

## **Do Filipinos Transact Less in Cash Post-COVID? Analyzing Consumers' Intent to Continue Using Mobile Wallets**

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### **ABSTRACT**

Filipinos have been quick to embrace mobile wallets. It was during the COVID-19 crisis that the use of mobile wallets as payment options took off. With concerns about money potentially carrying the virus, many Filipinos turned to mobile wallets for safer transactions. However, little is known about what motivates consumers to adopt and stick with mobile wallet usage. This study aims to explore the factors that influence mobile wallet usage by employing the Expectation-Confirmation Model as a framework with a focus on perceived health risks. A survey was conducted with 391 Filipino participants. Analysis was performed using SEM and mediation analysis techniques. The findings revealed that confirmation, user satisfaction, perceived usefulness, and perceived health risk all play roles in determining users' intention to continue using mobile wallets. However, mediation analysis showed that user satisfaction does not mediate the relationship between perceived health risk and continuance intention. This study advances the existing literature on mobile wallet usage and enhances the understanding of ECM by integrating the concept of perceived health risks into its framework. The findings offer practical implications for FinTech companies, banks, businesses, and health professionals, recommending strategies to promote mobile wallets as a safer payment alternative.

**Keywords:** Mobile Wallets, Continuance Intention, Extended Expectation-Confirmation Model (ECM), Perceived Health Risks.

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## **1. INTRODUCTION**

The World Health Organization (WHO), in March 2020, officially recognized the severity of the escalating crisis and declared COVID-19 a pandemic (WHO, 2020). This announcement resulted in an unprecedented shift in the dynamics of everyday life as it triggered a series of extensive transformations around the globe. Nearly all countries enacted stringent health measures to contain and mitigate the threats of viral transmission, and the Philippines was no exception. Its national government embarked on a course of action leading to the implementation of rigorous quarantine protocols. These measures not only limited public mobility but also allowed access to only vital goods and services (Talabis et al., 2021). Consequently, the naturally resilient and adaptive Filipinos found themselves traversing a changing landscape necessitating the exploration and adoption of novel ways of conducting daily and occasional activities to cope with the new normal. As at the time human contact could potentially be life-threatening, traditional modes of shopping and buying dramatically changed. The confinement imposed by quarantine measures amplified

the need for remote methods of accessing commodities and services. As such, many Filipinos embraced online platforms as a lifeline for their daily needs. From groceries to essentials, consumers turned to online shopping platforms and delivery services, opting for a contactless experience to minimize the risk of infection. Moreover, the subsequent rise in digital payments emerged as a compelling manifestation of the pandemic's far-reaching impact on societal norms.

Even though e-commerce was already a familiar phenomenon, it was during this unprecedented era of social disruption and transformation that a significant segment of the Filipino population began to harness its full potential. A substantial 52% of Filipinos engaged in online shopping through applications and websites for the very first time, as revealed in the Consumer Payment Attitudes study commissioned by Visa in October 2020 (Visa, 2021). This trend not only demonstrated the adaptability of Filipinos in responding to the challenging pandemic conditions but also signified a noteworthy shift in their consumer behavior.

Further corroborating this trend was a notable increase in online consumer goods purchases and online food delivery utilization between 2020 and 2021. These statistics, as indicated by Kemp (2022), pointed towards a substantial surge of 11.4% in online consumer goods purchases and an even more significant increase of 20.1% in online food delivery services. These figures unmistakably illustrated a radical shift in purchasing behavior, a direct result of the unprecedented conditions imposed by the pandemic. The enforced isolation coupled with the continuous threat of infection effectively nudged consumers towards online platforms as a convenient and safer avenue for procuring goods and services.

With these profound shifts in societal behavior came an array of emerging concerns. Chief among these were apprehensions about the potential for COVID-19 transmission through the handling of physical currency, a traditionally ubiquitous medium of exchange (Auer et al., 2020; R. Pal & Bhadada, 2020). While scientific data suggested a relatively low probability of transmission through this medium, the fear and uncertainty surrounding the novel virus led to a perceptible shift towards safer alternatives. Digital payments, previously perceived as a convenient option, suddenly became a critical tool for ensuring personal safety in an increasingly uncertain world.

Emerging and developing economies, including the Philippines, advocated for the widespread adoption of digital payments, leveraging their inherent contactless nature to alleviate concerns about viral transmission (Auer et al., 2020). Notably, recent studies by Sreelakshmi & Prathap (2020) and Daragmeh et al. (2021) bolstered this proposition by highlighting mobile-based payments as a safer and more secure alternative for transaction processing. The fear of contagion, coupled with the ease of digital transactions, effectively facilitated the transition from traditional payment methods to digital platforms.

While the Philippine society was introduced to digital payments as early as 2001, the widespread adoption of these technologies only occurred during the period of pandemic lockdowns, where in just 18 months, the use of e-wallets for financial transactions in the Philippines rocketed from a mere 3% to a substantial 40% (Mina, 2022). Notably, mobile wallets emerged as a popular choice among Filipinos, indicating overwhelming acceptance and readiness to shift towards a more digital-centric mode of transaction. Proof to this trend was the dramatic increase in financial transactions through e-wallets. An overwhelming 73% of Filipinos expressed a preference for contactless payment, citing its hygienic nature and absence of physical interaction as key reasons (VISA, 2021).

Now that the COVID-19 is no longer recognized as a global health crisis according to WHO (WHO Chief Declares End to COVID-19 as a Global Health Emergency, 2023), it remains a question whether people will continue using mobile wallets or shift back to the

use of cash and credit/debit card transactions. Wisniewski et al. (2021) saw a trend toward an enduring preference for cashless payments, suggesting that the societal transformations instigated by the pandemic are too great that they may already have a lasting impact on consumer behavior, extending far beyond the pandemic's duration.

