EXPLORING THE INTENTION AND RESISTANCE OF THE CUSTOMER IN ADOPTING THE TECHNOLOGY INNOVATION: A QUALITATIVE STUDY ON THE NFC-BASED MOBILE PAYMENT

Diananda Fitri Pitari
Department of Management, Faculty of Economics and Business, Universitas Indonesia
Depok, Indonesia
diananda.fitria@gmail.com

Gita Gayatri
Department of Management, Faculty of Economics and Business, Universitas Indonesia
Depok, Indonesia
gita.gayatri@ui.ac.id

Asnan Furinto
BINUS Business School, BINUS University, JWC Campus
Jakarta, Indonesia
afurinto@binus.edu

Sofjan Assauri
Department of Management, Faculty of Economics and Business, Universitas Indonesia
Depok, Indonesia
sofjan.assauri@ui.ac.id

ABSTRACT

Manuscript type: *Empirical*

Research Aims: *To explore what do the potential customers of NFC-Based mobile payment perceive to be the key attributes of both the factors- intention and resistance- in determining the adoption of innovation?*

Design/methodology/approach: *Qualitative Study using in-depth Interview*

Research Findings: *Preliminary result suggests existence of three intention, which are: relative advantage, complexity and compatibility; as well as the six resistance factors: value barrier, usage barrier, tradition barrier, risk barrier, image barrier, resistance to change and satisfaction for status quo, - influencing the willingness to adopt the NFC Mobile payment.*

Theoretical Contribution/Originality: *To enrich and confirm the adoption-innovation behavior, where the intention as well as retention on the adoption the new innovation is combined together in order to grab more comprehensive understanding on adoption new innovation. From the adoption resistance perspective, this research explores both active and passive innovation resistance to fully understand their influences on innovation resistance.*

Practitioner/Policy Implication: *The findings in this research might be useful as a preliminary basis for confirming the factors that might boost or hinder the customers' adoption innovation in the context of financial information technology product, especially the NFC-based mobile payment.*

Research limitation/Implications: *As in any qualitative research, the generalization and applicability of this study is limited to the context of the NFC-based mobile payment. Further research might use the findings to test the intention and resistance factors of adoption innovation in the context of financial product. The framework can also be empirically tested with different consequence variables such as customer expectation to adopt new innovation (Venkatesh et al., 2008) using the descriptive research*

Keywords: *adoption of innovation behavior; consumer intention to adopt innovation; consumer resistance to adopt innovation; NFC-based mobile payment; dual factor concept.*

INTRODUCTION

Innovation is an essential strategy in enhancing a company's standing in the marketplace (e.g. Dubickis and Gaile-Sarkane, 2015; Hauser, Tellis, and Griffin, 2006). The right kind of innovation may maintain a company's competitive advantage, and weather the competition (e.g. Dubickis and Gaile-Sarkane, 2015). However, despite investing in meticulous market research, many companies are failing on their product for misreading the customer intention to adopt the innovation (Andrew and Sirkin, 2003; Gourville, 2006). Around 40-55% of the innovations would end up in utter disappointment due to poor response from the market (Castellion and Markham, 2013).

Most previous researches focus on the customer intention to adopt the new technology as a basis for understanding the factors that might determine the customer to be attracted to the new innovation (e.g. Hauser *et al.,* 2006; Rogers, 2003), and the importance of understanding other factors that influence the customer resistance on such situation is still under explored (Cornescu and Adam, 2013; Heidenreich and Kraemer, 2015; Laukkanen, 2016).

Previous research mostly placed the 'intention to adopt innovation and the resistance to adopt the innovation within different construct, while in its basic nature, innovation, when introduced in the market, exposes customers to both intent and resistant behaviors as integral parts within market dynamics (Laumer dan Eckhardt, 2010). Furthermore, with only focused on investigating the customer intention to adopt, the company would only consider the positive aspect of the innovation and neglect the possibility of being rejected by the customer (Cornescu dan Adam, 2013; Laukkanen, 2016). On the other side, when the company focused only on the factors that might lead to the customer retention, they would have tendencies to overlook the negative aspect of the innovation (Cronin, Brady, dan Hult, 2000; Chemingui dan Ben lallouna, 2013). Therefore, we propose that both intention and resistance are equally critical factors that define the success or failure of innovation efforts, and, thus, should not be investigated separately.

