

# Factors Influencing Mobile Payment Adoption in Hong Kong: A Quantitative Study

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**ABSTRACT**— *Mobile payment system is gaining increasing acceptance as a mode of payment in the current economic environment. With the growing popularity of mobile payments, it is important to identify the key factors that motivate people use mobile payment. Pinpointing such factors would allow businesses to build the right mobile payment for customer’s needs. This article relies on a novel integrated model and a qualitative method to answer the question "what are the key factors influencing Mobile Payment Adoption in Hong Kong, a global metropolis where mobile payment is making steady inroads". This study use a quantitative approach with a sample size of 203 to investigate the Influence of eight factors on Behavioural Intention to use mobile payment. The results show that factors relating to “Hedonic Motivation”, “Habit”, “Perceived Usefulness”, “Perceived Ease of Use”, “Social Influence” and “Government Support” significantly affect the Behavioural Intention to use mobile payments to conduct online transactions, while “Perceived Risk” and “Perceived Cost” shows no significant effect. Although the TAM/UTAUT model has been extensively studied in the previous research on mobile payment services, little effort has been done to combine and investigate other influencing factors in order to test their effects on the intention to adopt mobile payment. As a result of this, this study contributed by developing and testing a novel integrated model providing a valuable guideline to help researchers looking into issues related to mobile payment services in Hong Kong.*

**Keywords**—Mobile payment, Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Structural Equation Modeling (SEM).

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## 1. INTRODUCTION

Today, a variety of e-payment systems exist to allow secure transactions for business or personal use. They all have various underlying concepts and applications. All these solutions have different limitations in terms of how they work and what they may be used for (Patel, Y. & Goswami, M., 2010).

Abrazhevich, D. (2004) describes an e-payment system as a form of financial commitment between a buyer and a seller via the use of electronic communications. Briggs, A. & Brooks, L. (2011) define e-payment as a form of inter-connections between companies and individuals, facilitated by banks and inter-switch houses, that allows for electronic monetary exchange.

The history of electronic payments may be traced back to 1918, when the United States Federal Reserve Bank (FED) used telegraph to transport currency for the first time. However, until the Automated Clearing House was established in 1972 that technology was not widely used in the United States. Since then, electronic currency has grown in popularity (CSG, F., 2021). The first generation of pre-funded electronic payment schemes was introduced in the 1980s with monetary values protected and managed on the chip of a smart card for single-purpose prepaid services (Hartmann, M., 2006).

### 1.1 E-payment Methods in Hong Kong

A large number of e-payments services have been developed within the payment system around the globe. The number of e-payment methods available today can be overwhelming for most people, making it difficult to choose the best option. Here are the some examples of e-payment methods in Hong Kong:

**Debit Cards and Electronic Payment Services (EPS):** In Hong Kong, a debit card is given when a bank account is opened. Debit cards deduct funds directly from a bank account, allowing holders to spend only the funds available in their account. Businesses using EPS need to install special software and hardware, and customers then enter their debit card information into a virtual terminal to complete transactions. It helps to minimize security and staffing costs by reducing the amount of cash to be kept on the premises.

**Credit Cards:** In the last few years, credit cards have grown in popularity all over the world. Since there are so many credit card providers in Hong Kong, consumers frequently end up having a large number of physical cards all of which impose hefty interest rates if people do not pay their bills on time.

**Octopus Card:** Octopus is a contactless stored value card that is undoubtedly one of Hong Kong's most popular payment options. The Octopus card was first introduced in 1997 and has subsequently grown in popularity across public transportation systems. The fact that there is no monthly statement makes it harder to track expenditures. Another disadvantage is that people must top up the card on a frequent basis.

**Faster Payment System (FPS):** It was first introduced in 2018 by the Hong Kong Monetary Association. It offers real-time multi-currency payments in Renminbi (Chinese yuan) and Hong Kong dollars. However, in order to complete the transaction, users must first register with the company.

**Mobile Payment:** Using micro-payment methods, mobile devices can be used for payment that is supported by an authentication system to ensure the safety and comfort of each transaction (León, C., 2021). There are several advantages in adopting the mobile payment, including the fact that it is an independent payment that is easily accessible everywhere and that it eliminates the chance of long lines due to cash payments. Aside from the benefits, there are various factors that can prevent people from using it, such as high payment system charges, perceived security risks, incompatibility with large payments, and mobile payment immunity (Karsen, M., Chandra, Y.U. & Juwitasary, H., 2019). Mobile payments, on the other hand, can help to promote and encourage payment services, such as person-to-person transfers, government-to-person transfers, online and offline sales of goods and services (person-to-business transfers), and bill and fee payment. (Bezhovski, Z., 2016 & Mumtaza, Q. et al., 2020). There are a few popular mobile payment in Hong Kong such as Payme, AliPay, WeChatPay, ApplePay, and so forth.

## **1.2 The Research Problem**

With the advancement of high-speed communication technology and the widespread adoption of mobile intelligent terminals, mobile Internet has emerged as the world's fastest-growing industry with the highest market potential (Chen, Z. & He, X., 2020).

And with the COVID-19 arriving, more individuals in Hong Kong are turning to non-contact payment methods, one of which is mobile payment, a tool that has grown in popularity as a result of the COVID pandemic (Ly, D., 2021). While this form of payment technology is not entirely new, the COVID outbreak has provided it with a new lease of life. (Daragmeh, A., Lentner, C. & Sági, J., 2021) and boosted its use as a convenient means of payment. (Perez, S., 2021).

Despite the numerous advantages of using a mobile payment system, many consumers have yet to accept or use it. It could be for a variety of reasons, including lack of security or knowledge on how to utilize it. Those that use mobile payment, on the other hand, may have previous familiarity with it. As a result, the goal of this article is to determine what factors influence consumers' decisions to use mobile payments. This is one of the first studies focusing systematically on that question in Hong Kong.

## **1.3 The Objective of this Article**

The purpose of this article is to investigate factors that influence the use and adoption of mobile payments in Hong Kong. The success of any technology can be measured by how well it integrates into social life and draws its worth from its application to human activities. As a result, the adoption of any new "technology" is worth exploring. With the rapid growth of the electronic payment system, it has become one of the most essential technologies to emerge from e-commerce.

Hence, there is a need to examine the propensity of users to engage in e-commerce transactions and make the payment electronically. More specifically, investigating the key factors that may influence e-commerce user's propensity to use e-payment system should help business planners and policymakers to stimulate demand for this versatile means of payment. This is the focus, in the specific Hong Kong context, of the present article. The next section will offer a survey of the relevant academic literature, geared towards providing an appropriate theoretical framework to serve as the

foundation for the development of an integrated model and the formulation of pertinent hypotheses.

## 2. LITERATURE REVIEW AND THEORETICAL SYNTHESIS

### 2.1 Development of a Novel Integrated Model

Behavioral Intention (BI) is a metric that assesses the likelihood of a person purchasing or using a specific product, service, or technology (Davis, F., 1989). Various studies have been conducted in order to identify the most important factors influencing new technology usage behavior. I examine below the Theory of Reasoned Action (TRA), The Planned Behavior Theory (TPB), The Technology Acceptance Paradigm (TAM), and The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) as a way of creating an integrated model (Figure 1 & 2).

