendly interfaces, which have likely contributed to their widespread adoption among this demographic. This aligns with the perceived convenience, security, and user-friendliness often associated with e-wallets, making them attractive to students. Furthermore, confirmation of usefulness strengthens users' trust and perceived value, leading to higher satisfaction and, ultimately, continued use, consistent with the findings by Alraimi et al. (2015), Bhattacherjee (2001), Oliver (1980) and Venkatesh et al. (2011).

Students who perceive e-wallets as beneficial tend to develop a more positive attitude towards them, highlighting the interplay between these constructs. When users perceive e-wallets as beneficial, they are more likely to experience higher satisfaction with the technology. This positive experience will enhance their intention to continue using e-wallets. Interestingly, ease of use did not directly influence attitude. This suggests that factors like convenience and perceived usefulness might be more important for young users. While ease of

use remains valuable, a user-friendly interface might be a baseline expectation for young consumers. Their decision to continue using e-wallets likely hinges more on the perceived value and practical benefits they offer, which deviates from the findings of Ariffin and Lim (2020) and suggests a potential generational shift in user priorities. Additionally, the research confirms a strong, positive correlation between perceived ease of use and perceived usefulness of e-wallets, aligning with Sinha et al. (2019). Students are drawn to e-wallets due to their intuitive interface and streamlined functionality. This focus on simplicity and efficiency caters to the preferences of young users who value a smooth and trouble-free payment experience.

As a result, the ease of use directly impacts their perception of the technology's overall usefulness. Moreover, perceived usefulness impacts attitude significantly, supporting the findings of Kustono et al. (2020). This finding suggests that users who perceive e-wallets as highly useful are likelier to have a positive attitude toward the technology. The benefits, such as quick transactions and cashless convenience, foster a cheerful disposition among university students. When students perceive e-wallets as valuable and practical tools, they are more likely to feel satisfied with their overall payment experiences. This positive relationship reinforces that users' satisfaction is closely linked to their perception of the technology's usefulness. Finally, this study confirms that user satisfaction significantly influences positive attitudes and intention to keep using e-wallets. This finding echoes prior studies by Foroughi et al. (2019), Rahi et al. (2021) and Shang & Wu (2017). When university students are satisfied with their e-wallet experiences, they are likelier to maintain a positive attitude towards the technology and exhibit a strong intention to continue using it. Satisfaction is key to cultivating favourable attitudes and fostering future usage intentions.

Contribution and Implications: This research contributes to the understanding of e-wallet adoption in two key ways. Firstly, it demonstrates the continued relevance of the TCT model in explaining young consumers' technology adoption behaviour. This reinforces the TCT's usefulness in understanding user continuance intentions within the context of e-wallets. Secondly, the study highlights the factors influencing university students' attitudes and intentions towards e-wallets. This knowledge is valuable for researchers exploring technology adoption among young demographics. Furthermore, from a policy perspective, this research suggests that promoting positive user experiences with e-wallets can encourage cashless transactions among young adults. This aligns with the government and Bank Negara Malaysia's initiatives to promote cashless societies. Universities can also leverage these findings to facilitate smoother payment processes by encouraging student e-wallet adoption.

5. Conclusion and Recommendations

This study achieved its research objective by providing valuable insights into the determinants of e-wallet payment usage among university students. The results indicate that all proposed hypotheses except one were not supported. The findings contribute to applying the TCT, particularly new knowledge within the context of e-wallet literature. Theoretical implications contribute to knowledge development, while the practical implications extend to consumers and the e-wallet industry, benefiting key players in this area. This research investigates the direct relationships between confirmation, perceived usefulness, perceived ease of use, satisfaction, and attitude toward the intention to continue using e-wallets. For a more comprehensive understanding, future studies could explore additional variables as moderating factors, such as gender, to ascertain whether different genders might impact the intention to continue using e-wallets. It should be noted that most of the research participants are from younger generations from public universities. Hence, the outcome can only be broadly generalised to some of the population. Moreover, it should be mentioned that this study employs a cross-sectional approach, meaning that data is collected only at one specific moment. A longitudinal study would be more beneficial given the study's emphasis on continuance intention. This way, changes in respondents' intentions can be observed, leading to more generalised results.

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