CHAPTER - 3

Impact of Covid-19 on Diffusion of Mobile Wallet Payment Services in Kolkata: An Empirical Study using the UTAUT2 Model

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ABSTRACT

Covid-19 has brought a phenomenal transformation in the way people make payments or transact. The aim of this research paper is to analyse the impact of Covid-19 on the behavioural intention of the users of mobile wallet payment services in Kolkata. This paper also throw light as to which antecedents of behavioural intention are significant among the users. The study is based on 300 valid responses received through Google form-based survey questionnaires. SEM-AMOS were used to assist in our data analysis. The empirical result of the study demonstrated that during the epidemic period all the independent variables have a significant relationship towards behavioural intention of adopting mobile wallet payment services among smartphone users in Kolkata city of West Bengal. Some limitation and suggestions are presented in the study to provide a better idea for future researchers and service provider to enhance the adoption intention of mobile based payment methods.

Keywords: *Behavioural intention; Smartphone; Mobile wallet payment services; Covid-19.*

1.0 Introduction

After affecting almost every sphere of human life, this deadly

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novel coronavirus pandemic has increased the popularity of smartphone and contactless payment methods. The pandemic has brought a major change in the consumer's behavioural pattern to contactless and e-commerce payments.

Again, a surge in the use of mobile wallet payment services had been noticed substantially in the pandemic period because of the concern about the transmission mechanism of the epidemic as one of the reasons for the transmission of this deadly virus is through exchange of metal coins and paper money between peoples. Thus, this virus is acting as a potential source of transmission and it would increase the risk of infection as well. Hence to save people's lives from this epidemic, mobile wallet payment services had played an important role in implementing safety.

Now a days Mobile Wallet Payment System is generally viewed as being a much safer option than handling and maintaining cash as it limits the amount of contact during the process of making payments." When smartphone can function as leather wallet, it is called Digital wallet or widely known as mobile wallet" (Doan, 2014). MW is an electronic pre-paid account, where a registered user can preload a certain amount of money with any service provider which can be expended for almost everything starting from grocery to movie tickets without the need to swipe a plastic card. It is digital equivalent to a physical wallet in which we store cash and make payments from.

The Indian Mobile payment market can be segmented into three categories: Mobile Banking, Mobile point of sale and Mobile Wallet. "The MW segment includes transfer of money, service related to banking transaction, value added services such as shopping, ticketing, recharging and bill payments. The relative advantage which digital wallets offers are convenience, security and affordability over other payment methods specially while transferring money" (Wamuyu, 2014).

According to RBIMaster Circular – "Policy Guidelines on Issuance and Operation of Pre-paid Payment Instruments in India" dated July 01, 2014 four types of wallets are there: -

(i**) Closed wallet:** These are payment instruments generally issued by business establishments for use at their respective establishment only. These instruments do not permit cash withdrawal or redemption e.g., flip kart.

(ii**) Semi-closed wallet:** These are payment instruments which are redeemable at a group of clearly identified merchant location/establishments which contract especially with the issuer to accept the payment instrument. These instruments do not permit cash withdrawal and redemption by the holder e.g., Citrus, oxygen.

(iii**) Semi-open wallet:** These are payment instruments which can be used for purchase of goods and services at any card accepting merchant locations (point of sale terminals). These instruments do not permit cash withdrawal and redemption by the holder e.g., Airtel money.

(iv) **Open wallet**: These are payment instruments which can be used for purchase of goods and services and also permit cash withdrawal e.g., ICICI bank pockets, SBI Buddy, HDFC Bank Payzapp.

Paytm, Mobikwik, Freecharge, Oxigen, and Citrus are few leading MW companies in India.

2.0 Literature Review

Several theoretical models have been developed to examine behavioural intentions for various information technologies among which the important theories are the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975), the technology acceptance model (TAM) (Davis, 1989), the theory of planned behaviour (TPB) (Ajzen, 1991), the diffusion of innovations (DOI) theory (Rogers, 1995) and the unified theory of acceptance and use of technology (UTAUT) (Venkatesh *et al.*, 2003). Some of these models have been extended also for example TAM2 (Venkatesh & Davis, 2000) and UTAUT2 (Venkatesh *et al.*, 2012) are two such prominent extended frameworks. Now a days these extended models have been used to understand the adoption intentions related to adopting the latest

technologies. This study also used UTAUT2 to understand the behavioural intentions and diffusion processes of adopting mobile based payment methods.