In 1967, the Theory of Reasoned Action (TRA) was developed to investigate the relationship between attitudes, subjective norms, and behavioral intentions. (Ajzen, I. & Fishbein, M., 1969). The behavioural intention is influenced by a person's attitude, regardless of whether the expected consequence is useful or not. Subjective norms are influenced by normative views and incentives to emulate, whereas attitudes are influenced by beliefs and judgements (Ajzen, I. & Fishbein, M., 1969).

The Planned Behavior theory (TPB) is an extension of TRA formulated by adding the Perceived Behavior Control which is an individual's perception of how easy or difficult it is to engage in a specific behavior (Ajzen, I., 1985).

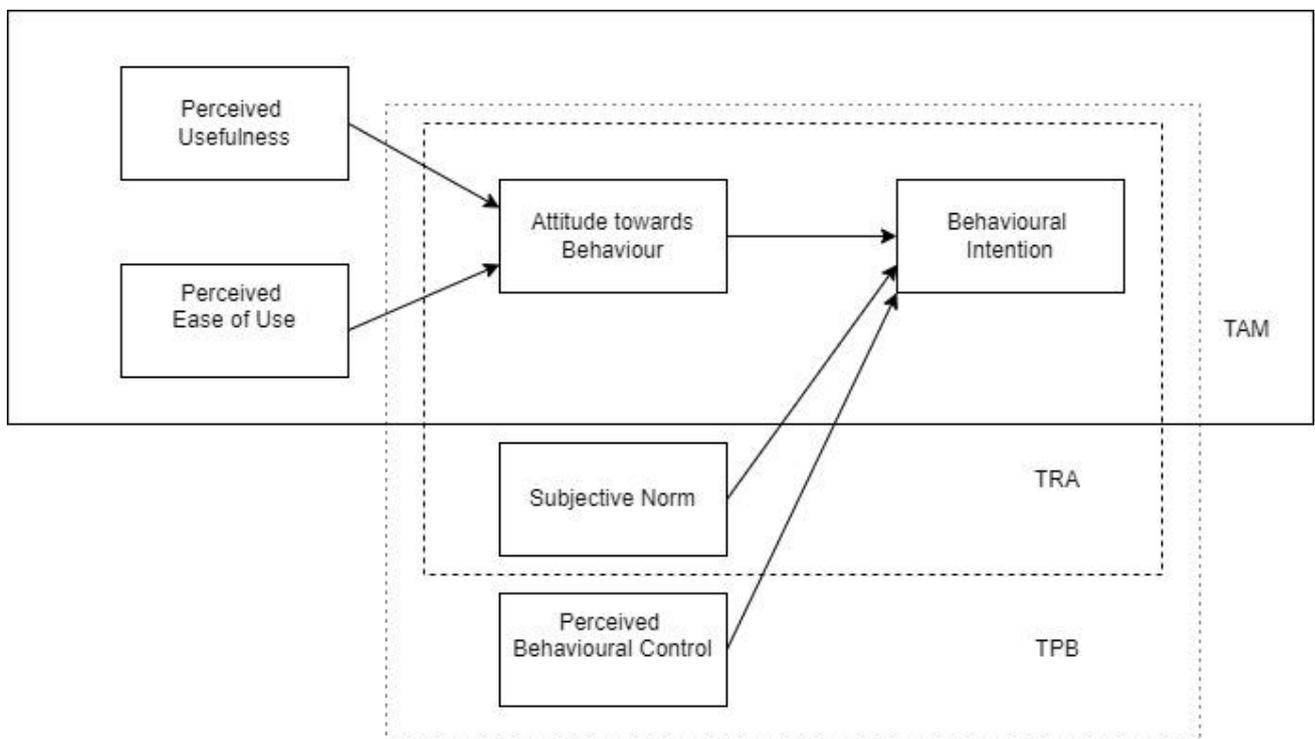


Figure 1. The Theoretical Model of TRA, TPB and TAM

In 1989, Davis, F. (1989) introduced the Technology Acceptance Model (TAM) that explains the relationship between user attitudes and the perceived interest in technology adoption, as well as actual adoption. TAM is one of the many models used and cited in research on information systems or technology adoption (Nur, T. & Panggabean, R., 2021). TAM builds on TRA to explain and predict user interest in diverse information systems. TAM's primary variables are Perceived Usefulness (PU) and Perceived Ease of Use (PE). People tend to use information systems technology if they think that it is easy to use and may improve their job performance (Davis, F., 1989). The relationship between TRA, TPB and TAM could be found in Figure 1.

Subsequently, Venkatesh et al. (2003) formulated a theoretical framework referred to as the UTAUT model (Unified Theory of Acceptance and Use of Technology). The UTAUT model aims to explain user intentions to adopt new technology and subsequent usage behavior in terms of four constructs: Performance Expectancy, Effort Expectancy,

Facilitating Condition and Social Influences. Nearly a decade later, in 2012, Venkatesh, V., Thong, J. & Xu, X. (2012) modified the UTAUT model by adding Hedonic Motivation, Price Value and Habit to create the UTAUT2 model (see Figure 2).