An extensive literature review found only two prominent studies that have integrated the intention and resistance in adoption of hospital system information context, either from the point of view of the Doctors (Bhattacherjee and Hikmet, 2007) or the patients (Hsieh 2015; 2016). Apparently, till now there is no consensus on the specific factors that might influence the intention and resistance on the customer adoption innovation in the context of the financial product such as NFC.

The Near Field Communication (NFC) based Mobile Payment is the mobile payment innovation that transforms a cellular phone or smartphone into a wireless and offline digital wallet (Pham and Ho, 2015; Madlmayr, Langer, Kantner, dan Scharinger, 2008). Indonesia with relative less number of the Bank account holder as well as low number of internet connection/reliable internet connection has become the promising potential market for the NFC-based mobile payment (Statista, 2016). However, statistically, the number of NFC-based mobile payment up till present is still lower than expected (Telkomsel, 2019).

From the previous research, some key factors influencing the intention and resistance of adoption of an innovation in the context of NFC-Based mobile payment had been mentioned. However, as suggested by Ting (2016) and Deng (2015); it is important to investigate further and validate the factors that influence the Indonesian potential customers using qualitative research guided by the following research question:

"What do the potential customers of NFC-Based mobile payment perceive to be the key attributes of both the factors- intention and resistance- in determining the adoption of innovation?"

LITERATURE REVIEW

Innovation Adoption Process

Innovation is described as the idea, practice, or object that is perceived as a new thing by the user or other potential adopters (Rogers, 1995). However, the innovation adoption process is a stage where the customer firstly becomes aware of and then have a proper knowledge about the innovation; the stage is eventually followed by the (positive/negative) attitude towards the innovation, decision to adopt or reject the innovation and finally post decision confirmation (Rogers, 2003).

Understanding the innovation adoption process, should be viewed from two perspectives, first of which is from the positive point of view. With the assumption that the innovation has a useful

function to fulfill the customer's needs, many researcher's intent to investigate the possible factors that influence the *intention* to adopt the innovation (e.g. Cornescu and Adam, 2013; Laukkanen (2016). On the other hand, in anticipation of the possible barriers that hinder the possibility of customer adoption-innovation; many other researchers focused on exploring possible factors to be avoided if they influence the customer resistance on the innovation (Cronin, Brady, dan Hult, 2000; Chemingui dan Ben lallouna, 2013). Investigate both variables simultaneously will give a comprehensive view and the ability to be able to explain the customer adoption behavior more accurately (Chemingui and Ben lallouna, 2013).

Intention to Adopt the Innovation

Intention is the measurement of customer readiness to perform certain behaviors, and is the antecedent of the actual behavior (Ajzen, 1991). Intention to adopt the innovation as the extent of customer possibility to use or utilize the innovation in the future (Venkatesh, et.al., 2008). One of the literatures covering the intention to adopt the innovation from Lu, Yang, Chau and Cao (2011) empirically found that there are three characteristics of innovation that consistently influence the intention to adopt, namely: relative advantage, compatibility and complexity.

Resistance to Adopt the Innovation

Resistance to adopt the innovation is defined as negative reactions of the customers toward an innovation on the assumption that the innovation may change their *current status quo e.g.* satisfaction with current product; or the innovation may go against their *structural belief* (Ram and Sheth, 1989; Heidenreich and Kraemer, 2015). There are two types of resistance: a passive and an active innovation resistance (Heidenreich and Handrich, 2014). *Passive innovation resistance* refers to the customer tendency to reject the innovation even prior to evaluate the innovation (Talke and Heidenreich, 2014) since they are trying to maintain the *status quo* (Zaltman and Wallendorf, 1983). Meanwhile, A*ctive innovation resistance* refers to customers' negative attitude formed by their evaluation towards an innovation's functional and psychological barrier (Heidenreich and Handrich, 2014).

