

# The Determinants Factors of Mobile Payment Adoption in DKI Jakarta

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**Abstract-** *The escalating growth in the usage of smartphone stimulates business people to innovate with technology, one of the ways is by developing a cashless payment system using cell phones or commonly referred to as mobile payment. Substantial amount of service providers in many countries, particularly Indonesia, has offered mobile payment with various benefits. Hence, this research comprised a study of user behavior towards the implementation of information technology by using a framework model which adopted by using the UTAUT (Unified Theory of Acceptance and Use of Technology) model. To collect the data, questionnaires were distributed through online channels with internet users as potential respondents. This research uses explanatory design with convenience sampling method. Firstly, data were obtained from 30 respondents through online channel and the pre-test result stated that the user interface of mobile payment has a significant effect on the use of MP. From the pre-test result mentioned, questionnaires were redistributed and collected. From this, a total of 220 questionnaires from respondents in DKI Jakarta has been obtained and the majority of respondents have acknowledged the presence of mobile payment. Data processing is conducted by using SmartPLS 3.0 software. This research verified that perceived risk and cost factors are the main disruptions that cause the low adoption rate on the usage of mobile payment in Indonesia, and that social influence has proven to be a highly crucial, driving factor for users in using mobile payment. Word of mouth communication, promotion by Brand Ambassadors and celebrities can be used as recommendations by service providers to formulate better strategies.*

**Keywords-** *mobile payment adoption; UTAUT framework; DKI Jakarta; drivers; barrier*

## 1. INTRODUCTION

The use of cell phones, particularly smartphones, has dramatically increased in recent years. Moreover, smartphones can be used like small computers. Smartphones have become a matter that is inseparable from its users, its serves more than just communication devices. Due to the high penetration rate of smart mobile devices, some market players remarked several opportunities in the spread of various types of cellular services. This device is commonly referred to as a mobile payment (MP). These digital online payment methods may assist consumers in making transactions easily in the virtual world [5].

However, a private research institute, Statista, released a data on digital payment transaction values in the year of 2018, reaching to \$ 3.4 trillion worldwide, whereas Indonesia has only contributed to the amount of \$ 22.4 billion. This is highly far compared to China with the value of \$ 1.2 trillion, followed by the United States at \$ 884 billion, Japan at \$ 151 billion, Britain at \$ 149 billion and Germany at \$ 112 billion. Even India has a digital payment transaction value of up to \$ 50 billion, two times greater than Indonesia. In fact, Indonesia still owns the

potential of being able to develop access to payment system services by looking at the large geographical and population conditions. Technological developments that expanded into the financial sector also moved rapidly with the presence of financial technology (fintech) in line with the Gerakan Nasional Non-Tunai (GNNT/Non-cash National Movement) to manifest Less Cash Society (LCS). Based on the results of the survey on 2017, the ownership of smartphone and tablet devices is based on the characteristics of consumers who live in cities at 70.96% [16]. The spread of smartphone devices since 2010 has assisted the improvement of MP services in Indonesia. The massive increase in the operating system and user's direct display combined with reliable cellular internet connectivity, has enabled a significant transformation of MP services. The moment and the experience of mobile payment processing has increased materially when customers increase the USSD code-based services to the application-based services. Various cases on the usage are also expanded because application-based platforms allow the embedding of MP services to other application services, such as chatting and social media services [15].

Mobile payments are digital payments that are used to pay goods, services and bills using a single mobile device, such as mobile phones, smartphones, or personal digital assistants (PDAs) by utilizing wireless technology and other communication technologies. As a novel payment method, mobile payments own conceptual guidelines and new payment trends. This can have a significant impact on credit and debit cards because MP may replace card payment methods and it may generate a more convenient payment process. This mobile payment takes advantage of smartphone users where people prefer to carry their cell phones rather than cards[10]. The main focus of these electronic purchases is to minimize the possibility of user data information from credit cards and debit cards being damaged or misused by hackers or criminals.