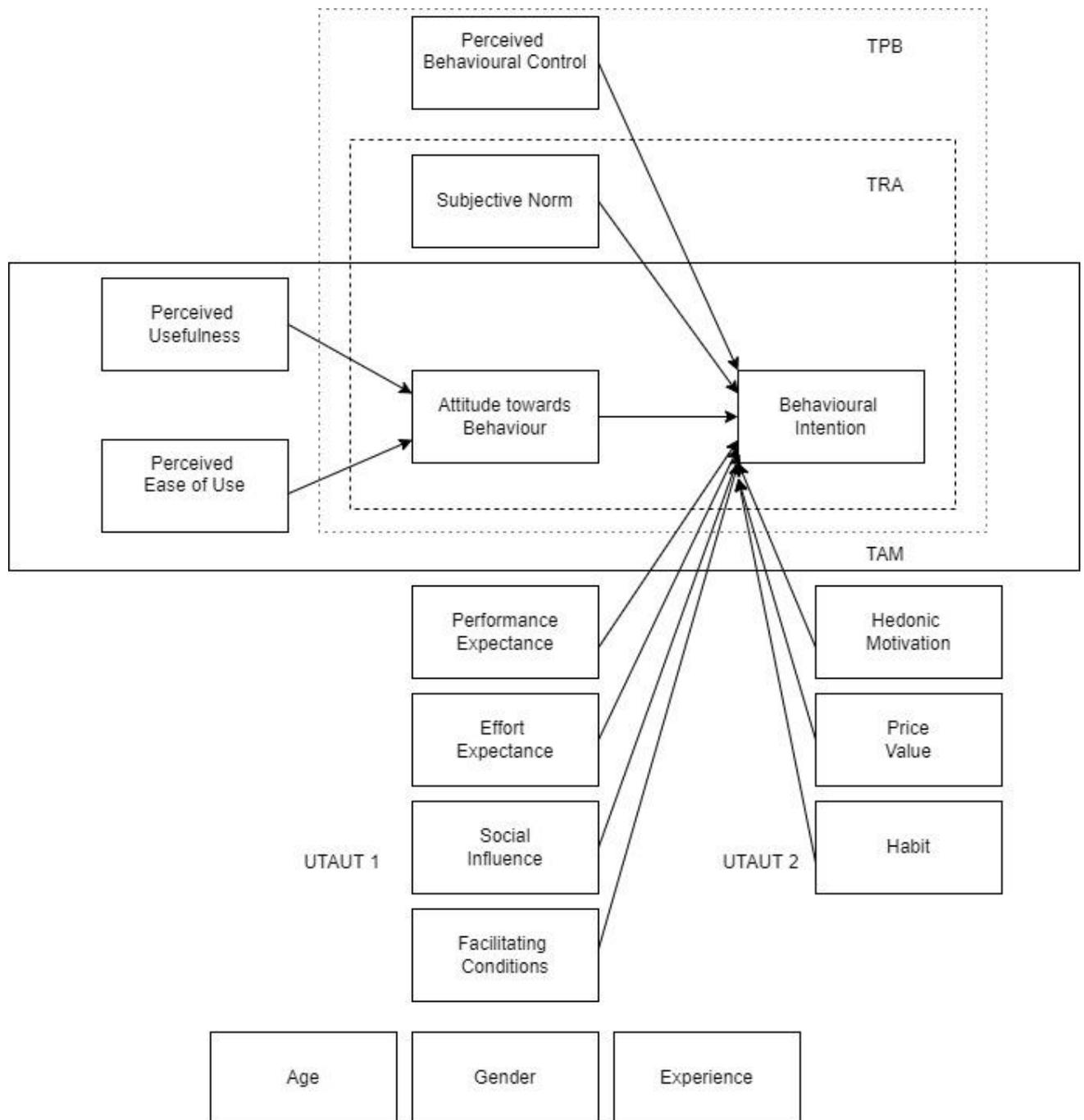


Figure 2. The **Integrated** Model of TRA, TPB, TAM, UTAUT1 and UTAUT 2

## 2.2 Development of Hypotheses

### The Influence of Hedonic Motivation (HM) on Behavioral Intention

HM is defined as “the fun or pleasure derived from using technology” (Venkatesh et al., 2012). Mobile payment has the potential to be entertaining for users as a new type of payment. (Oliveira et al., 2016). If it is, in fact, enjoyable, they

are more likely to adopt it. It has been shown that enjoyment and fun have a big impact on a customer's attitude toward new technology (Dabholkar, P., Bobbitt, L. & Lee, E., 2017).

Sharif, A. & Raza, S. (2017) has shown the Hedonic Motivation is considered to be the most important factor in affecting customer's willingness to accept new online payment, while Widyanto, H., Kusumawardani, K. & Septyawanda, A. (2020) have found that Hedonic Motivation directly and significantly affects Behavioral Intention to use mobile payment. Furthermore, Hwang, Y. & Kim, D. (2007) have argued that Hedonic Motivation has an impact on the two components of e-trust which are integrity and ability. This suggests that customers who enjoy having fun and entertainment on internet banking in the same way and gain confidence in using online channels. A similar result has also been obtained by Khatimah, H., Susanto, P. & Abdullah, N. (2019) who has reported that Hedonic Motivation plays an important role in enhancing customer trust in e-payment. Based on these propositions, the following hypothesis is proposed: H1: Hedonic Motivation has a significant positive effect on Behavioral Intention

#### The Influence of Habit (HB) on Behavioral Intention

According to Venkatesh et al. (2012), a habit is an action that people perform frequently because they have knowledge about it. HB is a behavioural pattern that people engage in as a result of previous learning (Chen, W. et al., 2020). De Guinea, A. & Markus, M. (2009) have explored the role of habit as a key factor affecting the decision to continue using technology. HB is a significant predictor of future adoption and use of technology (Kim, S. & Malhotra, N., 2005). Based on Yu, G., Qi, Q. & Cho, N. (2019), habit has positive effects on users who use AliPay and WechatPay. Jia, A., Song, X. & Hall, D. (2020) have shown that consumers' online purchasing, mobile service use, and cell phone use habits all demonstrate a positive relationship with their mobile payment use habit, which influences their intention to continue using mobile payments.

This article has relies on the above studies' findings establishing a positive association between Habit, Behavioural Intention, and adoption. Based on these findings, the following hypothesis is proposed: H2: Habit has a significant positive effect on Behavioral Intention

#### The Influence of Perceived Usefulness (PU) on Behavioral Intention

PU is one of the independent constructs in the Technology Acceptance Model (TAM). It is "the degree to which a person believes that using a particular system would enhance his/her job performance" (Davis, F., 1989). PU gauges the customers' willingness to adapt something new compared to traditional values (Tan, M. & Teo, T., 2000). Tan, G. et al. (2014) have conducted a study in which the findings show that the intention to use mobile payment is determined by Perceived Usefulness, Perceived Ease of Use, Social Influence, and Personal Innovativeness in information technology. Gong, M., Xu, Y. & Yu, Y. (2004) have established that PU has both a direct and indirect effect on intention to use, and the direct effect is significant. Several researchers also used Perceived Usefulness and Perceived Ease of Use as predictors for explaining intention for technology use (Shin, D., 2010; Wu, J. & Wang, S., 2005).

Mun, Y., Khalid, H. & Nadarajah, D. (2017) have shown that PU is the strongest determinant of consumers' intention to use mobile payment services. Kim, C., Mirusmonov, M. & Lee, I. (2010) have demonstrated that Perceived Usefulness and Perceived Ease of Use are strong predictors of the intention to use mobile payment. Other studies have produced the same result (To, A. & Trinh, T., 2021; Sanaji, Indarwati, T. & Candra, I., 2021). Based on these findings, the following hypothesis is proposed: H3: Perceived Usefulness has a significant positive effect on Behavioral Intention

#### The Influence of Perceived Ease of Use (PE) on Behavioral Intention

PE is one of the two vital elements in the Technology Acceptance Model (TAM) that influence individual intention to use technology (Davis, F., 1989). PE is defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, F., 1989). Venkatesh et al. (2012) defines PE as "the degree to which using technology will provide benefits to consumers in performing certain activities".

PE has been found could influence the consumers' perception of mobile payment usage (Roseli, N. et al., 2021). The positive effect of PE on Behavioural Intention has been validated in research in the context of mobile payment (Slade, E. et al., 2014). Other studies have found that PE has a significant effect on usage intention, either directly or indirectly, through its impact on perceived usefulness (Mun, Y., Khalid, H. & Nadarajah, D., 2017; Malik, A. & Annuar, S., 2021) Based on the explanation above, the following hypothesis is proposed: H4: Perceived Ease of Use has a significant positive effect on Behavioral Intention

### The Influence of Social Influences (SI) on Behavioral Intention

SI are “the extent to which consumers perceive that important others (e.g., family and friends) believe they should use a particular technology” (Venkatesh et al., 2012). According to Nassar, A., Othman, K. & Nizah, M. (2019), SI are encouraging people to use mobile payment systems if they believe the technology's importance will benefit their decision to adopt and use mobile payment. SI' impact on Behavioral Intention has been supported in various studies (Slade et al., 2014; Tan et al., 2014) which have shown that SI significantly impact Behavioral Intention to use new technologies in learning management systems (Alshehri, A., Rutter, M. & Smith, S., 2019) and mobile payment (Oliveira, T. et al., 2016).