Framework to Integrate the Intention and Resistance to Adopt the Innovation

Adoption innovation can be explained using the theory of behavioral change (Ginzberg, 1979); Zmud and Cox, 1979). In other word, any promoted innovation is perceived as a new change in customer life, since it might change their habit and routine (Cornescu and Adam, 2013). Lewin (1947) explains this combination through 'change theory'; a person's behavioral change is influenced by one's intention to change or resistance that prevent's the change. This concept is similar with the *dual factors* theory by Cenfetelli (2004) that supports that both intention and resistance should be combined in order to comprehensively understand the customer adoption innovation. This research will explore the attributes of intention based on the revised financial product framework of adoption innovation (Lu *et al.,* 2011; Rogers, 2003; Zhang *et al.,* 2012), and attributes of resistance based on the Heidenreich and Handrich (2014) two factors of resistance framework.

The Research Context: Near Field Communication (NFC)-Based mobile payment

NFC Mobile Payment is the proximity mobile payment that transforms a cellular phone or smartphone into a wireless and offline digital wallet (Madlmayr, Langer, Kantner, and Scharinger, 2008; Pham and Ho, 2015). The payment method is relatively convenient since the customer does not need any internet connection during the transaction and does not need to have any bank account like that of the mobile banking payment method (Untoro, Aria and Dewi, 2013).

NFC enables two information technology devices to communicate without cable (wireless) and without internet connection (Luo, Yang and Huang, 2016), i.e. tapping/touching your smartphone and the *point of sales (POS)* system (Leong, Hew, Tan, Garry, and Ooi, 2013; Volpentesta, 2015). The ability of the NFC system to communicate only between two close distance devices makes the system relatively more secured compared to the other mode of relatively longer-distance mobile payment (Leavitt, 2012).

RESEARCH METHODOLOGY

The confirmatory study based on a qualitative analysis of in-depth interview face-to-face (Bristol and Fern, 2003) involving the potential customers of NFC-based mobile payment who are aware about the NFC product and/or watch the advertisement about NFC-based mobile payment. The participants criteria are: age minimum

17 years, minimum junior high school graduate, has a minimum monthly average expenditure of IDR500.000 (around US$35) for student, and IDR 1.500.000 (USD100) for employed. An interview guide was prepared as a list of an open-ended question to ensure that the participants could freely express their opinion about the topic under research without being influenced by the researcher's point of view (Spinelli, Dinnellaa, Masia, Zobolib, Prescotta and Monteleone, 2017). An open ended interview guide was prepared in advance to ensure the research reliability (Wahyuni, 2013). Prior to the interview, the participants were requested to watch the self explanatory video regarding the NFC-based mobile payment, comply the *Carliner's Threepart Framework of Information Design* (Carliner, 2000)

The in-depth interviews were transcribed verbatim. The scripts were coded in order to see the group of patterns that can be related to the phenomenon (Strauss and Corbin, 1990) of inten-

Table 1. In-depth Interview Guide

	Question list	Code	Interview Result
Intention to adopt	*Relative Advantage* What do you think about the benefit of using NFC-based mobile payment compared to the previous payment method? Would the benefit influence you to use/adopt the product?	RA	*Confirmed*
	Complexity What difficulties do you think you might face when using the NFC-based mobile payment? Would that difficulties make you hesitant to use/adopt the product?	COX	*Confirmed*
	Compatibility Do you think NFC-based mobile payment is in line with your current need? If yes, will you use/adopt the product?	COB	*Confirmed*