This trend may not necessarily be true for the Philippines, which had a very slow adoption of mobile wallets pre-pandemic. Thus, the question, "Will Filipino consumers continue to rely heavily on mobile wallets once the pandemic is eventually subdued? Or will there be a reversal and Filipinos will go back to the traditional forms of transaction?" To answer this, the researchers believe there's a need to probe deeper into the factors that motivate Filipino consumers to adopt and persist in using mobile wallets. A comprehensive understanding of these factors will not only provide critical insights into the evolving consumer landscape but also help in devising strategies to foster the sustainable growth of digital payment systems today. Furthermore, it will deepen our comprehension on the role of perceived health risk on mobile wallet usage, a concept that may hold relevance for consumers worldwide.

## 2. LITERATURE REVIEW

Mobile phones started as basic means of communication but have since evolved into essential tools supporting many facets of everyday life in today's technologically driven world. Almost 67% of the global population utilizes this handheld gadget (Kemp, 2022), which has prompted the development of mobile technology-based business solutions. One prominent example of this trend is the mobile wallet.

A mobile wallet as the "new form of mobile payment that enables users to share content, access services, as well as conduct payments and ticketing transactions" (Shin, 2009, p. 1344). Essentially, it is a digital incarnation of the conventional wallet housed within a smartphone as an application. This modernized wallet provides advanced functionalities such as storage of personal data, credit card details, PIN codes, booking information, and membership cards, among others (Shin, 2009).

The COVID-19 pandemic played a pivotal role in driving this growth and accelerating the shift to mobile payments as an important means to sustain commercial and social activities (World Bank, 2020). In the Philippines, it is anticipated that mobile wallet users will reach 75.5 million by 2025 (Mina, 2022). Recognizing the potential of this digital revolution, the country's central bank fostered the use of innovative digital payment solutions (BSP, 2020).

The increase in the use of mobile wallets has motivated a great deal of research, predominantly focusing on the reasons behind their adoption. Ly et al. (2022) identified factors such as performance expectancy, hedonic motivation, facilitating conditions, trust, habit, and price-saving orientation significantly influencing the continued use of mobile wallets in Vietnam. Similarly, Lew et al. (2020) determined that usefulness, ease of use, self-efficacy, and perceived enjoyment are significant predictors of mobile wallet adoption among customers in the hospitality industry. On the other hand, Sarmah et al. (2021) stressed the importance of mobile wallets being perceived as trustworthy technologies/services to guarantee their widespread use.

While it pays to recognize the factors driving mobile wallet usage, understanding the potential barriers that could prevent their widespread use is also important. Several researchers have investigated the adverse impacts of perceived risk on the intention to utilize mobile payments, taking into account factors such as time, financial concerns, privacy issues, performance, and psychological aspects (de Kerviler et al., 2016). Research on the

perceived health risk relating to the continuous intention to use mobile wallets has increased since the start of the pandemic (Aji et al., 2020; Daragmeh et al., 2021; Sreelakshmi & Prathap, 2020). Notably, a study by Tu et al. (2022) utilized social learning theory to illustrate how external interaction with the environment and psychological processes shaped consumer behavior towards QR code mobile payments, positing that mobile payments could serve as both a utilitarian tool and a health safeguard.

Despite the breadth of research on mobile wallets, there is a conspicuous dearth of studies investigating the impact of perceived health risk, particularly in the Filipino context. Given that a considerable 88% of Filipinos express interest in utilizing contactless payments in the future (Visa, 2021), it becomes imperative to study their payment behavior to ensure the successful usage of mobile wallets beyond the COVID-19 crisis. Furthermore, adopting mobile payments is viewed as a viable strategy to conform to social distancing policies (Sreelakshmi & Prathap, 2020).

In this context, the paper aims to explore the factors that influence the sustained usage of mobile wallets. With the inclusion of perceived health risk as a novel construct, this research employs the Expectation-Confirmation Model (ECM) (Bhattacharjee, 2001b) to fully comprehend the underlying drivers of post-adoption behavior of Filipinos concerning mobile wallet usage in this new normal. The anticipated insights from this research will prove invaluable for stakeholders in the FinTech (financial technology) sector in crafting strategies to encourage Filipino consumers to continue using mobile wallets. Consequently, this could potentially pave the way towards realizing a cash-lite economy and mark the beginning of a new chapter in the financial landscape of the Philippines.

## 2.1. Theoretical and Conceptual Frameworks

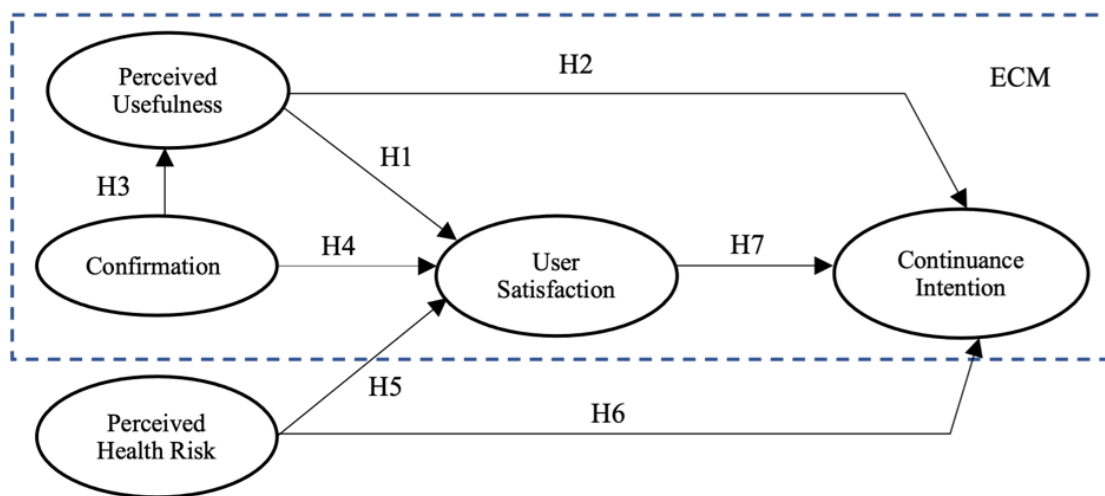
Most research examining technology adoption and usage have utilized theories such as the Technology Acceptance Model (TAM) (Davis, 1986) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). These theories primarily focus on the factors that shape individuals' intention to use a technology. However, these models mostly address the initial acceptance phase, leaving the post-adoption behavior understudied.