China is one of the countries that has successfully implemented a payment system with the use of QR Code. The use of QR Code as a payment method in China is classified as massive. Based on the results of research conducted by iResearch Consulting Group, the number of payment transactions using the QR Code in 2017 has reached US \$ 5.5 trillion. WeChat Pay is one of the second largest QR Code payment products in China which has 650 million users in 2017. In Indonesia, QR Code transactions have been introduced by Bank BCA through BCA Sakuku, Gojek through Go-Pay, Lippo Group through OVO, and much more. The development of smartphone-based fintech in MP is inseparable from the rapid development of smartphones in Indonesia. The use of Go-Pay in GoJek which was recently launched in 2016 is a widely used example when compared to payment services that are launched earlier, such as T-Cash by Telkomsel and E-Cash by Mandiri. The relationship between GoJek payment services relates to the lifestyle of its own users. This proved to be a strong combination with its usage. Certainly, most traditional cellular payment services have followed the era and turned into application-based payment services, where many of them have succeeded in building platforms with relevant daily use cases today.

Previous research in Indonesia explained that performance expectations did not significantly affects the intention in using information systems and using information systems[3]. Another research has also contributed to the industrial world and research related to the adoption of cellular payments[31]. From the industrial side, the results of this research may assist the industry to better understand expectations as well as consumer factors that may affect the use of cellular payments. Another research in Brazil indicated that cellular payments may provide benefits such as opportunities to save time, provide comfort and new experiences for consumers for cellular phone users in the payment process [1]. Previous research[20] suggested that service providers should not merely pass the time to pay attention towards the ease in using MP, but performance expectancy and social influences that are stated as drivers must also be strengthened. Because users pay more

attention to what benefits can be obtained while using MP. Whereas for perceived risk and cost factors which are considered as barriers, MP service providers must pay much more attention to brand images and customer satisfaction. This kind of research has never been conducted in Indonesia before. From the previous data mentioned above, it can be seen that the penetration of smartphone users in Indonesia is relatively large, but somehow, there are merely few Indonesians who are using cash payments. This research has never been conducted previously in Indonesia.

This research comprised a study of user behavior towards the implementation of information technology by using a framework model that adopts the UTAUT (Unified Theory of Acceptance and Use of Technology) model. The UTAUT model is an information technology acceptance model developed based on previous theories and models, namely the theory of reasoned action (TRA), theory of planned behavior (TPB), technology acceptance models (TAM), and task-technology fit theory. The UTAUT model itself is tested to show the context of specific area regarding technology acceptance. The UTAUT model examined the determinants of user acceptance and usage behavior which consists of performance expectancy, effort expectancy, social influence, and facilitating conditions, and explains that the four matters are related to usage behavior, both directly or through behavioral intention.

## **2. REVIEW OF LITERATURE**

### **2.1 UTAUT Model**

UTAUT model has reviewed and identified the eight main theoretical models that explains the acceptance of technology [28]. The eight theories include the Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Theory of Acceptance Model (TAM), Motivational Model (MM), Combined TAM and TPB, Model of PC Utilization (MPCU), and Social Cognitive Theory (SCT). UTAUT is developed as a comprehensive synthesis of prior technology acceptance research. UTAUT consisted of four key construct, namely performance expectancy (PE) which is defined as the level in which the usage of technology benefits the consumer in carrying out certain activities, effort expectancy (EE) defined as a level of convenience related to consumer technology, social influence (SI) interpreted as the extent to which consumers perceived that they must use particular technology, and facilitating conditions (FC) refer to consumer perceptions of resources and support for influencing behavior[28]. The variables that can be categorized as supporting factors include performance expectancy, effort expectancy, social influences, and facilitation conditions that influence the intention in using mobile payments.

### **2.2 Performance Expectancy**

Performance expectancy is the degree to which individuals believe that using certain system may assist

them on improving their performance. The use of mobile applications creates faster process on any work related to finance, time-saving, and the use of payment applications is relatively safe. With the ease provided by these applications, many activities can be carried out in a day[1]. The use of mobile banking has a highly positive effect on the performance of the user. The use of mobile banking applications also has a significant effect on the sale of gadgets and because the mobile banking feature is considered as a safe device, it drives the society to use it [4]. Mobile payments assist many people to gain profits, including making it easier to carry out financial transaction activities so that many people adopt the system in their daily activities [19]. From the results above, we draw the following hypothesis:

H1: Performance expectancy positively affects behavioral intention in mobile payments.