	Question list	Code	Interview Result
Active Resistance	*Usage Barrier* Do you think the NFC-*based* mobile payment fit your usage habit? In what sense? Will it make you adopt it?	UB	*Confirmed*
		VB	*Confirmed*
	Value Barrier Do you think the NFC-*based* mobile payment has better performance and monetary value compared to the existing product (please specify)? If yes, will you use/adopt the product?	RB	*Confirmed*
		TB	*Confirmed*
		IB	*Confirmed*
	Risk Barrier Are you thinking about the possible risk of NFC-*based mobile payment* (please specify)? Will the risk(s) prevent you from using/adopting the product?		
	Traditional Barrier Do you think the NFC-*based* mobile payment will change your financial transaction practice (in which way, please specify)? Will the changes influence you to still use/adopt the product?		
	Image Barrier Please describe your perceived image and feeling about NFC-*based mobile payment* and innovation in technology? Will that (perception) image influence you to still use/adopt the product		

	Question list	Code	Interview Result
Passive Resistance	*Resistance to Change* Why do you think people have a tendency to maintain their current status?	RC	*Confirmed*
		SQS	*Confirmed*
	Status Quo Satisfaction How satisfied you are with current payment innovation (please specify)? Does your current satisfaction influence you not to be eager to try the NFC-based mobile payment?		

tion (Rogers, 2003; Zhang *et al.,* 2012); and resistance (Heidenreich and Handrich, 2014). The process employed a content analysis, and the data was compared deductively with the theoretical framework(Graneheim and Lundman, 2004; Hsieh and Shannon, 2005) The data with the similar coding will be categorized as an emerged theme, and analysis as well as conclusion would be drawn from those themes and translated/presented in English (e.g. Song, Drennan, dan Andrews; 2012).

RESULTS

Six participants were interviewed, and their responses reached the saturation of the theory. The demographic of the participants is available in the appendix. Three main themes were identified that match with the proposed theoretical framework regarding intention and resistance towards adoption innovation. The first theme is Intention to adopt, with three sub themes: Relative Advantage (RA), Complexity (COX) and Compatibility (COB). The second theme is active resistance, with five sub themes:

Usage Barriers (UB), Value Barrier (VB), Risk Barrier (RB), Traditional Barrier (TB), and Image Barrier (IB). And the last theme is Passive Resistance, with two sub themes: Resistance to Change (RC) and Status Quo Satisfaction (SQS).

Intention to Adopt

The first sub-theme connects with the Relative Advantage of the NFC-based mobile payment. All participants confirmed that the NFC-based mobile payment is giving more benefit and relative advantages compared to any other competitor/existing payment method. This positive perception increases their intention to adopt the product

"*for me who always forgot to bring my wallet, it might be very helpful. Moreover, it does not depend on my internet connection, right?*" (Participant 1); "*I think the main benefit is the speed of transaction, all you have to do is only tapping and entering the pin. I feel the urge to try it by myself*" (Participant 2); "*It is easy and simple; I really want to try it* (Participant 3); "*Compared to the existing payment method, it is indeed easier and faster; for sure I am interested* (Participant 4) "*the payment mechanism is faster because no internet needed, I am interested to try*" (Participant 5).

The second sub theme is related to the *Complexity (COX)* of the NFC-based mobile payment. When the participant perceived that the product is something difficult to use, they will have a tendency to avoid it. On the contrary, the participants who perceive the product not complex and rather easy to use, will have the intention to use the product in the future:

"*may be the activation process is the one that turned me down*" (Participant 1); "*why do I need to buy the sticker before I can use the NFC? on top of that, should I remember the activation code?*" (Participant 3); "*I think (the process) it is easy, similar with any payment method using my cellphone. I might use it one day* (Participant 5).

And the last theme is related to the Compatibility (COB) of the NFC-based mobile payment with their current need. The participant perceived a high compatibility of the product and showed high intention to adopt the product;

"They issued the receipt and transaction record, so it can help me to monitor my expenses, suitable for my need. I am even more interested to use the product soon" (Participant 2); "The transparency and easiness of payment make me agree that this is possibly the solution for my needs and many others without internet for making non-cash payment. It will increase our intention (Participant 3); "I need this kind of payment which is practical, fast, and hassle free; it allows me to check the amount I have spent and provides the proof of payment (Participant 4); "This product fits with my need on fast and hassle-free payment" (Participant 5)

Active Resistance

The first sub theme of active resistance is Usage Barriers (UB). The participants reveal that when they perceived that the NFC-based mobile payment need some adjustment in their way of transaction/ habits, they might tend to avoid the product. However, when they perceived that the technology used is similar with the existing mode of payment (e.g. e-wallet), there is bigger possibility that those participants will have the intention to use the product in the future.