Bhattacharjee (2001b) pointed out the need to explore individuals' continuance behaviors – the decisions to continue or discontinue the use of technology – which are just as critical, if not more so, than initial acceptance behaviors. His argument led to the development of the Expectation-Confirmation Model (ECM), a framework derived from the Expectation-Confirmation Theory (ECT) (Oliver, 1980, as cited in Bhattacharjee, 2001b). This model was designed to examine consumers' satisfaction and repurchase intention thoroughly.

The ECT explains the process of how a consumer decides whether or not to repurchase a product or service. It includes a series of steps: the consumer forms an initial expectation before purchasing; forms perceptions about its performance following use; determines if the performance meets, exceeds, or falls short of their expectations; experiences satisfaction or dissatisfaction depending on the confirmation level of expectations; and finally, decides whether to repurchase the product or service based on their degree of satisfaction (Bhattacharjee, 2001b). Despite the ECT being used to analyze consumer behavior in various contexts, Bhattacharjee (2001b) refined the framework to better explain users' continuance decisions in using an information system (IS). He proposed the ECM, which emphasized post-acceptance behaviors as a critical aspect of predicting an individual's continued use of IS.

The ECM argues that prior usage of a product or service generates user expectations that then lead to satisfaction or dissatisfaction and influence the decision to continue its use. It has been applied in different contexts, such as explaining the use of smartwatches (D. Pal et al., 2020), digital textbooks (Joo et al., 2017), paid mobile apps (Hsu & Lin, 2015), and e-learning (Lee, 2010). The ECM has shown its effectiveness as a framework for understanding post-usage expectations for products and services that frequently innovate their features and designs (Bhattacharjee, 2001b; D. Pal et al., 2020). Therefore, in our study, we will extend the ECM with the construct of perceived health risk (Figure 1), given its relevance and its impact on user behavior, particularly concerning the use of mobile wallets.

Figure 1. Hypothesized Framework



## 2.2. Hypothesis Development

### 2.2.1. Perceived Usefulness

Perceived Usefulness (PU) plays a pivotal role in the Expectation-Confirmation Model (ECM). Davis (1989, p. 320) defined PU as "the degree to which a person believes that using a particular system would enhance his or her job performance." This belief holds particular significance because it impacts user satisfaction (US) and continuance intention (CI), especially when the user interacts with complex systems, such as digital platforms or applications (Bhattacharjee, 2001b).

In the context of mobile wallets, users tend to feel satisfied and inclined to keep using the app if they find it helpful for their daily transactions. Previous studies like those by Oghuma et al. (2016) and D. Pal et al. (2020) have illustrated that when users identify tangible benefits from using a product or service, they exhibit higher satisfaction levels and are more likely to continue using it.

However, empirical research has yielded contradictory results. Some studies have found that while PU significantly affects user satisfaction, it does not directly impact the continuance intention (Ayanso et al., 2015; Franque et al., 2021). Users may perceive a technology as useful but might still opt to discontinue its use due to other factors such as lack of trust, high perceived risk, or poor user experience.

Despite these mixed findings, PU remains a central construct in technology adoption models and is considered highly relevant across various stages of IS use (Bhattacharjee, 2001b; Venkatesh et al., 2003). Its influence on user satisfaction and continuance intention

cannot be ignored, particularly when analyzing the adoption of innovative technologies like mobile wallets.

In light of these considerations and to investigate the role of PU within the context of mobile wallet adoption in the Philippines, this study proposes the following hypotheses:

**H1:** Perceived usefulness positively influences user satisfaction with mobile wallets.

A positive perception of the utility of mobile wallets is likely to enhance the user experience, leading to higher satisfaction. Users who perceive the technology as beneficial in improving their daily transactions are more likely to be satisfied with its performance.

**H2:** Perceived usefulness positively influences the continuance intention to use mobile wallets.

Users who perceive mobile wallets as useful are more likely to develop a continued intention to use the technology. The perceived utility of the mobile wallet can instill a positive attitude towards the technology, leading to a stronger inclination to continue its use.

The inclusion of these hypotheses will allow this research to contribute to the existing body of literature by providing a nuanced understanding of the role of perceived usefulness in influencing user satisfaction and continuance intention within the context of mobile wallet adoption in the Philippines. It will also offer valuable insights for service providers on the importance of enhancing the perceived usefulness of their platforms to foster user satisfaction and promote continued use of their service.

### 2.2.2. Confirmation

The concept of confirmation (CO) is integral to understanding the user experience, specifically in terms of how the actual performance of a technology aligns with users' initial expectations. Individuals who decide to use a particular system carry a set of expectations regarding the system's performance. Upon interacting with the system, users can compare their initial expectations with their actual experiences, which gives them a sense of confirmation or disconfirmation.

Positive confirmation occurs when the performance of a product or service exceeds users' initial expectations. This scenario usually leads to higher user satisfaction (Bhattacharjee, 2001b; D. Pal et al., 2020) and can positively influence perceived usefulness, reinforcing the idea that the system serves their needs effectively (Ayanso et al., 2015; Gu et al., 2018; Lee, 2010). Conversely, if users' expectations are not met or negatively confirmed, this discrepancy may induce lower user satisfaction.

While confirmation has been discussed in a general sense, its implications are particularly relevant in the context of mobile wallet technologies. Users approach mobile wallets with specific expectations regarding ease of use, convenience, efficiency, and security. The degree to which these expectations are confirmed or disconfirmed may considerably influence users' satisfaction levels and the technology's perceived usefulness.

Additionally, given the rapid evolution of mobile wallet technologies, with continuous updates and feature additions, the role of confirmation may be even more prominent. Users' perceptions about these technologies are often dynamic and shaped by their evolving experiences. As such, confirmation serves as a critical mediator in shaping users' experiences with mobile wallet technologies over time.