Abrahão, R., Moriguchi, S. & Andrade, D. (2016) have demonstrated that 76% of behavioral intention is explained by performance expectation, effort expectation, social influences and perceived risk using structural equation modeling. Musa, A., Khan, H. & Alshare, K. (2015) have established that SI, and perceived information security have direct significant effects on consumer's behavioural intention to adapt mobile payment. Similarly, Nur, T. & Panggabean, R. (2021) have similarly determined that factors relating to Performance Expectancy, Social Influences, Facilitating Condition, Perceived Enjoyment, and Trust significantly affect the Behavioral Intention to use mobile payments. Based on these findings, the following hypothesis is proposed: H5: Social Influences have a significant positive effect on Behavioral Intention

### The Influence of Government Support (GS) on Behavioral Intention

Tan, M. & Teo, T. (2000) have defined GS as “government assistance” and asserted that GS can play an intervening and leading role in the diffusion of technological innovation. Government trust, in general, refers to “perceptions regarding the integrity and ability of the agency providing the service” (Mayer, R., Davis, J. & Schoorman, F., 1995; Mcknight, D., Cummings, L. & Chervany, N., 1998). Results obtained by Belanger, F. & Carter, L. (2009) have suggested that trust of the government positively affects the intentions to use an e-government service. Previous studies also have confirmed that GS can play an intervening role and has a significant impact on the adoption of innovative information technologies (Nugroho, M., 2015; Muthukkannu, G., 2020).

Sleiman, K. et al. (2021) have shown that government monitoring is the most significant factor for customer trust, followed by reputation, and security and that government monitoring directly influences the Behavioral Intention and adoption of mobile payment systems. Government monitoring leads to the success of e-commerce due to people's trust in the government. Specifically, such trust creates early trust toward using a mobile payment system (Nishimura, Y., 2020). Chua, C. et al. (2020) have similarly established that GS can exert significant direct positive influence on mobile phone payment usage. Based on these findings, the following hypothesis is proposed: H6: Government Support has a significant positive effect on Behavioral Intention

### The Influence of Perceived Risk (PR) on Behavioral Intention

Bauer, R. (1960) defines PR as the risk that consumers actively perceive as a result of a lack of understanding of product information. Bauer, R. (1967) has additionally defined PR as the level of uncertainty among customers about the potential negative implications of employing new technology, which could deter adoption. Liébana-Cabanillas, F., Sánchez-Fernández, J. & Muñoz-Leiva, F. (2014) have further defined PR as the uncertainty or possible negative consequences of purchases, as perceived by new users.

Several studies have demonstrated that PR has negative effect on Behavioural Intention in using mobile payment. Yang, Y. et al. (2015) showed that PR has strong negative effects on perceived value and acceptance intention in using mobile payment. Phonthanakitithaworn, C., Sellitto, C. & Fong, M. (2016) have determined that PR has a negative effect on users' behavioral intentions to adopt mobile payment services. Noreen, M., Ghazali, Z. & Mia, M. (2021) shown that PR has a significant impact on adoption of mobile money services. Chen, W., Chen, C. & Chen, W. (2019) showed that PR has a negative impact on mobile payment adoption intention. Based on the explanation above, the following hypothesis is proposed: H7: Perceived Risk has a significant negative effect on Behavioral Intention

### The Influence of Perceived Cost (PC) on Behavioral Intention

PC is the perception that using mobile shopping is costly (Wei, T. et al., 2009). Perception of cost is one of the factors that has slowed down the growth of mobile shopping. In addition, PC is considered as one of the most significant barriers to the adoption of mobile payment (Anil, S. et al., 2003). Consumers' cost perception of using mobile payment could be considered as the total of the perceived cost of a cellular connection (including the cost of mobile internet access) and a smartphone itself (Phong, N., Khoi, N. & Le, A., 2018). In addition to these costs, learning cost should also be included.

This type of cost includes the time and effort needed to acquire, exchange and evaluate information (Mothersbaugh, D., Jones, M. & Beatty, S., 2000). Learning costs are considered transition costs that are incurred while shifting from one situation to a new situation such as learning to use a new information system (Kim, H., Chan, H. & Gupta, S., 2007). Furthermore, learning costs include non-monetary perceived costs which include sacrifices (time, effort and search costs) needed to obtain or use a product or service (Liu, J., Kauffman, R. & Ma, D., 2015).

Dai, H. & Palvia, P. (2009) have reported that perceived cost has a significant effect on the intention to adopt mobile shopping in China. A similar result has been obtained by Wei et al.'s (2009) research on the intention of consumers to adopt mobile shopping in Malaysia. Liu, Y. et al. (2019) also shown that Perceived Risk and Perceived Cost negatively affect a user's intention to use mobile payments. Based on these findings, the following hypothesis is proposed: H8: Perceived Cost has a significant negative effect on Behavioral Intention.

The eight variables are further divided into four categories: Intrinsic, Extrinsic, Facilitating and Inhibiting factors.

Table 1 provides the variables' definitions:

Behavioral Intention:	The desire to adopt mobile payment technology in online transactions. Adapted from Davis, F. (1989).
<b>Intrinsic factors</b>	
Hedonic Motivation:	HM is understood as “the fun or pleasure derived from using technology” Adapted from Venkatesh et al. (2012).
Habit:	Habit refers to the extent to which people tend to use technology automatically because of learning. Adapted from Limayem, M., Hirt, S. & Cheung, C. (2007) & Venkatesh et al. (2012).
<b>Extrinsic factors</b>	
Perceived Usefulness:	Perceived usefulness is defined as “the degree to which an individual believes that using a particular system will enhance user's job performance” Adapted from Davis et al. (1989).
Perceived Ease of Use:	PE is “the degree to which using technology will provide benefits to consumers in performing certain activities” Adapted from Venkatesh et al. (2012).
<b>Extrinsic factors</b>	
Social Influences:	SI measures the extent to which the influence/opinion of others influences the desire to adopt mobile payment technology. Adapted from Venkatesh et al. (2003).
Government Support:	Organisations' assessment of a country and its various institutions' preparedness to promote, support, facilitate, and regulate e-payment and its various requirements. Adapted from King, J. et al. (1994).
<b>Inhibiting factors</b>	
Perceived Risk:	Perceived risk is defined as the uncertainty or possible negative consequences of purchases, as perceived by new users. Adapted from Liébana-Cabanillas, F., Sánchez-Fernández, J. & Muñoz-Leiva, F. (2014).
Perceived Cost:	Perceived cost is the perception that using mobile shopping is costly. Adapted from Wei, T. et al. (2009).

### 2.3 SEM model with hypotheses path

Structural equation modeling (SEM) is a methodology for representing, estimating, and testing a network of relationships consisting of measured variables and latent constructs, and uses path analysis (e.g., regression) to test models and relationships among measured variables (Suhr, D., 2006). Structural Equation Modeling (SEM) describes the casual relationship between the variables and confirms the fitness of the evaluated model (Manoharan, B. & Shanmugam, V., 2017). Structural Equation Modeling (SEM) is relied upon to analyze the collected primary data in this article.