"well, I never use it, though. No matter what, there must be some adjustment needed in order to use it, no matter how small the effort is. It might turn me down a bit" (Participant 2); "most of the payment method is non-cash. Even credit or debit card now are rarely used. It becomes addiction already to pay using the mobile phone. So far I have no objection as long as they offer more promotional gimmick" (Participant 3)

The second sub-theme is Value Barrier (VB). When the participants assume that the NFC-based mobile payment have an advantage and monetary value compared to the existing mode of payment, they might adopt the product without hesitation:

"The fact that it needs no internet fulfils both criteria; performance value and monetary value, since we do not need to buy an internet credit to use the NFC. I am interested to try it one day" (Participant 3); "Of course, for me the fast transaction means time efficiency. It is beyond any monetary value (Participant 4); "Money wise, it is fast. Performance wise, it is better compared to CC or DC; this fact might increase the possibility of me using it later (Participant 6).

The third sub-theme is Risk Barrier (RB). Participants mentioned some potential risks involved when using the NFC-based mobile payment. These risks might hinder the opportunity to have the intention to use the NFC-based mobile payment in the future

"I am afraid if someone can steal my money, I do not want it to happen" (Participant 1); "How about my personal information? They can use my data (sell my data) for interruption or even worse, for fraudulent activity? Of course, it lessens the attraction of the product." (Participant 2).

The fourth sub-theme is Traditional Barrier (TB). When the participant perceived that if their normal routine is not affected by using the NFC-based mobile payment, they might want to try the product in the future, but when it influences some changes on their normal activity, they might consider not to adopt the product.

"Since we are all familiar with the mobile payment, I do not think any changes or adjustments on routine activity needed. So it wont change anything" (Participant 3); "But only if they have the machine in the same place where I do the transaction with other e-wallet brands, I might consider to use it" (Participant 5); "there are at least two things related to NFC that will change my routine: first, transforming from using cash or card to mobile payment, and second, from online shopping to brick and mortar shopping (if I want to use in store). The extra effort needed actually discourage me" (Participant 2)

The last sub-theme of the Active Resistance is Image Barrier (IB). The perceived negative image might also negatively influence their intention to adopt the NFC-based mobile payment:

"NFC is commonly attached to the communication company, and not banking services. Are they reliable? I have not heard any positive image about communication company that offers the financial product. So maybe let us wait and see first." (Participant 1); "Just like other electronic payment, I have a negative sentiment against it. The possibility for personal data breaching makes me avoid that kind of products" (Participant 2).

Passive Resistance

The first sub theme transpired is Resistance to

Change (RC). Most of the participants of the in-depth interview have a tendency to adopt the new innovation and a low tendency towards passive resistance since they believe that if they are not following the trends or updates, they will be left behind; but there are few participants that are more conservative when reacting to the new innovation too.

"I have a tendency to adopt the new technology, I do not want my friends think that I am outdated and yes, it makes me want to try this NFC product" (Participant 2, Participant 3, Participant 6)

"Even though I am not an initiator or early adopter of new innovation, if I can self-assess, I am quite updated with the recent trends; especially if a lot of people are on it (adopt it) like this mobile payment (Participant 5); "I think I am among the few who are not willing to adopt the new innovation as soon as it is being introduced; that is why I might not rush to adopt this NFC" (Participant 1); "I do not go along easily with any new technology, I lack those-thingy, I think I won't adopt it now" (Participant 4)