- MarvelloYang *et al.*, (2021) explored the factors that motivated the Indonesian youth to use e-wallet in light of their intention to use an e-wallet and adoption of an e-wallet. A total of 501 responses were collected and analysed using partial least square structural equation modelling (PLS-SEM). The result revealed that perceived usefulness, perceived ease of use, social influence, lifestyle compatibility, and perceived trust displayed a significant positive effect on both intentions to use an e-wallet and adoption of an e-wallet.
- Zhao & Bacao (2021) had investigated the technological and mental factors affecting user's adoption Intention of Mobile payment under the Covid-19 pandemic in China. A total of 739 sets of data were obtained from smartphone users. The result showed that users perceptions will be positively influenced when technology's specific characteristic can benefit a particular situation.
- A study done by Husin *et al.*, (2020) to examine the effects of perceived risk, government support and Perceived Usefulness on Customer's Intention to use e-wallets using covid-19 outbreak by comparing Indonesia and Malaysia using Multivariate analysis. 259 sets of data collected from Indonesia and 207 sets of data were collected from Malaysia and tested by using PLS-SEM. The result indicated that the effects of government support on the intention to use e-wallets differ between countries.
- Sudha *et al.*, (2020) had carried out a study to find out the effect of covid-19 on Digital Payments. A total of 220 responses were analysed and tested by statistical tools like t-test, chi-square test and ANOVA test. The finding of the study demonstrated that Digital are dependable and durable, and continue to command a high level of confidence from the general population. However, closure of businesses and the lockdown have resulted in lower transaction volumes overall.

- Daragmeh *et al.*, (2021) had investigate the potential for consumers' continued usage of an E-wallet service through an integrated framework based on two established models: the Health Belief Model (HBM) and Technology Continuous Theory (TCT). 1080 sets of data was collected via electronic survey from academic society in three different Hungarian universities who had used an electronic wallet during the pandemic COVID-19. By using Structural equation modelling (SEM) the result indicated that while the COVID-19 pandemic strongly influenced the current use of e-wallets; the pivotal factor affecting their continued use is based on consumer self-efficacy.

3.0 Research Objectives

- To study the impact of Covid-19 on the Behavioural Intention of Mobile Wallet Users in Kolkata.
- To assess which antecedents of Behavioural Intention are significant among users of Mobile Wallet Payment Services in Kolkata.
- To study the demographics characteristics of the respondents.

3.1 Proposed research model

Based on the aforementioned theories, numerous researchers have carried out experiments to quantify behavioural intention and pinpoint the variables that affect it.

3.2 Hypothesis framed

Performance Expectancy is defined as "the degree to which using a technology will provide benefits to consumers in performing certain activities" (Venkatesh *et al.*, 2012).

H_1: Performance Expectancy significantly affects buyer's behavioural intention to use mobile wallet.

Effort expectancy is defined as "the degree of ease associated with consumers' use of technology" (Venkatesh *et al.*, 2012).

H_2: Effort Expectancy significantly affects buyer's behavioural intention to use mobile wallet.

Social Influence is defined as "the extent to which consumers of technology perceive that people who are important to them (e.g. relatives, friends) think they should use the technology" (Venkatesh *et al.*, 2012).

H_3: Social Influence significantly affects buyer's behavioural intention to use mobile wallet.

Facilitating Conditions is defined as "consumers' perceptions of the resources and supportavailable to perform a behaviour" (Venkatesh *et al.*, 2012).

H_4: Facilitating Conditions significantly affects buyer's behavioural intention to use mobile.

Hedonic Motivation is defined as "the fun or pleasure derived from using a technology" (Venkatesh *et al.*, 2012). wallet.

H_5: Hedonic Motivation significantly affects buyer's behavioural intention to use mobile wallet.

"It is a person's perception of the cost he/she spends to use a system towards its perceived benefits. As the technology is not provided for free by the organization unlike in the organizational use context, the cost of using the technology and pricing structure have significant impact on consumers' technology use" (Venkatesh *et al.*, 2012).

H_6: Price Value significantly affects buyer's behavioural intention to use mobile wallet.