In light of this discussion, the following hypotheses is proposed by this study:

**H3:** Confirmation positively influences perceived usefulness in the context of mobile wallet technologies.

Users who experience positive confirmation (i.e., their expectations on the use of mobile wallets are met or exceeded) are likely to perceive the technology as more useful.

This perception may foster a positive attitude toward mobile wallet technologies, driving their continued use.

**H4:** Confirmation positively influences user satisfaction with mobile wallets.

Positive confirmation likely boosts user satisfaction, as users who find that mobile wallets exceed their expectations are more likely to be satisfied with the technology. In contrast, negative confirmation (i.e., the technology falls short of expectations) can lead to dissatisfaction.

These hypotheses will contribute to the current literature by elucidating the role of confirmation in shaping users' perceived usefulness and satisfaction toward mobile wallet technologies. Furthermore, they will offer practical insights to service providers about the necessity of meeting user expectations to foster continued use of their platforms.

### *2.2.3. Perceived Health Risk*

Traditionally, perceived risk is regarded as a deterrent to user technology adoption. The potential negative outcomes, whether financial, performance-related, or security breaches, generally result in users' reluctance to adopt new technologies (Featherman & Pavlou, 2002). However, the emergence of the COVID-19 pandemic has altered the usual understanding of perceived risk, particularly by introducing a new facet of risk - the perceived health risk.

Perceived health risk is the individual's belief in the possibility of adverse health effects from engaging in a particular activity. Interestingly, in the context of the pandemic, perceived health risk seems to encourage rather than hinder the adoption of technologies. Dou et al. (2017) found that perceived health threat predicts the intention to use a smartphone health technology by patients with chronic diseases. Alaiad et al. (2019) analyzed data from 280 patients and concluded that patients are willing to use the M-Health app if they perceive it to lessen health threats. While Aji et al. (2020) reported that the intention to use e-wallets of consumers from Indonesia and Malaysia is determined by their perceived risk of COVID-19. To wit, these studies revealed that technology or service would be most likely used if a user perceives it to prevent a potential health threat.

Since mobile wallets are contactless payment systems, adoption has increased as people perceive them as less risky in terms of potential virus transmission compared to traditional cash transactions (Sreelakshmi & Prathap, 2020). Research suggests that perceived health risk has positively impacted the adoption and continued use of technologies that reduce direct in-person interaction, such as mobile wallets.

Given these insights, it is pertinent to investigate the role of perceived health risk in shaping user attitudes and behavior towards mobile wallet technologies. Thus, the following hypotheses are put forth:

**H5:** Perceived health risk positively influences user satisfaction with mobile wallet technologies.

Individuals who perceive mobile wallets as a safer alternative, health-wise, are likely to experience greater satisfaction due to the reduced health risks related to their use.

**H6:** Perceived health risk positively affects the continuance intention to use mobile wallets.

The perceived reduction in health risks associated with using mobile wallets can also contribute to users' intentions to continue using these technologies.

### *2.2.4. Satisfaction as a Determinant of Continuance Intention*

User satisfaction, a reflection of users' cognitive feelings resulting from interaction with a product or service, is of paramount importance in shaping user behavior, particularly in terms

of continued usage (Bhattacharjee, 2001b). This emotional response, ranging from positive (satisfied) to negative (dissatisfied), generally results from the dissimilarity between prior expectations and perceived performance.

In his study, Bhattacharjee (2001b) identified satisfaction as the strongest predictor of actual continuance behaviors. Likewise, findings from previous studies validated satisfaction as a salient determinant to ensure consumers' continuance intention to use various technologies such as EMR systems (Ayanso et al., 2015); mobile instant messaging (Oghuma et al., 2016); mobile apps (Tam et al., 2020); smartwatches (D. Pal et al., 2020); and m-payment (Franque et al., 2021).

Satisfaction shapes user behavior by guiding their evaluative judgment about the technology. A satisfied consumer will likely continue to use that particular product or service, helping it succeed and last in the market. Satisfaction is both an endpoint, resulting from previous consumption experiences, and a starting point, influencing future usage intentions and behaviors (Bhattacharjee, 2001b).

Notably, in the mobile wallet context, satisfaction could emanate from many sources, such as ease of use, transaction speed, and safety, and can significantly influence users' decisions to continue using these services. Furthermore, considering the pandemic, the satisfaction derived from reduced perceived health risk could also play a vital role in continuance intention.

Therefore, in alignment with the existing literature and given the importance of user satisfaction, the following hypothesis is proposed:

**H7:** User satisfaction positively influences the continuance intention to use a mobile wallet.

By testing this hypothesis, the study seeks to fully understand the role of user satisfaction in determining continuance intention in the mobile wallet sector. The insights from this analysis can help mobile wallet providers improve their services, thereby enhancing user satisfaction and encouraging continued use.

### 3. METHODOLOGY

The study employed a descriptive-causal research design while utilizing the survey methodology to investigate if user satisfaction mediates the effects of perceived usefulness, confirmation, and perceived health risk on the continuance intention of using mobile wallets. To maintain the study's robustness and enhance its content validity, the research instrument utilized in this investigation is predicated on measurements extracted from extant relevant literature. These measures, while borrowed from prior studies, were subtly tailored to suit the context of this investigation, ensuring the relevance and applicability of the constructs under investigation: perceived usefulness, confirmation, perceived health risk, user satisfaction, and continuance intention.

Following Dawes (2008), a five-point Likert scale was utilized for item responses, ranging from "1 = strongly disagree" to "5 = strongly agree." The adoption of this ordinal scale method is underpinned by its widespread acceptance and success in capturing attitudes and perceptions toward products, services, or concepts. It offers a straightforward approach for respondents, enabling them to express their degree of agreement or disagreement with the posed statements, thereby ensuring the accuracy and reliability of the collected data.

This study employs a series of questions aimed at discerning participants' attitudes and perceptions toward several core constructs, each related to the use and adoption of mobile wallet services.