### **2.3 Effort Expectancy**

Effort expectancy may provide ease of use of the system which may reduce the effort of the user (energy and time) in doing their work. Online payment, which is usually conducted by using a gadget or frequently referred to as mobile banking. In theory, if the payment system is conducted easily, then many people are willing to use it[26]. The use of the mobile banking application has a highly positive effect on effort expectancy because of its ease in using the application. The mobile banking application is also classified as user-friendly, so it may encourage many people to use online payment applications because of the ease and accuracy [12]. The use of mobile banking or mobile payment application makes it very easy for many people to make transactions. This is because this application uses a system that is easily understood by many people so that it has a positive effect on business expectations [24]. Therefore, we draw the following hypothesis:

H2: Effort expectancy positively affects behavioral intention towards mobile payments.

### **2.4 Social Influence**

Social influence is defined as the extend to which individuals consider important people around them, such as family and friends to influence individuals to use a system [28]. The influence of a classmate on the use of mobile payment has a strong influence and enticement. This is reinforced by the experience on the ease perceived in the use of this application, and also the risk that tends to be low[13]. A technology may provide a positive impact when utilizing social networks because they will have more intentions [17]. Moreover, social influences have a stronger impact on women than men. From the results above, we draw the following hypothesis:

H3: Social influence positively affects behavioral intention towards mobile payments.

### **2.5 Facilitating Conditions**

Facilitating condition is one of the main variables of the UTAUT model which has a direct relationship with the

adoption use. This can be interpreted as an infrastructure that supports a system [28]. Facilitating conditions compare all attributes on the usage to access the internet based on prices in using technology [2].

H4: Facilitating conditions positively affect the actual use of mobile payments.

### **2.6 Behavioral Intention**

Behavioral intention is interpreted as when an individual's plans to do or not to do something in the future. Payments using mobile payment have attracted many people. This begins with the behavior intention in adopting the application [21]. In the use of mobile payment features in various countries and cultures, based on empirical studies, as much as 70% of application use is influenced by behavioral intentions[11]. The strongest indicator from a managerial point of view about mobile payment applications is behavioral intention. This is based on the behavior of many people[27]. Based on the results above, we draw the following hypothesis:

H5: Behavioral intention positively affects the actual use of mobile payments.

There are several variables which are grouped into inhibiting factors, namely perceived risk and cost towards the one's behavioral intention in using mobile payments.

### **2.7 Perceived Risk**

Consumer's risk perception comes from feelings of uncertainty or anxiety about the behavior and the final result of consumer behavior itself. The characteristics of mobile payment indicated that consumers may experience similar potential risks, such as vulnerability to security that comes from wireless communication [23]. In addition, the complexity on the use of mobile payments, with a variety of different technological offerings has made consumers feel confused and in the end may improve the perception of risk in terms of technology [7]. By considering this matter, the perceived risk is a major barrier to use mobile payments, we therefore propose:

H6: Perceived risk negatively affects behavioral intention in the usage of mobile payment.

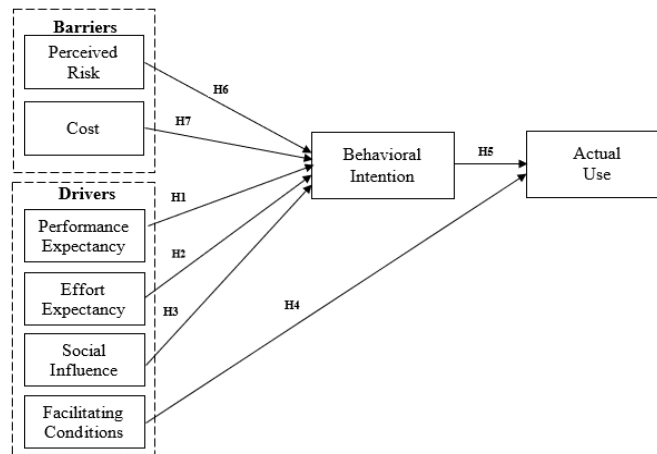
### **2.8 Cost**

Cost is also considered a crucial factor that greatly influence the use of mobile payments in several studies [20]. These costs include costs for accessing, transaction costs, and costs of using mobile devices [14]. When compared to traditional payment systems, user intention in adopting mobile payments is negatively affected by costs [20]. Therefore, we draw the following hypothesis:

H7: Costs negatively affect behavioral intention in the use of mobile payment.

Based on the hypothesis that has been written above, the author divided several variables as supporting factors and obstacles in the use of mobile payments. This research model can be described in Figure 1.