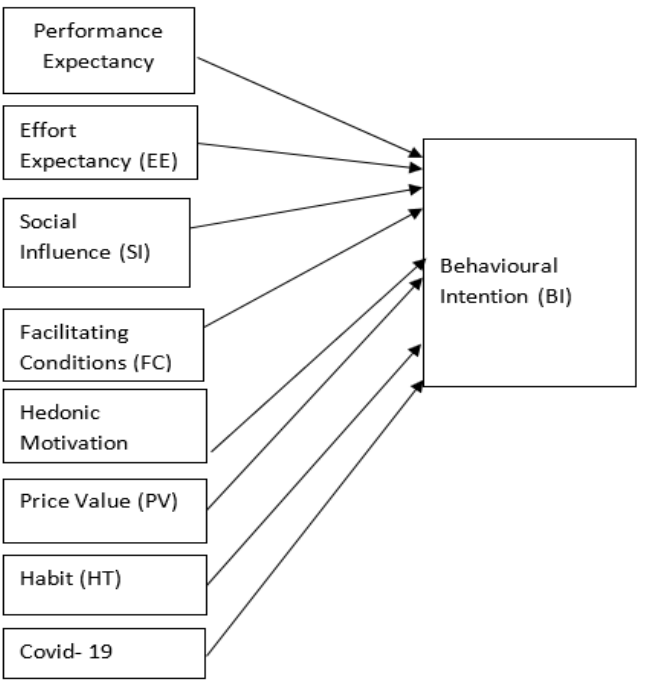
"It has been defined as the extent that individuals tend to execute behaviours automatically because of learning" (Venkatesh *et al.*, 2012).

H_7: Habit significantly affects buyer's behavioural intention to use mobile wallet.

An unprecedented emergency situation occurred in 2019 named Coronavirus or Covid-19 (Figure 1). The effects of this pandemic have brought a paradigm shift in consumers behaviour.

H_8: Covid-19 significantly affects buyer's behavioural intention to use mobile wallet.

Figure 1: Proposed Research Model



Source: Authors' proposed research model

4.0 Research Methodology

4.1 Data collection and sample design

The study was conducted on smartphone users in Kolkata who have entered into a mobile wallet transaction at least one times after the unprecedented situation i.e., covid-19. An online survey questionnaire was created using Google form as a medium and administered online during the month of April 2021 to 300 respondents.

The sampling technique used was convenience sampling due to the ease of access to email ids and higher response rate. All

constructs and items of survey questionnaire are adapted from literature (refer Appendix 1) except Covid-19 which is developed for the first time. Measurement item for Performance Expectancy, Effort Expectancy, Social Influence, facilitating conditions, Price Value, Hedonic Motivation and Habit are adapted from Venkatesh *et al.*, 2012 and items of Covid-19 are self-developed. Each item was measured on a seven-point Likert scale, ranging from 1 (totally disagree) to 7 (totally agree).

4.2 Measurement and scales

The questionnaire was structured into two parts; the first section dealing with demographic profile (see Appendix 2) of the respondents. The information on the identified items was collected in the second part. To refine the survey instrument, a pre-test was executed with 30 users of mobile wallet payment services who was having an interest in this domain along with others. Based on their feedback, few changes were made to enhance the appropriateness and comprehensiveness of the questionnaires. The final questionnaires included 34 items to measure eight independents (Performance expectancy, Effort expectancy, Social influence, Facilitating conditions, Hedonic motivation, Price value, Habit, Covid-19) and one dependent (Behavioural intention) variables.

5.0 Data Analysis

5.1 Descriptive statistics

The composition of respondents is presented in Appendix-2 wherein the majority of respondents were young belonging to age group of below 35 years and in that too majority belonging to 20–29 years of age. The majority of respondents belonged to tech-savvy urban youth in India. As with regard to gender, sample represented 177 male and 123 female respondents. Given the convenience sampling method adopted, a majority of respondents were students belonging to the income bracket of below Rs 250,000 annually. On the basis of education qualification, a majority of respondents had

been pursuing or had completed post-graduation and higher education, leading to a more mature respondent sample. Questionnaire has been appended in Appendix.

5.2 Measurement model

The Measurement Model was assessed for construct reliability, Convergent validity and Discriminant validity. Construct reliability was tested using the composite reliability (refer Table 1).

The analysis was done in two phases in which the first phase comprised of the assessment of measurement model model fit, internal reliability and validity diagnosis. The reliability of internal consistency of the constructs was verified by computing composite reliability as proposed by Chin (1998) and its value should be greater than 0.7. Average variance extracted (AVE) was used to analyse convergent validity in order to examine the unidimensionality of the constructs in which AVE should be greater than 0.5 (Fornell & Larcker, 1981).