Data was collected via an online survey, a quick, easy-to-use, and cost-effective data collection method during this COVID-19 period (Singh & Sagar, 2021). Before the actual survey, a pilot survey was administered to 103 respondents to determine the validity and reliability of the measures, including if the questions could be easily understood. From the pilot survey results, necessary modifications were applied to the survey instrument. Convenience sampling was employed to select the target sample, which should be experienced mobile wallet users aged 18 years and above. A survey link was created and sent to the target sample via their social media accounts. The researchers requested them to forward the link to others, causing a "snowball" effect. Likewise, the survey link was posted on social media platforms (e.g., Facebook), which increased the possibility of reaching current mobile wallet users as respondents (Jaiswal et al., 2022). After three weeks of data collection, the survey link was deactivated.

Table 1. Constructs used in the model

Constructs	Items	Reference
Perceived Usefulness (PU)		
PU1	Using mobile wallet services is useful to me.	Valencia et al. (2021)
PU2	Using mobile payment services will make payments, such as bills, faster and easier.	
PU3	Mobile payment service is convenient and will improve my work and life efficiency.	
Confirmation (CO)		
CO1	My experience with using my mobile wallet was better than what I expected.	Bhattacharjee (2001b)
CO2	My mobile wallet gives me a level of service better than what I expected.	
CO3	Overall, most of my expectations from using my mobile wallet were confirmed.	
Perceived Health Risk (PHR)		
PHR1	I am worried to get infected by coronavirus when using physical cash.	Aji et al. (2020)
PHR2	I am not comfortable making payment using physical cash.	
PHR3	I am afraid to get infected by coronavirus when using physical cash.	
PHR4	I am worried that droplets of COVID-19 virus are present in physical cash.	
User Satisfaction (US)		
US1	I feel satisfied with mobile wallet usage.	Bhattacharjee (2001a)
US2	I feel content with my mobile wallet usage.	
US3	I feel happy using mobile wallet services.	
Continuance Intention (CI)		
CI1	I intend to continue using a mobile wallet.	Bhattacharjee (2001b)
CI2	My intention is to continue using mobile wallet rather than use any alternative means (e.g., credit card, cash)	
CI3	I will not discontinue my use of mobile wallets.	

In total, 425 respondents answered the online survey. Of these, 391 valid responses were used as the final dataset after data clean-up (removal of incomplete and invalid

answers). There were slightly more female respondents (54.48%) than male respondents (45.52%). Most respondents were between 21 to 30 years old (45.01%), owned 2 to 3 mobile wallets (41.18%), and used the mobile wallet 2 to 5 times a week (45.27%). Table 2 summarizes the socio-demographic characteristics of the respondents.

Table 2. Characteristics of the Respondents

Characteristics		Frequency	Percentage (%)
Gender at Birth	Male	178	45.52
	Female	213	54.48
Age	18 – 20 years old	85	21.74
	21 – 30 years old	176	45.01
	31 – 40 years old	79	20.21
	41 – 50 years old	39	9.97
	above 50 years old	12	3.07
No. of mobile wallets used	Only 1	140	35.81
	2 – 3	161	41.18
	4 – 5	65	16.62
	6 or more	25	6.39
Frequency of use	Once a week	117	29.92
	2 – 5 times a week	177	45.27
	6 – 9 times a week	47	12.02
	10 – 13 times a week	12	3.07
	14 times a week or more	38	9.72

A multivariate analysis of variance (MANOVA) was used to determine if there were significant variations in the linear combination of PU, HR, CONT, US, and CI between the ages, genders, and number of mobile wallets. The main effect for Gender [ $F(5, 378) = 2.66, p = .022, \eta^2_p = 0.03$ ] and Number of mobile wallets used were significant [ $F(15, 1140) = 1.76, p = .035, \eta^2_p = 0.02$ ], suggesting the linear combination of PU, HR, CONT, US, and CI was significantly different between the levels of Gender and Number of mobile wallets. While, the main effect for Age was not significant,  $F(20, 1524) = 1.36, p = .129, \eta^2_p = 0.02$ . The MANOVA results are presented in Table 3.

Table 3. MANOVA Results for PU, HR, CONT, US, and CI by Age, Sex, and Number of Mobile Wallets

Variable	Pillai	<i>F</i>	<i>df</i>	Residual <i>df</i>	<i>p</i>	$\eta^2_p$
Sex	0.03	2.66	5	378	.022	0.03
M_Wallet	0.07	1.76	15	1140	.035	0.02
Age	0.07	1.36	20	1524	.129	0.02

While the main effect for gender was significant, the authors were able to control this variable as the number of respondents from both genders is comparable, with slightly more on the side of females like in the population in the Philippines. By ensuring that the distribution of these control variables is representative of the current statistics, our study can confidently present the findings as broadly applicable to the population of mobile wallet users. This enhances the external validity of our study and allows us to understand more the influence of perceived usefulness, confirmation, perceived health risk, and user satisfaction on continuance intention.

## 4. RESULTS

### 4.1. Descriptive statistics

The table below presents the mean and standard deviation of all constructs. Data showed that respondents answered positively to the research constructs since all mean scores were greater than 3.0. Moreover, the reliability of the constructs was tested using Cronbach's Alpha. As presented in Table 4, the Cronbach's Alpha values of each construct exhibited excellent ( $0.9 \leq \alpha$ ) to acceptable ( $0.7 \leq \alpha < 0.8$ ) internal consistency; that is, the constructs reliably measured what they needed to measure (Zach, 2020).