**Figure 1. Research Model**

### 3. METHODOLOGY

The quantitative research method was chosen for this study. Quantitative research is a research method based on the philosophy of positivism, used in researching the sample and the research population[22]. In this research, researchers used explanatory research designs or hypothesis testing because we wanted to test theories and hypotheses that had been tested in previous studies. Explanatory research fundamentally explains how a social phenomenon may occur. This research is classified as a cross-sectional study because the research was conducted in a certain period of time and only observed phenomena to answer research questions. In this research, researchers appointed several participants of Internet users in Indonesia who have previously used mobile payments in their daily lives as a research population. Internet users are chosen as potential respondents because of its use, mobile payments are payments that use internet-based systems and technologies. In this research, researchers used non-probability sampling techniques.

For this research, researchers used convenience sampling, in which this sampling technique carried out by obtaining respondents who are easily available[33]. Samples in this research were devoted to mobile users who have been actively using digital payment services (GoPay, Grab Pay, OVO, T-Cash) in the Jakarta area. Number of sample

must be adjusted to the number of indicators, assuming  $n \times 5$  observed variables up to the  $n \times 10$  observed variables [9]. In this study, the number of question items used to measure 8 variables, with the number of respondents used was 35 statement items multiplied by 5 equals to 175 respondents. This research managed to obtain 250 respondents, in which the results of questionnaires from 30 respondents were used as a pre-test. Therefore, this research engaged a sample of 220 samples due to the time constraints in collecting the data from respondents. The research location which is the scope of the researchers about this research is the city of Jakarta because Jakarta is the first city for the movement of non-cash payments [6]. The choice of location of the research was due to the dominating internet users, namely in DKI Jakarta, amounting to 58.08% of the total population of 262 million Indonesians. And the use of smartphone devices used to access the internet is based on the character of consumers who live in urban areas by 59.31% [16].

Researchers used a Likert scale that may indicate the attitude of respondents by looking at how much respondents agree or disagree with the statements that have been formed starting from very positive to negative attitudes[33]. The measurements of each variable in this research include:

**Table 1. Construct and Measurement Model**

Variable	Indicator
Perceived Risk (PR)	R1. I am afraid of faultiness in the function of MP.
	R2. I am afraid of exposure of privacy if using MP.
	R3. I am afraid of unreasonable of fraudulent charges if using MP.
	R4. I am afraid for waste of time when using MP.
Cost (C)	C1. I think my cellular cannot make for MP.
	C2. I think it's expensive to buy a new phone for MP.

	C3. I think the access cost is expensive of using MP.
	C4. I think the cost is very high to access the MP system.
	C5. I think the transaction fee is expensive for using MP.
Performance Expectancy (PE)	PE1. I think MP is useful for me to buy products or services.
	PE2. I think MP makes it easier for me to buy products or services.
	PE3. I think MP saves time for me to buy products or services.
	PE4. I think MP is more prompt than other payment patterns.
	PE5. I think MP can make things better than other payment systems.
Effort Expectancy (EE)	EE1. I think using MP is easy.
	EE2. I think it is easy for me to learn how to use MP.
	EE3. I think the user's interface of MP is friendly.
	EE4. I don't think it will spend much time in learning to use MP.
Social Influence (SI)	SI1. My relatives or my friends are also use MP.
	SI2. People important to me think I should use MP.
	SI3. The recommendation of MP by my friends will affect my decision.
	SI4. Using MP I can communicate with some specific group better.
	SI5. I can't keep in tune with others if they use MP while I don't.
	SI6. I am expected or needed to use MP in my study/work.
Facilitating Condition (FC)	FC1. I think it's easy to buy a cellular for MP.
	FC2. I think the MP system is accessible if necessary, for me.
	FC3. I think it's easy for me to find knowledge of MP.
	FC4. It's easy for me to use MP though I have never experience it before.
	FC5. I could get assistance from my friend if I found it hard to use MP.
Behavioral Intention (BI)	BI1. I am willing to learn how to use MP.
	BI2. I will try to use MP if necessary.
	BI3. I intend to use MP often.
	BI4. I am willing to recommend MP to my friends.
Actual Use (B)	B1. I often use cellular mobile payments.
	B2. I have ever recommended MP service to others.