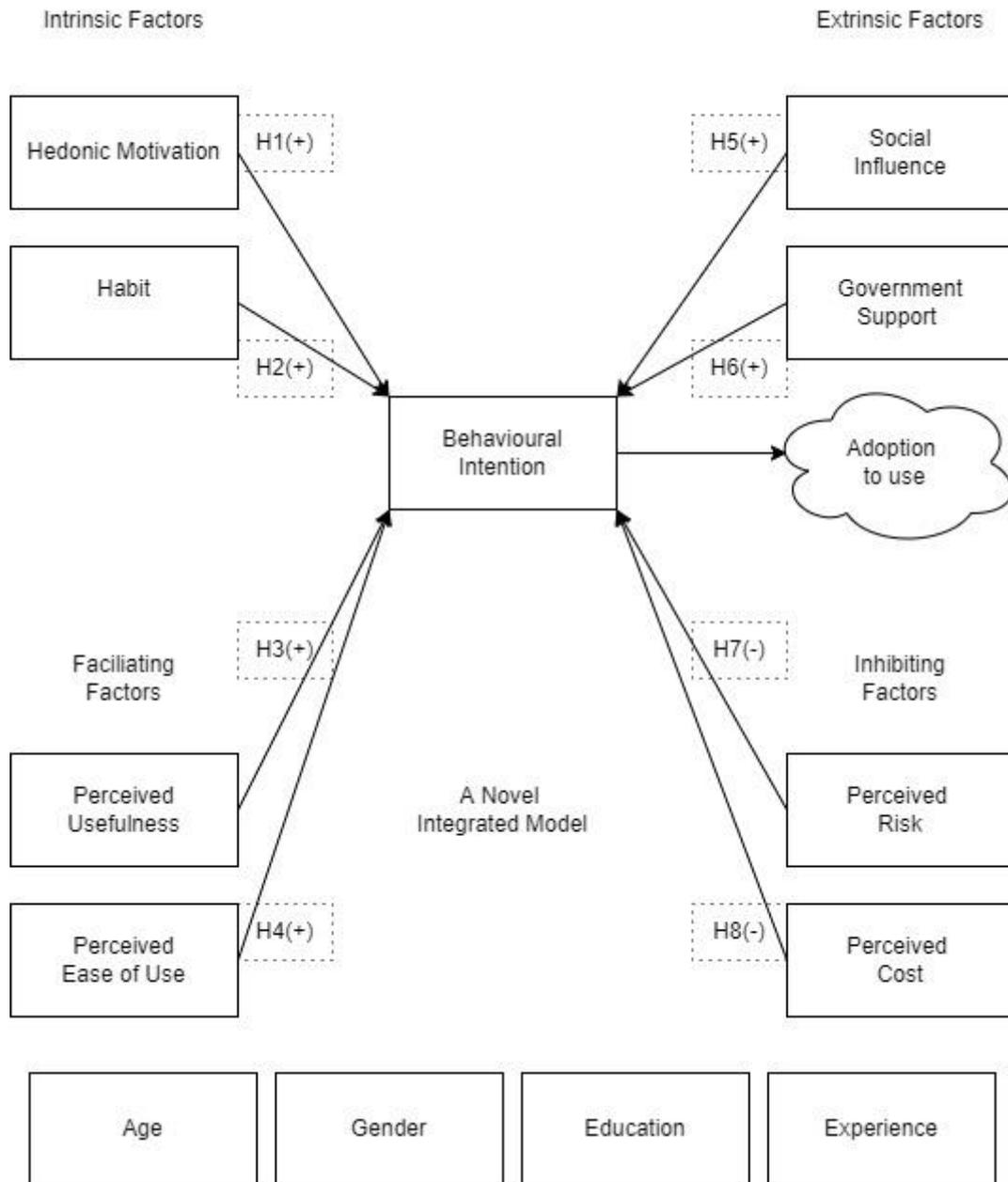


Figure 3. Novel Integrated Model with Hypotheses SEM

### 3. METHODOLOGY

#### 3.1 Research Design

The research approach relied upon in this study is quantitative. The Google Form questionnaire includes two sections: (Part A) demographics characteristics and basic information about mobile payment behavior of respondents; (Part B) 24 questions measuring eight variables on a 5-point Likert scale. Please refer to Table 2 for the questions.

#### 3.2 Sample and Procedure

For unlimited population:  $n = z^2 \times p(1-p) / \epsilon^2$

where

$z$  is the  $z$  score

$\epsilon$  is the margin of error

$p$  is the population proportion

For an exploratory study, a margin of error of  $\pm 10\%$  might be perfectly acceptable (Conroy, R., 2018). A 10% margin of uncertainty can be achieved with a sample of only 100, however, to obtain a 5% margin of error requires a sample of 384 (Conroy, R., 2018). In this study, a 7% margin of error is opted for. Using 95% confidence, a margin of error of 7%, assuming a population proportion of 0.5 with an unlimited population size, and a  $z$  value for a 95% confidence level of 1.96, the sample size for this study is as follows:

$$n = 1.96^2 \times 0.5(1-0.5) / 0.07^2$$

$$n = 196$$

By relying on the convenience sampling method, the link to the online Google Form has been distributed via WhatsApp and other social networking tools to participants in Hong Kong, mostly aged between 20 to 60 years old. The data collection period was from 28 March to 8 April 2022. The targeted respondents might have used or never used mobile payment. The collected data has been analyzed with Excel by "Analysis ToolPak" and PAST (Paleontological Statistics). The hypotheses with the coefficient of determination ( $R^2$ ) have been tested with Structural Equation Modeling (SEM). Face and content validity have been tested by Brittany University's Professor and pre-test.

#### 3.3 The Questionnaire

This study consists of 24 questions or measurements that focus on eight different variables. Hedonic Motivation (HM) questions are adapted from Venkatesh et al. (2012), Oliveira et al. (2016) and Nur, T. & Panggabean, R. (2021). Habit (HB) measurements are adapted from Venkatesh et al. (2012) and Dri Handarkha, Y. et al. (2021). Perceived Ease of Use (PE), Perceived Usefulness (PU), Social Influences (SI), Perceived Risk (PR) and Perceived Cost (PC) measurements are adapted from Venkatesh et al. (2012), Nur, T. & Panggabean, R. (2021) and Abrahão, R., Moriguchi, S. & Andrade, D. (2016). Government Support (GS) questions are adapted from the information of HKSAR (2021) and the author.

A pilot test of this questionnaire has been conducted with 10 participants to ascertain its suitability. Subsequently, the amended questionnaire has been relied upon as a measurement scale for the actual survey. The first part contains questions about demographics, while the second part includes questions about the research model. A Likert scale question has been used with a range from 1 to 5 (1 = "Strongly Disagree" to 5 = "Strongly Agree"). The list of questions is shown in Table 2.