Table 4. Descriptive statistics and Cronbach's Alpha

Constructs	Mean	Std. Dev.	95% Confidence Interval		Cronbach's $\alpha$
			Lower	Upper	
Perceived Usefulness	4.65	0.501	4.60	4.70	0.88
Confirmation	4.23	0.619	4.17	4.29	0.91
Perceived Health Risk	3.22	0.994	3.12	3.32	0.92
User Satisfaction	4.29	0.612	4.22	4.35	0.92
Continuance Intention	4.18	0.631	4.11	4.24	0.70

The survey results provided an understanding of the respondents' perceptions of the various constructs. For Perceived Usefulness, the mean score was 4.65 out of 5, suggesting that respondents generally found the use of mobile wallets highly beneficial. The low standard deviation of 0.501 indicates that the answers were relatively concentrated around the high mean value. With 95% confidence, it can be estimated that the mean perceived usefulness of the population will be somewhere between 4.60 to 4.70, supporting the idea that people see mobile wallets as something useful. For Confirmation, a mean score of 4.23 and a standard deviation of 0.619 were recorded. The moderate dispersion in responses indicates that while customers' experiences with mobile wallets are in line with initial expectations, they feel strongly about it in varying degrees. With 95% CI [4.17, 4.29], the worst-case and best-case scenarios indicate that the mean rating will be interpreted as people feel the performance of mobile wallets aligns with their initial expectations. Meanwhile, Perceived Health Risk obtained the lowest mean score of 3.22 signifying that, on average, respondents were moderately concerned about the health risks associated with physical cash use during the COVID-19 pandemic. It also recorded the highest standard deviation of 0.994, implying a more diverse range of responses compared to other constructs indicating that some still feel that there are health risks involved in physical transactions, while there are some who feel that there are already none. The 95% CI [3.12 to 3.32] provides an estimate of the true population mean indicating neutrality. This supports the notion that after WHO declared COVID-19 a pandemic no more, people do not see physical transactions in purchasing goods as a big threat anymore, although there's still some level of caution and care in doing so. On the other hand, User Satisfaction got an average score of 4.29 suggesting that respondents were satisfied with their mobile wallet usage. A 0.612 standard deviation indicates a moderate dispersion of responses around the mean implying that the bulk of respondents feel either satisfied or very satisfied using mobile wallets. The 95% CI [4.22, 4.35] population mean estimate supports the same. As for Continuance Intention, the mean score of 4.18 shows a strong intention among respondents to continue using mobile wallets. However, the standard deviation of 0.631 illustrates a moderate spread of responses around the mean. This implies that many feel like continuing the use of mobile wallets while only some feel strongly about it. The 95% CI [4.11, 4.24] provides a reliable estimate of the mean and indicates customers are likely to continue using mobile wallets.

## 4.2 Structural model

In the rich and dynamic field of marketing and management research, most studies on ECM have harnessed the analytical prowess of Structural Equation Modeling (SEM) to elucidate the interrelationships between various constructs (Ayanso et al., 2015; Feng & Jantarakolica, 2023; Gu et al., 2018). Recognized as a quasi-standard technique, SEM enables the measurement of causal relationships between distinct constructs (Hair et al., 2011). This study employed PLS-SEM to evaluate the significance and elucidate the variance explained ( $R^2$ ) of each proposed path.

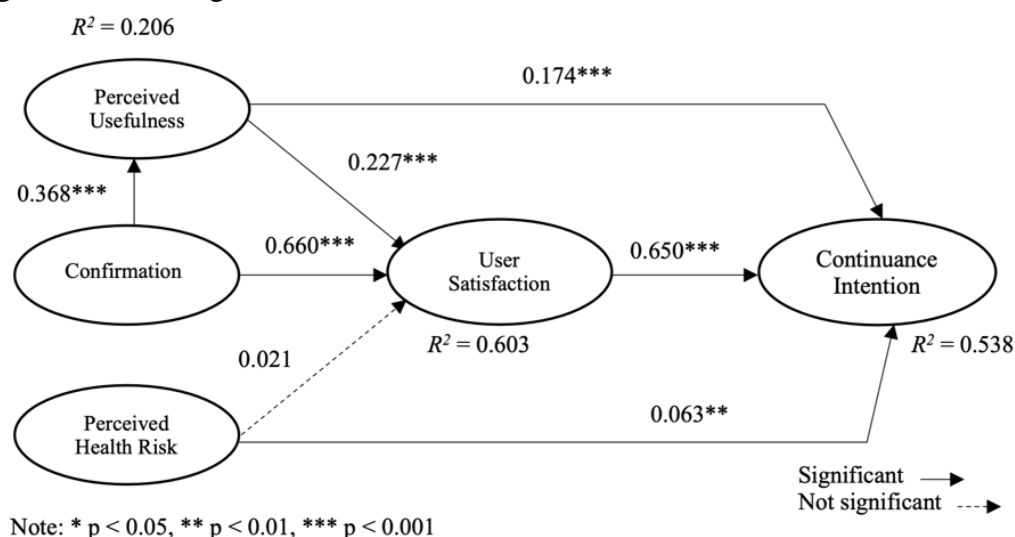
Table 5 presents the results of hypotheses testing conducted within this study, while Figure 2 illustrates the path analysis. In summary, six out of seven hypotheses were statistically supported by the data, with only Hypothesis 5 not gaining support.

Table 5. Summary of hypotheses tests

Hypothesis	Estimate (B)	SE	p-Value	95% Confidence Interval		Result	
				Lower	Upper		
H1	PU → US	0.227	0.044	< .001	0.141	0.312	Supported
H2	PU → CI	0.174	0.050	< .001	0.077	0.272	Supported
H3	CO → PU	0.368	0.036	< .001	0.296	0.439	Supported
H4	CO → US	0.660	0.036	< .001	0.590	0.730	Supported
H5	PHR → US	0.021	0.020	0.295	-0.018	0.060	Not supported
H6	PHR → CI	0.063	0.022	0.005	0.019	0.106	Supported
H7	US → CI	0.650	0.041	< .001	0.570	0.731	Supported

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Figure 2. Node diagram of the PLS-SEM



Assessing the model's predictive prowess, the  $R^2$  values for the endogenous constructs were computed. We found that the confirmation construct explains 20.6% of the variance in the perceived usefulness construct ( $R^2 = 0.206$ ). The constructs of perceived usefulness, confirmation, and perceived health risk accounted for 60.3% of the variance in the user satisfaction construct ( $R^2 = 0.603$ ). Additionally, perceived usefulness, perceived health risk,

and user satisfaction constructs explained 53.8% of the variance in the continuance intention construct ( $R^2 = 0.538$ ). While there's no strict criterion for acceptable  $R^2$  values because it varies depending on the field of study (Hair et al., 2011), Chin's (1998) study in information system research suggests that  $R^2$  values of 0.67, 0.33, or 0.19 can be considered as substantial, moderate, or weak, respectively.