Source: Peng et al (2011)

#### 4. DATA ANALYSIS

In this research, the data collection method used is questionnaires containing closed questions. There are various types of respondents chosen for this research, ranging from students, office workers, entrepreneurs, housewives who are domiciled in Jakarta. Because all respondents own and use cellphones, particularly smartphones. The researcher distributed an electronic questionnaire through Google Form and this research survey will be conduct from September 2018 until

January 2019 through online media such as LINE and Whatsapp and periodically sends invitation to prospective respondents online to fill out the questionnaire. The online questionnaire distributed to 220 respondents consisting of men (102 respondents) and women (118 respondents), of which 62.2% were aged 17-25 years, with their recent education (in average) of undergraduate level studies and a total of 40.9 % lives in the West Jakarta area. The questionnaire distributed to respondents consisted of two parts. The first part is the demographic of the respondent and the second part is the question and

choice of answers in the form of Likert scale, which is a method for measuring attitudes, perceptions, and opinions on certain subjects, objects or events. Hypothesis testing conducted in this research by using research and analysis methods that are formed in accordance with the variables studied in order to produce accurate results. In addition, SEM is able to test complex studies and many variables simultaneously. SEM may complete the analysis with one estimation where the others are solved by several regression equations. SEM is grouped into two approaches. This research used PLS method with smartPLS 3.0 software. PLS used is a random bootstrapping method. Therefore, the assumption of normality will not be a problem for PLS. Besides being related to data normality, bootstrapping by PLS does not require a minimum number of samples. PLS is classified as a non-parametric type, which in the modeling does not require data with normal distribution. The purpose of using PLS is prediction, where the prediction in question is the prediction of the relationship between constructs. In terms of constructs, PLS can accommodate both formatively and effectively.

## 5. RESULTS

Firstly, we conducted a pre-test to 30 respondents regarding the statements relating to the use of mobile payments in their daily life. By conducting this pre-test, we wanted to see what indicators are invalid statements.

From the results of the pre-test, it was found that the user-friendly display of mobile payment is a highly influential factor in the use of mobile payments and the statement of "I fear of the error on functioning the MP", "I fear for the exposure of privacy when using MP", "My relatives or my friends also use MP", "The recommendation of using MP by my friends affects my decision", "I cannot adjust myself with other people if they use MP while I don't", "I am expected (or need) to use MP for study or work purposes", "It's easy for me to use MP though I have never experienced it before", and "I could easily get an assistance from my friend if I found it hard to use MP" should be removed and declared invalid if the value of the loading factor is smaller than 0.7. The final test of convergent validity is to compare the Average Variance Extracted (AVE) value with 0.5 to be declared valid [8]. The results of the pre-test also indicated that social influence cannot affect people in using mobile payments. Following the pre-test and the elimination on several indicators, the statements previously were amounted to 35 statements but only 27 statements are considered as valid. The researcher then runs the data to see the outer and inner models. For the outer model itself, the results of the loading factors obtained, the most influential matter in using mobile payment is that the cost of accessing MP is considered expensive. The result from loading factors, average variance extracted value and composite reliability can be seen in Table 2.

Table 1. Outer Model

Variable	Indicator	Loading Factor	Composite Reliability	AVE
Perceived Risk	R3	0.778	0.822	0.698
	R4	0.889		
Cost	C2	0.875	0.942	0.802
	C3	0.922		
	C4	0.902		
	C5	0.882		
	PE1	0.741		
Performance Expectancy	PE2	0.817	0.881	0.598
	PE3	0.804		
	PE4	0.792		
	PE5	0.707		
	EE1	0.872		
Effort Expectancy	EE2	0.905	0.931	0.772
	EE3	0.877		
	EE4	0.860		
	SI2	0.908		
Social Influence	SI4	0.844	0.869	0.796
	FC1	0.738		
Facilitating Conditions	FC2	0.880	0.865	0.682
	FC3	0.853		
	BI1	0.826		
Behavioral Intention	BI2	0.855	0.903	0.699
	BI3	0.825		
	BI4	0.839		
	B1	0.903		
Actual Use	B2	0.915	0.905	0.826

Source: Result of Data Processing (2019)

The next step is to test the inner model. In testing the inner model, the steps used are using the bootstrapping method or conducting the resampling up to 1000 times[8]. The statements mentioned above are again processed by

using SmartPLS 3.0 software and the results of processing with the bootstrapping can be seen in Figure 2 below.