Table 2. List of Questions

Variables		Questions / Measurements	References
Hedonic Motivation	HM	HM1: I think that using mobile payment is fun. HM2: I enjoy using mobile payment. HM3: I feel happy when I use mobile payment to make payment	Adapted from: Venkatesh et al. (2012); Oliveira et al. (2016); Nur, T. & Panggabean, R. (2021)
Habit	HB	HB1: The use of mobile payment app has become a habit for me. HB2: I will intend to continue using mobile payment. HB3: I often use AliPay, WeChatPay or another mobile payment app.	Adapted from: Venkatesh et al. (2012); dri handarkha, Y. et al. (2021)
Perceived Usefulness	PU	PU1: I think that mobile payment is a useful service in my day-to-day activities. PU2: I think that mobile payment is useful for me when making payment. PU3: I think that using mobile payment can increase the efficiency of paying.	Adapted from: Venkatesh et al. (2012); Nur, T. & Panggabean, R. (2021); Abrahão, R., Moriguchi, S. & Andrade, D. (2016)
Perceived Ease of Use	PE	PE1: I think that mobile payment is easy to use. PE2: I think that using mobile payment is clear and easy to understand. PE3: I can easily use mobile payment to make payment.	Adapted from: Venkatesh et al. (2012); Nur, T. & Panggabean, R. (2021); Abrahão, R., Moriguchi, S. & Andrade, D. (2016)
Social Influence	SI	SI1: The people who are important to me think that I have to use the mobile payment service to make payment. SI2: Friends around me who use mobile payment services encourage me to use mobile payment. SI3: I believe that using mobile payment can improve my social status.	Adapted from: Venkatesh et al. (2012); Nur, T. & Panggabean, R. (2021); Abrahão, R., Moriguchi, S. & Andrade, D. (2016)
Government Support	GS	GS1: I would use more mobile payment if more government departments were willing to allow people to make payments through mobile payment. GS2: I would use more mobile payment if the Government adopted more measures to settle bills via mobile payment. GS3: I would use more mobile payment if the government promoted more contactless payment in public markets.	Adapted from: HKSAR (2021); author
Perceived Risk	PR	PR1: I do not feel completely safe to provide personal information through the mobile payment system. PR2: I am worried about the use of mobile payment services because other people might be able to access my data. PR3: I do not feel protected when sending confidential information via the mobile payment system.	Adapted from: Venkatesh et al. (2012); Nur, T. & Panggabean, R. (2021); Abrahão, R., Moriguchi, S. & Andrade, D. (2016)
Perceived Cost	PC	PC1: I believe that it is expensive to use mobile payment. PC2: I have financial barriers (e.g. purchase of telephone and data connection expenses) affecting my ability to use mobile payment services. PC3: It takes a lot of time to learn how to use mobile payment.	Adapted from: Venkatesh et al. (2012); Nur, T. & Panggabean, R. (2021); Abrahão, R., Moriguchi, S. & Andrade, D. (2016)
Behavioral Intention	BI	BI1: I intend to continue using the mobile payment for making payment in the future. BI2: I will continue using the mobile payment in my daily life. BI3: I will often use the mobile payment when making payment.	Adapted from: Venkatesh et al. (2012); Nur, T. & Panggabean, R. (2021); Dalimunte, I. et al. (2019)

## 4. RESULTS

### 4.1 Reliability and Convergent Validity Test

This study employs the two-step approach to perform an evaluation of the quality of the collected data (Anderson, J. & Gerbing, D., 1988). Reliability analysis has been conducted using Cronbach's Alpha. As suggested by Hair, J. et al. (2010), a Cronbach's Alpha value greater than 0.7 demonstrates that the factor has high reliability. The reliability of all factors in this study as shown in Table 4 has a Cronbach's Alpha value greater than 0.7, reflecting good internal consistency of the items in the scales. Furthermore, the Average Variance Extracted (AVE) of HM, HB, PU, PE, SI is greater than 0.6 (Fornell, C. & Larcker, D., 1981). From the same table, the Composite Reliability (CR) also shows that all positive constructs have high levels of internal consistency reliability.

### 4.2 Results

A total of 203 participants responded to the questionnaire, with a response rate of 83%. The proportion of females and males was 49.3% and 50.7% respectively. A total of 39% respondents used mobile payment services for less than one year while 10.3% never resorted to them prior to the survey. The majority (61.1%) of the respondents used mobile payments for more than one year. Most users relied primarily on credit cards in their daily life (35.5%). 32% of the respondents used Octopus, followed by AliPay, Cash, WeChatPay and ApplePay. The full profiles of the respondents are shown in Table 3. This study relies on Microsoft Excel and Paleontological Statistics Software Package (PAST) to test the proposed hypothesis. Factor Loadings, Composite Reliability, and Average Variance Extracted can be found in Table 4.

As indicated, this study aims to identify the factors influencing users' interest in adopting mobile payment in Hong Kong. The hypothesis test result can be seen in Table 5. The Novel Integrated Model with Loadings can be found in figure 4. The results show that the Hedonic Motivation (HM), Habit (HB), Perceived Usefulness (PU), Perceived Ease of Use (PE), Social Influence (SI) and Government Support (GS) have a significant influence on the Behavioral Intention whereas the Perceived Risk (PR) and Perceived Cost (PC) do not show negative influence on the Behavioral Intention. More details and interpretation will be provided in Section 5.

### 4.3 Tables and Figures

Table 3: Demographic Results

Demographic variables		Frequency	Percent
Gender	Female	100	49.3%
	Male	103	50.7%
Age	Less than 21	11	5.4%
	21 – 30	31	15.3%
	31 – 40	45	22.2%
	41 – 50	59	29.1%
	51 – 60	32	15.8%
	More than 60	25	12.3%
Marital status	Single	106	52.2%
	Married	97	47.8%
	Other	0	0%
Education	Never	4	2.0%
	Primary / High School	63	31.0%
	Secondary	69	34.0%
	Tertiary	67	33.0%
Occupation	Employee	106	52.2%
	Self-employed	52	25.6%
	Student	21	10.3%
	Others	24	11.8%
Number of years to hear or use mobile payment	Never	21	10.3%
	Less than 1 year	58	28.6%
	1 – 2 years	67	34.0%
	3 – 5 years	38	18.7%
	More than 5 years	17	8.4%

Type of payment most frequently use	Cash	17	8.4%
	EPS	2	1.0%
	Octopus	65	32.0%
	Credit Card	72	35.5%
	AliPay	21	10.3%
	WeChatPay	11	5.4%
	Apple Pay	9	4.4%
	Tap and Go	3	1.5%
	Others	3	1.5%

Table 4: Reliability and Validity Analysis

Construct	Loadings (Correlate with Behavioral Intention)	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Hedonic Motivation (HM)	0.870	0.962	0.904	0.759
Habit (HB)	0.888	0.960	0.919	0.792
Perceived Usefulness (PU)	0.896	0.972	0.924	0.803
Perceived Ease of Use (PE)	0.852	0.972	0.888	0.726
Social Influence (SI)	0.798	0.970	0.841	0.639
Government Support (GS)	0.765	0.969	0.809	0.586
Perceived Risk (PR)	0.303	0.943	0.233	0.092
Perceived Cost (PC)	0.137	0.926	0.054	0.020
Behavioral Intention (BI)	1	0.965	1	1

Table 5: Hypothesis Testing Results

Hypothesis	Relationship with Behavioral Intention	Standard Error	Decision
H1: Hedonic Motivation (HM)	HM > +BI	0.204	Supported
H2: Habit (HB)	HB > +BI	0.167	Supported
H3: Perceived Usefulness (PU)	PU > +BI	0.186	Supported
H4: Perceived Ease of Use (PE)	PE > +BI	0.256	Supported
H5: Social Influence (SI)	SI > +BI	0.319	Supported
H6: Government Support (GS)	GS > +BI	0.349	Supported
H7: Perceived Risk (PR)	PR > -BI	0.594	Not-supported
H8: Perceived Cost (PC)	PC > -BI	0.576	Not-supported