Table 1: Validity and Reliability

Construct	Composite Reliability	Average Variance Explained
Performance Expectancy	0.800	0.503
Effort Expectancy	0.855	0.625
Social Influence	0.807	0.577
Facilitating conditions	0.859	0.637
Hedonic Motivation	0.821	0.609
Price Value	0.830	0.602
Habit	0.781	0.541
Covid-19	0.801	0.500

Source: Authors' calculation

Discriminant Validity of the construct was evaluated using two criteria: Fornell-Larcker criteria and cross-loadings criteria. Fornell-Larcker indicates that the square root of AVE should be greater than all correlations between each pair of constructs (Chin, 1998). And all diagonal values (square root of AVE) are greater than off-diagonal values (correlations between the construct). The cross-loadings criteria suggest that the loading of each indicator should be higher than all cross-loadings (Fornell & Larcker, 1981). All the loadings are greater than the corresponding cross-loadings. Thus, both criteria are satisfied providing evidence of discriminant validity of the scales.

The second phase of assessment comprised of assessing the structural model by computing R^2 of the model in which relationships between the antecedents and dependent variables were analysed to assess the variability explained by antecedents. The R^2 value ranges from 0 to 1 and the value closer to 1 indicates greater proportion of variability explained by the selected antecedents.

Here, the Measurement Model (refer Table 2) results are satisfactory. Hence, the construct can be used to test the structural model.

5.3 Structural model

After confirming reliability & validity of the measurement model and assessing the model fit measures (refer Table 2), a Structural Model was constructed in AMOS (see Figure 2.) and following output was generated:

Among the key factor that has the most significant influence on consumer behavioural intention to adopt mobile wallet payment services in Kolkata, this study proposed hypothesis based on UTAUT2 model. In order, Hedonic Motivation was the strongest factor that was significantly affected with probability level of less than 0.001 (.***), followed by shows effort expectancy with probability level of less than 0.01, Performance Expectancy and Facilitating Conditions with probability level of less than 0.05.

Figure 2: Result Summary of Research Model

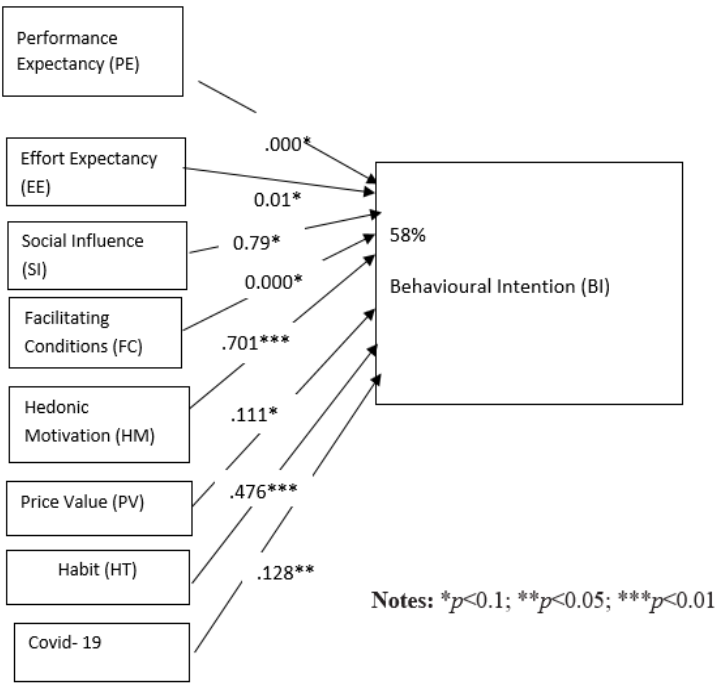


Table 2: Model-fit Indices of the Measurement Model and Structural Model

	χ2 DF	CFI	GFI	NFI	TLI	RMSEA
Recommended Value	<3	>0.9	>0.9	>0.9	>0.9	<0.08
Measurement Model	1.648	0.949	0.833	0.880	0.940	0.057
Structural Model	1.914	0.927	0.807	0.861	0.915	0.068

Source: Authors' calculation

Here, it is observed that all factors proposed in this study significantly influence the behavioural intention of smartphone users

to adopt mobile wallet payment services, thereby supporting all hypotheses formulated.

6.0 Discussion and Conclusion

The aim of this study is to examine the impact of Covid-19 on the user's acceptance of mobile wallet payment services in Kolkata. The study successfully extended the existing technology adoption framework to include a new variable i.e., Covid-19.