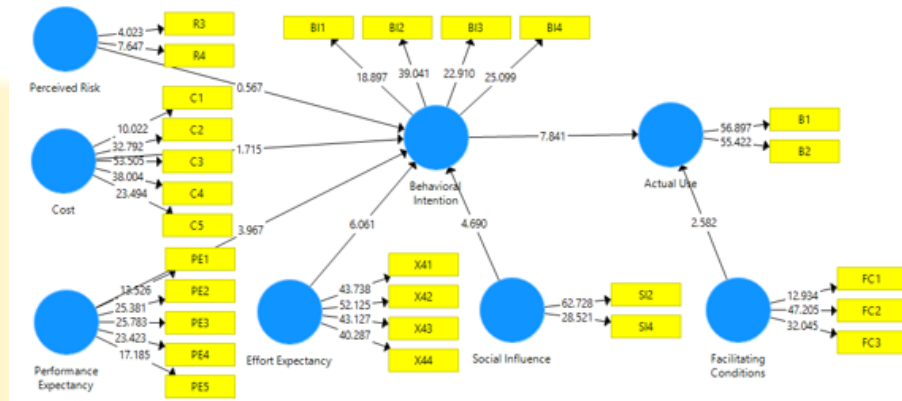


Figure 2. Path Model of PLS-SEM  
Source: Result of Data Processing (2019)

In determining the level of effect in a variable, the value of T-statistics is compared with the value of T-value. This research used a significance level of 0.5% therefore the value of this T-value is 1.96[8]. The T-value is 1.96 for the error rate of 5% and 1.65 for the error rate of 10% and 2.58 for the error rate of 1%. Therefore, if the resulting T-

statistic value is not greater than the T-value, it can be concluded that there is no effect between these variables[8]. The result of the T-statistics value can be seen in the path coefficient section. The results of T-statistics are also in line with the p-value produced at the processing output.

Table 2. Result

	Original Sample	T-Statistics (IO/STDEVI)	P Values	Sig
Perceived Risk -> Behavioral Intention	-0.029	0.573	0.567	Not Sig
Cost -> Behavioral Intention	-0.086	1.599	0.110	Not Sig
Performance Expectancy -> Behavioral Intention	0.218	4.017	0.000	Sig
Effort Expectancy -> Behavioral Intention	0.359	6.013	0.000	Sig
Social Influence -> Behavioral Intention	0.279	4.791	0.000	Sig
Facilitating Conditions -> Actual Use	0.177	2.675	0.000	Sig
Behavioral Intention -> Actual Use	0.541	8.213	0.000	Sig

Source: Result Data of Processing (201

## 6. DISCUSSION

The result in table 3 indicated that consumer acceptance towards the use of mobile payment is driven by performance expectancy, facilitation conditions, and social influences on the behavioral intention which is positively related to the actual use. And perceived risks and costs prove to be an obstacle to one's intention in using mobile payments. The risk can be phishing; actions that require users to disclose confidential information by sending counterfeited important messages that can be e-

mail or other electronic communications and malware; burglary techniques by using malicious software to do things according to the wishes of the maker. This research indicated an explanation and understanding in accepting mobile payments in daily activities where perceived risks and costs may affect a person for not using mobile payment as their primary payment in shopping. In this research, it can be seen that social influence plays a noteworthy role in the use of mobile payments. In the context of marketing, word of mouth communication



(WOM) is considered as providing recommendations both individually and in groups to a product or service that aims to provide information personally. The existence of WOM in surrounding environment can be used as a recommendation for using mobile payments. In addition, using Brand Ambassadors and programs for a brand is considered to influence other people to use mobile payment.

## 7. CONCLUSION

To summarize, this research was conducted to study of user behavior towards the implementation of information technology by using a framework model which adopted by using the UTAUT (Unified Theory of Acceptance and Use of Technology) model. Questionnaires were distributed through online channel for the data collection to 220 respondents in DKI Jakarta area. For the data processing is conducted by using SmartPLS 3.0 software. This research verified that perceived risk and cost factors are the main disruptions that cause the low adoption rate on the usage of mobile payment in Indonesia, and that social influence has proven to be a highly crucial, driving factor for users in using mobile payment.

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