Our analysis didn't stop at exploring direct effects; we delved further to uncover any indirect effects mediated by user satisfaction. As reported in Tables 6, 7, and 8, our mediation analysis conducted via JASP revealed that user satisfaction acted as a partial mediator between perceived usefulness and continuance intention ( $B = 0.055$ ,  $p < 0.001$ , 95% CI [0.026, 0.085]) and between confirmation and continuance intention ( $B = 0.161$ ,  $p < 0.001$ , 95% CI [0.097, 0.225]). This implies that in these relationships, the direct and indirect effects are both important. However, while the direct effect of perceived health risk on continuance intention was significant, its indirect effect through user satisfaction ( $B = 0.005$ ,  $p < 0.305$ , 95% CI [-0.005, 0.015]) is deemed insignificant, indicating that mediation is not supported.

Table 6 presents the direct effects of Perceived Usefulness (PU), Confirmation (CO), and Perceived Health Risk (PHR) on Continuance Intention (CI).

The data revealed that PU has a significant direct effect on CI ( $B = 0.098$ ,  $SE = 0.042$ ,  $p = 0.020$ , 95% CI [0.015, 0.181]). Similarly, CO also demonstrated a significant direct effect on CI ( $B = 0.577$ ,  $SE = 0.046$ ,  $p < 0.001$ , 95% CI [0.487, 0.667]). Finally, PHR also showed a significant direct effect on CI ( $B = 0.042$ ,  $SE = 0.019$ ,  $p = 0.026$ , 95% CI [0.005, 0.079]). These results provide support for the direct relationships between these constructs and Continuance Intention.

Table 6. Direct effects

Effect	Estimate (B)	SE	p-Value	95% Confidence Interval		Result
				Lower	Upper	
PU → CI	0.098	0.042	0.020	0.015	0.181	Supported
CO → CI	0.577	0.046	< .001	0.487	0.667	Supported
PHR → CI	0.042	0.019	0.026	0.005	0.079	Supported

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 7 reports the indirect effects of Perceived Usefulness and Confirmation on Continuance Intention, mediated by User Satisfaction, and the indirect effect of Perceived Health Risk on Continuance Intention, also mediated by User Satisfaction.

The indirect effect of PU on CI, via US, was significant ( $B = 0.055$ ,  $SE = 0.015$ ,  $p < 0.001$ , 95% CI [0.026, 0.085]), suggesting that User Satisfaction plays a mediating role in this relationship. The same was true for CO, with a significant indirect effect on CI, through US ( $B = 0.161$ ,  $SE = 0.033$ ,  $p < 0.001$ , 95% CI [0.097, 0.225]). However, for PHR, the indirect effect on CI, mediated by US, was not significant ( $B = 0.005$ ,  $SE = 0.005$ ,  $p = 0.305$ , 95% CI [-0.005, 0.015]), indicating no mediating role of User Satisfaction in this relationship.

Table 7. Indirect effects

Effect	Estimate (B)	SE	p-Value	95% Confidence Interval		Result
				Lower	Upper	
PU → US → CI	0.055	0.015	< .001	0.026	0.085	Supported
CO → US → CI	0.161	0.033	< .001	0.097	0.225	Supported
PHR → US → CI	0.005	0.005	0.305	-0.005	0.015	Not Supported

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Table 8 presents the total effects of the three predictor variables (PU, CO, PHR) on the outcome variable, Continuance Intention (CI). The results show significant total effects of PU, CO, and PHR on CI, with estimates of 0.154 (SE = 0.042,  $p < 0.001$ , 95% CI [0.071, 0.237]), 0.738 (SE = 0.035,  $p < 0.001$ , 95% CI [0.670, 0.806]), and 0.047 (SE = 0.019,  $p = 0.015$ , 95% CI [0.009, 0.085]), respectively.

Table 8. Total effects

Effect	Estimate (B)	SE	p-Value	95% Confidence Interval		Result
				Lower	Upper	
PU → CI	0.154	0.042	< .001	0.071	0.237	Supported
CO → CI	0.738	0.035	< .001	0.670	0.806	Supported
PHR → CI	0.047	0.019	0.015	0.009	0.085	Supported

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

In summary, the data provides compelling evidence for both direct and indirect (mediated by User Satisfaction) effects of PU and CO on CI. However, PHR seems to exert a significant direct effect on CI, but no indirect effect mediated by User Satisfaction. The total effects of all three predictors on CI were found to be significant.

## 5. DISCUSSION

This study investigates the drivers influencing Filipino consumers' continuance intention to use mobile wallets. The proposed model is based on ECM extended with perceived health risk, a construct which is deemed important to examine in this 'new normal' since it is seen as a preventive health behavior. The empirical results support the proposed model, given that most predictors significantly affect the continuance intention to use mobile wallets. These findings further provide the following implications.

First, the results of this study confirmed that perceived usefulness positively affects continuance intention via user satisfaction and directly impacts continuance intention. Likewise, confirmation had a strong influence on perceived usefulness. These findings imply that consumers who perceived that the mobile wallet is highly useful would most likely be more satisfied and decide to continuously use the mobile wallet. Also, their assessment of the mobile wallet's usefulness would increase if their experience using it exceeded or confirmed their expectations. These results agree with previous studies' findings, which reported the influence of perceived usefulness on the continued use of innovative products/services such as e-learning (Lee, 2010) and mobile instant messaging (Oghuma et al., 2016). Taking into account these findings, FinTech companies should ensure to provide unique features and services to encourage consumers to use their mobile wallets. They are suggested to inform their current and potential users regularly on the benefits and upgrades (e.g., partnering with new merchants) of their mobile wallet to keep them engaged with the product.