The result of this research indicates a significant relationship between independent factors Performance Expectancy, Effort Expectancy, Social Influence, facilitating conditions, Price Value, Hedonic Motivation, Habit and Covid-19 with the dependent variable Behavioural Intention to adopt mobile wallet payment services. Furthermore, we can see that all hypothesis are supported.

Performance Expectancy is the expectations of consumers that using the new mobile technology will improve their performance or productivity. In other words, consumers perceive that regular usage of any latest technology provides benefits to them in performing payment tasks effectively and efficiently. Thus, consistent with the result of previous studies conducted in the field of mobile technology adoption (Shin, 2009; Kim *et al.*, 2010; Thakur & Shrivastava, 2014; Yan & Yang, 2015).) the present study also observed that Performance Expectancy has a positive and significant influence on Behavioural Intention in respect of the adoption of mobile wallet payment services.

Effort Expectancy is the effort expected by the consumer's to be required in using any new technologies. The more the effort will be needed, the less will be the usage of that new technologies and vice-versa. Here the result of this study indicating a significant relationship between Effort Expectancy and Behavioural Intention to adopt mobile wallet payment services is in line with the earlier studies (Amin 2009; Lai *et al.*, 2014).

In this study social influence was observed to be significant in influencing consumers acceptance of mobile wallet payment

services. The result is consistent with the work of previous researchers who observed social influence as significant factor in predicting Behavioural Intention for new mobile technologies (Venkatesh & Davis, 2000; Schierz *et al.*, 2010; Venkatesh *et al.*, 2012; Slade *et al.*, 2015). Here also it is found that recommendation and positive word of mouth of family, friends, peer groups etc who are influential and important may bring change in the Behavioural Intention of consumers trying out any latest technologies.

Facilitating conditions is the conditions that proved to be a facilitator for consumers in using a latest technology i.e., availability of the necessary resources and infrastructure required for performing a mobile wallet transaction such as an internet enabled smartphone, an uninterrupted internet connection, necessary knowledge, and so on also have a positive and significant influence on Behavioural Intention in adopting mobile wallet technology. This result is consistent with the result so fear lier studies conducted in the area of new technology adoption (Yang, 2010; Amoroso & Magnier-Watanabe, 2012; Chong, 2013; Hew *et al.*, 2015).

Price Value is the value receivable in exchange of the price paid, to avail any latest technologies in the field of mobile technology adoption. The more the consumer perceives the received value is worth in respect of its price paid, the more is the Behavioural Intention of the consumers to adopt the new technology. This observation supports the result of previous studies conducted in the area of adopting the latest technology (Pagani, 2004; Amoroso & Magnier-Watanabe, 2012).

Hedonic Motivation is defined as "the fun or pleasure derived from using a technology" (Venkatesh *et al.*, 2012). The more the consumer's find the features and functions of mobile wallet applications entertaining and drives fun while using the same, the more they will have the intention to use the applications. This result is in alignment with Hew *et al.*, (2015), Venkatesh *et al.*, (2012), Yang, (2015).

Habit is defined as how far technology users tend to use the technology automatically based on previous learning process.

Therefore, the more a particular technology is being used frequently by the users with a positive mindset, the more the users will become reliant on it and ultimately habit emerges as a consequence of benefits that it offers. Hence, Habit plays a factor of importance, when it comes to determine the Behavioural Intention of consumers to use mobile wallet payment services. This finding is in line with the findings of previous researchers done in the context of adopting any new technology (Liao *et al.*, 2006; Limayem *et al.*, 2007).

Lastly, this research analysis observed that another significant factor to the Behavioural Intention to adopt mobile wallet payment services is the new self-developed construct i.e., Covid-19. The influence of Covid-19in predicting Behavioural Intention of consumers to adopt mobile wallet payment services is notable in the study. Therefore, Consumer's inclination towards emergency situation arising in the country will have a strong impact on the consumer's adoption behaviour.

7.0 Limitation and Recommendation for Future Research

This study is focusing only on Mobile Wallet services, not on other modes of payments available in the context of mobile payments. Therefore, future researchers can conduct the study by adopting other modes of mobile payments. This study will suffer from selection bias, as it is relying only on primary information collected from the respondents and it is focusing only on urban/ population around Kolkata city.

Only one self-developed factors have been developed in this study with all the construct of UTAUT2 Model to measure the impact of Covid-19 on the user's acceptance of mobile wallet payment services. However, there might be other factors relating to new technology adoption, which should be included in future research to conduct a more comprehensive study.