Table 6: Inter Correlation Analysis

	HM	HB	PU	PE	SI	GS	PR	PC	BI
HM	1								
HB	0.942	1							
PU	0.932	0.950	1						
PE	0.920	0.927	0.961	1					
SI	0.917	0.901	0.928	0.949	1				
GS	0.890	0.886	0.916	0.939	0.946	1			
PR	0.570	0.582	0.587	0.587	0.577	0.587	1		
PC	-0.386	-0.373	-0.393	-0.422	-0.403	-0.397	-0.182	1	
BI	0.967	0.978	0.973	0.949	0.920	0.901	0.581	-0.391	1

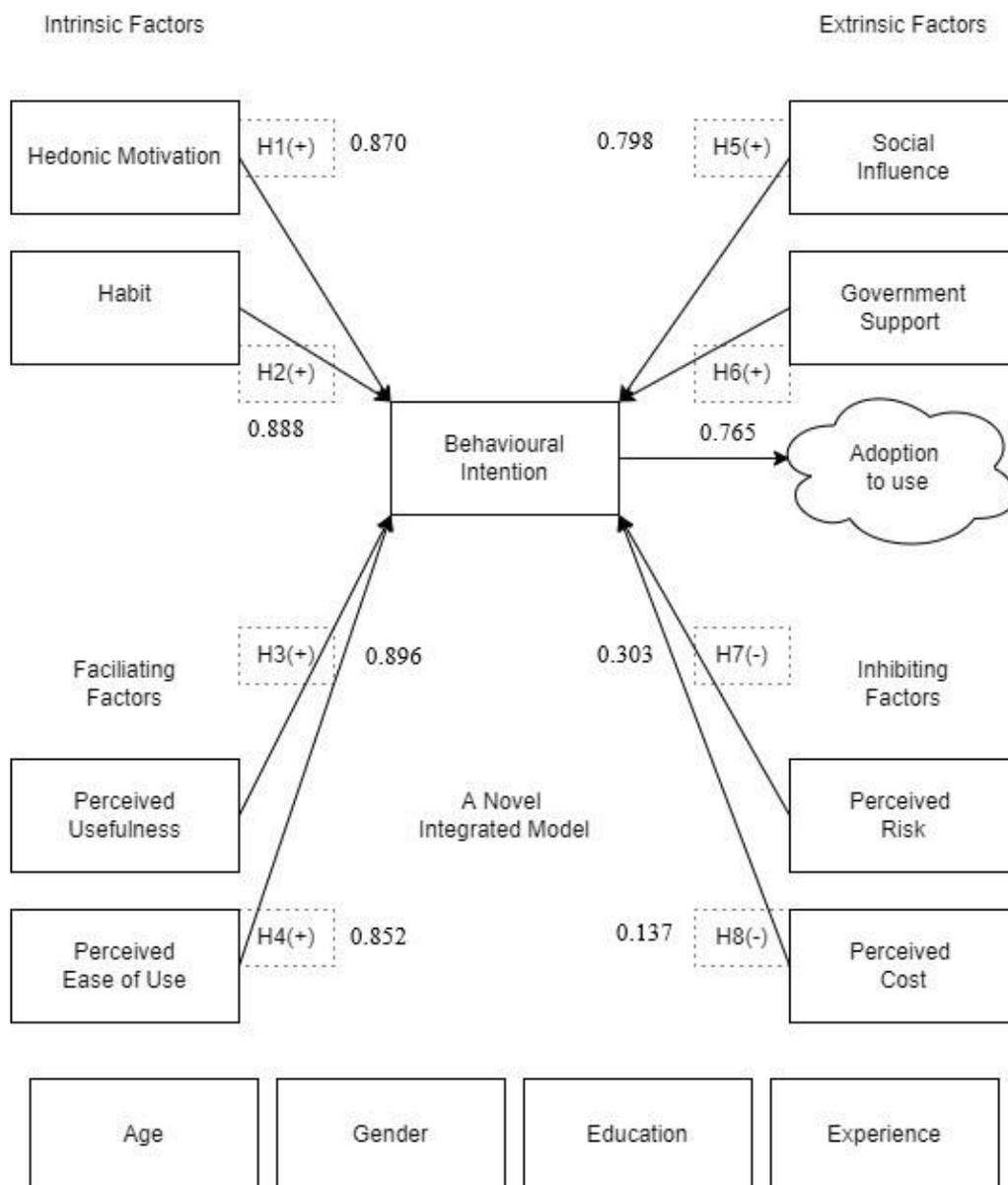


Figure 4. Novel Integrated Model with Loadings

## **5. DISCUSSION**

### **5.1 Discussion**

In this study, six out of eight hypotheses are supported. The findings shed light on the importance of consumers' usage patterns in determining whether or not they are likely to continue to use mobile payments. The analysis is as follows:

#### **H1 HM1**

The results of this study suggest that Hedonic Motivation (HM) has a significant positive effect on Behavioural Intention. This is in line with previous research (Sharif, A. & Raza, S., 2017); (Widyanto, H., Kusumawardani, K. & Septyawanda, A., 2020); (Hwang, Y. & Kim, D., 2007) and (Khatimah, H., Susanto, P. & Abdullah, N., 2019), where HM is shown to have a significant positive effect on Behavioural Intention to use mobile payments. When a person feels that mobile payment transactions are fun, he/she is more likely to engage in them. The various products and brands available in mobile payment create a pleasurable experience that stimulates one's interest in buying. There are underlying psychological elements causing such activity to be perceived as enjoyable (Chin, L.P. & Ahmad, Z., 2015). The more enjoyable the mobile payment experience, the stronger the intention to adopt mobile payment as new technology (Priporas, C., Stylos, N. & Fotiadis, A.K., 2017).

#### **H2 HB**

Habit is found to be the most important factor that significantly and positively influences the intention to use mobile payment in this study. This finding is found to be consistent with previous studies by Kim, S. & Malhotra, N. (2005); Yu, G., Qi, Q. & Cho, N. (2019) and Jia, A., Song, X. & Hall, D. (2020). This research finds that users are more willing to rely on mobile payment when it is consistent with their living habits. According to the results, consumers who have formed the habit to use mobile services are more likely to form the habit of using mobile payments. Some people may have been using cash and credit cards to pay for services and goods for their entire life. It is a challenge for businesses to introduce their service when implementing their mobile payment solutions. In order to encourage consumers to use their mobile payment services, companies or service providers should take steps to sustain the necessary habit formation.

#### **H3 PU**

The result obtained is that “Perceived Usefulness” has a significant positive influence on Behavioural Intention to use mobile payments. As mobile payment is more convenient and efficient than traditional payment methods, users in Hong Kong give priority to using mobile payment services, and these results are consistent with those of Mun, Y., Khalid, H. & Nadarajah, D. (2017); Kim, C., Mirusmonov, M. & Lee, I. (2010); To, A. & Trinh, T. (2021) and Sanaji, Indarwati, T. & Candra, I. (2021). According to this argument, if users discover that mobile payment leads to a likely improvement in the handling of their transactions, they are more likely to adopt it.