Second, confirmation strongly predicted user satisfaction and indirectly affected continuance intention through user satisfaction. These results match those observed in earlier studies on the mobile wallet (Daragmeh et al., 2021; Jaiswal et al., 2022). A consumer's initial experience using the mobile wallet plays a critical factor in determining their satisfaction levels. This means that a consumer is highly satisfied when they think that the performance of the mobile wallet meets or exceeds their expectations, consequently inciting them to continue using it. Relatedly, findings showed that user satisfaction is a salient predictor of continuance intention, which was confirmed in previous studies (Ayanso et al., 2015; Sreelakshmi & Prathap, 2020; Sanchez & Tanpoco, 2023). Moreover, Bhattacharjee

(2001b) reported that user satisfaction is a major factor in understanding the IS acceptance-discontinuance anomaly. Therefore, consumers should have a delightful experience when using a mobile wallet to boost their satisfaction and opt to select it as a payment method.

Third, the COVID-19 pandemic has drastically changed consumers' payment behavior, compelling them to embrace the use of digital financial solutions such as mobile wallets. Hence, this study included the perceived health risk construct to determine if consumers' mobile wallet usage is affected by their fear of viral contagion. Based on the mediation analysis, findings showed that perceived health threat has a small direct effect on continuance intention. This is consistent with previous studies' results that perceived COVID-19 health risk influences the intention to use e-wallets (Aji et al., 2020; Ojo et al., 2022). However, this study revealed that user satisfaction did not mediate the relationship between perceived health threat and continuance intention. It seems possible that this result is because consumers use the mobile wallet without considering their satisfaction level since it is convenient and conforms with social distancing protocols. Notably, Filipino consumers opted to shift to digital payments to lessen the risk of contracting viruses from handling banknotes and coins (Endo, 2020). In a way, this finding is somewhat like the findings of Ojo, et al. (2022), wherein the presence or absence of facilitating conditions is not an essential factor in the consumers' decision to use e-wallets. On the other hand, this contradicts the result reported by Sreelakshmi & Prathap (2020) that satisfaction fully mediates the relationship between perceived health risk and continuance intention. They implied that continuance intention depends not only on the perceived health threat but on excellent service performance as well, ensuring to keep customers satisfied to further motivate them to continuously use the mobile payment services. Although we are now in the post-pandemic times, consumers are still wary of getting infected by COVID-19 and prefer to avoid long payment queues. Thus, FinTech companies, banks, businesses, and health professionals should promote mobile wallet as a safer payment method since it reduces the need to engage with people and handle items like cash directly. Businesses should partner with mobile wallet service providers and offer consumers the option to pay digitally. This will also ensure businesses' continuity of their operations in case lockdowns will be imposed again.

## 6. CONCLUSION

This research embarked on an in-depth examination of the factors influencing consumers' continuance intention to use mobile wallets in the context of the post-pandemic era. Drawing from the extended ECM and integrating the construct of perceived health risk, the study reflects the new reality where precautionary health behavior plays a significant role in consumer decisions.

The empirical findings robustly support the proposed model, demonstrating that most predictors significantly influence the continuance intention to use mobile wallets. These results not only validate the model but also uncover several valuable implications for both theory and practice.

Firstly, the study reiterates the substantial role of perceived usefulness in shaping continuance intention. Consumers who find mobile wallets useful are more likely to derive satisfaction and decide to continue using the service. In addition, their assessment of the mobile wallet's usefulness tends to increase when their experiences align with or even surpass their initial expectations. This result is consistent with previous studies on technology adoption and usage, emphasizing the pervasiveness of perceived usefulness. In

practice, FinTech companies are urged to continuously innovate and communicate the benefits of their offerings to retain and attract users.

Secondly, this research underscores the profound influence of confirmation on user satisfaction and its consequential indirect impact on continuance intention. Meeting and exceeding user expectations significantly enhance user satisfaction levels, fostering the continuance intention of mobile wallet use. The study thereby reaffirms the centrality of user satisfaction in Information Systems (IS) acceptance and continuance models, highlighting the need to ensure a satisfactory user experience to promote the continued use of mobile wallets.

Thirdly, this study uniquely acknowledges the transformation of consumers' payment behavior due to the COVID-19 pandemic, evidenced by a pivot towards digital financial solutions. The inclusion of perceived health risk construct provides an insightful lens to examine how fear of viral contagion influences mobile wallet usage. Interestingly, while a minor yet significant direct effect of perceived health risk on continuance intention was noted, user satisfaction did not mediate this relationship. This finding posits that health-driven adoption and continued use of mobile wallets may not rely on satisfaction levels as much as on perceived convenience and adherence to social distancing protocols.

As we move forward in the post-pandemic world, health considerations remain paramount in shaping consumer behavior. Thus, service providers, banks, businesses, and health professionals should strategically position mobile wallets as a safer and more convenient payment method. Collaborative initiatives between businesses and mobile wallet service providers can further incentivize digital payment adoption, fostering business continuity and public health in an era of uncertainties.

In conclusion, by integrating the concept of perceived health risks into the ECM framework, this study not only advances the understanding of mobile wallet usage in the post-adoption phase but also contributes to the broader field of ECM research. Although the focus on the Filipino market provides valuable insights, it might limit the generalizability of the findings. Future research should consider applying this model to different populations or include additional variables that may influence continuance intention. As technology evolves and consumer behavior adapts to new realities, it is crucial to continuously refine our theoretical models. This study has made a meaningful stride towards this goal and has opened new avenues for further exploration.

## **7. ETHICS DECLARATION**

The participants of the study were informed of the purpose of the study, duration of participation, study procedures, nature of voluntary participation, data storage and expiration, risks, and benefits before they were asked to give their consent to participate. They are not related to, and they are not under the supervision/tutelage of the researchers. Also, they were informed that they could choose to stop participating in the study at any time. Artificial intelligence was used in the paper strictly for the purpose of improving grammar use and readability. The authors declare no conflict of interest in the conduct of the study.

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