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Appendices

Appendix 1: Questionnaires and Source

Factors/ Construct	Items	Sources
Performance Expectancy (PE)	PE1 - Mobile Wallet is useful to carry out my tasks.	Venkatesh *et al.*, (2012)
	PE2 - I think that using mobile Wallet would enable me to conduct tasks more quickly	
	PE3 - I think that using mobile Wallet would increase my productivity	
	PE4 - I think that using mobile Wallet would improve my performance	

Effort Expectancy (EE)	EE1 - My interaction with mobile payment would be clear and understandable.	Venkatesh *et al.*, (2012)
	EE2 - It would be easy for me to become skilful at using mobile payment	
	EE3-I would find mobile payment easy to use.	
	EE4 - I think that learning to operate mobile payment would be easy for me.	
Social Influence (SI)	SI1 People who are important to me think that I should use mobile wallet.	Venkatesh *et al.*, (2012)
	SI2 People who influence my behaviour think that I should use mobile wallet.	
	SI3 People whose opinions that I value prefer that use mobile wallet.	
Facilitating Conditions (FC)	FC1 I have the resources necessary to use mobile wallet.	Venkatesh *et al.*, (2012)
	FC2 I have the knowledge necessary to use mobile wallet.	
	FC3 Mobile wallet is compatible with other technologies I use.	
	FC4 I can get help from others when I have difficulties using mobile wallet	
Hedonic Motivation (HM)	HM1 Using mobile wallet is fun.	Venkatesh *et al.*, (2012)
	HM2 Using mobile wallet is enjoyable.	
	HM3 Using mobile wallet is very entertaining.	
Price Value (PV)	PV1 Mobile wallet is reasonably priced.	Venkatesh *et al.*, (2012)
	PV2 Mobile wallet is a good value for the money.	
	PV3 At the current price, mobile wallet provides a good value.	
Habit (HT)	HT1 The use of mobile wallet has become a habit for me.	Venkatesh *et al.*, (2012)
	HT2 I am addicted to using mobile wallet.	
	HT3 I must use mobile wallet.	
Behavioural Intention (BI)	BI1 I intend to continue using mobile wallet in the future.	Venkatesh *et al.*, (2012)
	BI2 I will always try to use mobile wallet in my daily life.	

	BI3 I plan to continue to use mobile wallet frequently.	
Covid-19 (CO)	CO1: I was aware of Mobile Wallet Payment System before covid-19, but was not using it.	Author's Construct
	CO2: During covid-19, I have started using Mobile Wallet Payment System.	
	CO3: Lockdown due to covid-19 has forced me to use Mobile Wallet Payment System.	
	CO4: Covid-19 has made me tech-savvy.	

Appendix 2: Demographic Characteristics

Profile	Categories	Frequency	Percentage (%)
Gender	Male	177	59
	Female	123	41
Age	Below 20	67	22.33
	20-29	119	39.67
	30-39	74	24.67
	40-49	31	10.33
	50 or above	9	3
Highest Level of Education	12th Grade	54	18
	Bachelor's degreeMaster	122	40.67
	DegreeDoctorate	61	20.33
	degree	63	21
Duration of using Smartphone	2 years or less	96	32
	3 to 5 years	148	49.33
	More than 5 years	56	18.67
Occupation	Student	112	37.33
	Employed for Wages	23	7.67
	Self-employed Professionals	103	34.33
	Currently Unemployed	29	9.67
	Others	33	11
Monthly Income	Below 250000	109	36.33
	250000-50000500000-1000000Above 1000000	98	32.67
		42	14
		51	17
Are you using Mobile Wallet?	Yes	300	100
	No	-	-

Appendix 3: Summary of Hypothesis Results

No	Hypothesis	Result
H1	Performance Expectancy significantly affects buyer's behavioural intention to use mobile wallet.	Accepted
H2	Effort Expectancy significantly affects buyer's behavioural intention to use mobile wallet.	Accepted
H3	Social Influence significantly affects buyer's behavioural intention to use mobile wallet.	Accepted
H4	Facilitating Conditions significantly affects buyer's behavioural intention to use mobile wallet	Accepted
H5	Hedonic Motivation significantly affects buyer's behavioural intention to use mobile wallet.	Accepted
H6	Price Value significantly affects buyer's behavioural intention to use mobile wallet.	Accepted
H7	Habit significantly affects buyer's behavioural intention to use mobile wallet	Accepted
H8	Covid-19 significantly affects buyer's behavioural intention to use mobile wallet.	Accepted