#### **H4 PE**

The more people believe that a particular technology is easy to use, the greater the propensity to use it. As a result, people are becoming more interested in using mobile payment services, particularly when they are confident that the service would help them with their online transactions. The more confident a person feels that technology is simple to learn and master, the more likely he/she is to use it. When mobile payment is more convenient and efficient than traditional payment methods, users will give priority to using mobile payment services, and these results are consistent with those of Roseli, N. et al. (2021); Mun, Y., Khalid, H. & Nadarajah, D. (2017) and Malik, A. & Annuar, S. (2021).

#### **H5 SI**

Social Influences have a significantly positive effect on Behavioural Intention. The stronger the influence of friends and family on the use of mobile payment services, the more likely consumers are to adopt this technology. The findings are in line with previous research (Musa, A., Khan, H. & Alshare, K., 2015; Nur, T. & Panggabean, R., 2021). The positive influence of SI suggests that people can easily be persuaded to opt for purchases using mobile payments, especially given the convenience of this mode of payment. Yang, J., He, X. & Lee, H. (2007) suggested that people who act as peer group serve as a reference to determine whether or not they want to use mobile payments. Putri, A., Handayani, P. & Shihab, M. (2020) found that the greater the interest in using information technology due to the strong influence of the social environment, the more likely potential users to rely on mobile payments. In other words, the fulfilment of the expectations of consumers towards technology is likely to directly support continuing usage of mobile payment services.

#### **H6 GS**

Previous research results have shown that “government support” has a positive impact on adoption intention. Since government support has a significant positive impact on adoption intention, it is found that the higher the degree of

government support for mobile payments, the more likely users are to rely on mobile payments, which is consistent with the results of Sleiman, K. et al., 2021; Nishimura, Y., 2020; Chua, C. et al., 2020).

#### **H7 PR**

Previous studies have shown that “Perceived Risk” has a negative impact on “adoption intention” (Yang, Y. et al., 2015; Phonthanakitithaworn, C., Sellitto, C. & Fong, M., 2016; Noreen, M., Ghazali, Z. & Mia, M., 2021; Chen, W., Chen, C. & Chen, W., 2019). Surprisingly, this study suggests that “Perceived Risk” does not have negative effects on mobile payment adoption. This means that users are not concerned about the safety of information transmission when relying on mobile payment in Hong Kong. They are also not concerned about the threat and inconvenience caused by the mobile system problems in the payment process.

#### **H8 PC**

Again, similar to the results of “Perceived Risk”, this study has found that “Perceived Cost”, including the cost of mobile phone, internet fee and learning cost, does not have a negative effect on using mobile payments. This result is not consistent with previous studies such as Dai, H. & Palvia, P. (2009); Wei et al. (2009) and Liu, Y. et al. (2019). This means the users in Hong Kong are not unduly concerned about cost as they may be using a mobile phone and paying the related fee already.

### **5.2 Theoretical Implications**

This study has provided a research framework for a better understanding of the factors facilitating or inhibiting the adoption of mobile payments among users in Hong Kong. There are several implications for research emerging from this study. First, despite the fact that the TAM/UTAUT has been extensively studied in the previous research on mobile payment services, little work has been done to combine and investigate other potentially relevant factors (e.g. Perceived Risk, and Perceived Cost) in order to test their impact on the intention to adopt mobile payment. Consequently, this study’s contribution stems from the creating and testing of a novel integrated model. Second, Government Support for mobile payment service adoption has been rarely addressed in previous research. However, the findings of this study show that Government Support is an essential component of adoption intention. As a result, to improve the explained power of mobile payment service adoption intention, this study incorporated government support into the research model. Third, the eight variables studied have been further divided into 4 categories: Intrinsic, Extrinsic, Facilitating and Inhibiting factors. In other words, this study has offered a comprehensive framework for determining the willingness of consumers to adopt mobile payment services in Hong Kong. The corollary is that this study furnishes a useful basis to assist researchers investigating issues related to mobile payment services in Hong Kong.

### **5.3 Managerial implications**

According to the empirical findings of this study, Hedonic Motivation, Habit and Perceived Usefulness are the three most important variables that affect users’ adoption of mobile payment in Hong Kong. Therefore, it is suggested that enterprises/companies operating mobile payment services could attract more consumers by focusing on these three factors. To fruitfully promote mobile payment adoption business planners should carefully lay the grounds for habit formation. This could be achieved by making the app a greater source of fun through the addition of built-in lucky draws or mini-games, by making mobile payment transaction systems simpler and more convenient, and by engaging in promotion activities such as the collection of stamps exchangeable into discounts or the offering of coupons so to turn customers into daily users. The main objective is to increase the acceptance of mobile payments and make users rely on these devices more frequently. The service provider could provide a promotion or cash rebate when customers pay for their purchase with mobile payment apps. In addition, Social Influence and Government Support play an important role. Companies could consider providing incentives to invite friends or family members. The government could introduce more bills, e.g. Rates, Gas, Electricity bills, to be paid via mobile payment systems. Companies could take the lead and cooperate with the government to organize programs related to mobile payment or encourage their customers and staff to engage with the program. Although this study suggests that perceived risk does not affect the use of the mobile payments, service providers should continue to reduce the perceived security risks in mobile payment transaction systems, in order to reduce customers’ fear of the perceived risks as found in other studies. This means that mobile network operators and the government should undertake the necessary investment to ensure the development and maintenance of a stable and secure payment infrastructure. Minimizing the risk in the transaction process and providing authentication may reinforce users’ intentions to use mobile payment services.

### **5.4 Limitations and Future Research**

Based on the results of this study, the following cautionary notes are offered. First, data were collected by using a self-report questionnaire, therefore, there is scope for common method biases (Podsakoff et al., 2003). Time and cost

considerations may restrict the data collection options leading to the use of a single questionnaire survey. The best option to prevent this is to use two or more information sources to gather data about the constructs or variables in the study. Alternatively, researchers might collect the data at different points in time, in different locations or by using different media Rodríguez-Ardura, I. & Meseguer-Artola, A. (2020). Second, even though statistical results support generalizability when the sample size is greater than 200, larger samples may strengthen the explanatory power of this and similar studies. Third, the results of this study show that both “Perceived Risk” and “Perceived Cost” do not have a significant impact on users’ adoption of mobile payments. As this is inconsistent with some previous studies, it is suggested that further investigations be conducted to confirm the findings. In addition, as this study has not undertaken a thorough investigation of users belonging to different demographic categories (e.g., gender, education, usage experience, and the like) in relation to adoption of mobile payment services, further investigation focusing on different user groups may be warranted.

## 6. CONCLUSIONS

To conclude, there is a significant positive influence relationship between “Hedonic Motivation”, “Habit”, “Perceived Usefulness”, “Perceived Ease of Use”, “Social Influence”, “Government Support” and “Behavioural Intention”, which illustrates that consumer intention to use mobile payment will be more positive with a higher degree of recognition by others, better resource adequacy, a higher degree of pleasure with technology, greater ease of use of the operating process, more benefits brought by technology, and greater attraction to others’ attention. Some findings are out of expectation. “Perceived Risk” and “Perceived Cost” do not have a direct negative effect on their intention to continue using mobile payments.

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