The second sub-theme of the passive innovation is Status Quo Satisfaction (SQS), where the participants stated that they are satisfied enough with their current method of payment, and has less to no intention (feeling resistance) to adopt the new innovation; interestingly, for the participant who has a negative experience with the current mode of payment, the NFC method attracts them to go for a trial in the future:

"So far I had no bad experience with the card or off-line payment (with cash). Then it makes me think: do I really need the new payment innovation like this?" (Participant 1); "It is true that normally if one is satisfied with your current payment, one is not going to switch to the other product. But I once miserably failed completing a transaction in Purwokerto due to bad internet connection; thus, it might be a good idea to try NFC which does not need any internet connection (Participant 6)

DISCUSSION

The three themes, namely: Intention to Adopt, Active Innovation Resistance and Passive Innovation Resistance; along with their ten sub-themes (RA, COX, COB; UB, VB, RB, TB, IB; RC and SQS) served substantively to cover the relevant factors and attributes underpinning the customer intention and resistances as expressed by the participants in this research. It shows that the framework proposed is suitable for the evaluation of the adoption innovation in the context of voluntary technology adoption-innovation.

In the context of the intention to adopt new innovation technology, the result of this study confirmed the research by Pham and Ho, (2015) saying that there are three factors influencing the intention to adopt the innovation: relative advantage (if they perceived that the advantage of using the new innovation outperform the current product used), compatibility (when they perceived the process and system in the new innovation is compatible with their need), and complexity (when they perceived that the new innovation is easy to use); under this scenario their tendency to adopt the innovation is increased.

From the relative advantage side, the NFC-based mobile payment is perceived as: fast, easy, and practical compare to the existing product, hence, trigger their interest to adopt the product. From the complexity side, however, the complex registration process as well as the usage of customer code was perceived as difficult to do, hence decrease the intention of non- user but not for the existing user. If the product could be designed without complicated code and less complex registration required, the customers might prefer it compare to the other method since it is fast and practical.

For the *active innovation resistance for NFC-based mobile payment,* the results are in line with Kuisma *et. al.,* (2007) in the context of internet banking, denoting that there are five barriers that might deter the customer to adopt the new innovation: *value barrier, usage barrier, tradition barrier, risk barrier,* and *image barrier;* and these barriers may encourage them not adopting the innovation. Since NFC is within the similar product category with the internet banking, these five barriers might be concluded as the barriers that might be relevant and should be addressed in the financial product context.

Finally, we support the argument from Talke and Heideinreich (2013) and Heidenreich and Spieth (2013) that when customer have a *passive innovation resistance* due to their cur-

rent situation or status quo satisfaction, they might lessen their willingnes and feel reluctant to adopt the newly introduced innovation although they might be aware that the innovation might bring better benefit for them. Moreover, when there exists a status quo or the current product adequately satisfies their needs, they feel no extra urge to adopt the new innovation once introduced.

The findings in this research might be useful as a preliminary basis for confirming the factors that might boost or hinder the customers' adoption innovation in the context of financial information technology product, especially the NFC-based mobile payment. However, as in any qualitative research, the generalization and applicability of this study is limited to the context of the NFC-based mobile payment. Further research might use the findings to test the intention and resistance factors of adoption innovation in the context of financial product. The framework can also be empirically tested with different consequence variables such as customer expectation to adopt new innovation (Venkatesh *et al.,* 2008) using the descriptive research.

CONCLUSION

This research provides an insight that combines both intention and resistance factors within the same framework for a better understanding of a customer's adoption-innovation behavior. This research so far is the first attempt to validate the framework within the voluntary context, where customer has full right to decide whether they would adopt or not the NFC-based mobile payment innovation. Therefore, putting efforts in investigating the factors that might reassure the intention to adopt or inhibit resistance to adopt might be beneficial for the IT companies that plan to launch their innovation. Such efforts will ensure the suitable marketing strategy by increasing the compatibility, relative advantage and also by minimizing the complexity of the innovation technology underpinning the intention factor. On the other hands the marketing strategy will also have to address issues related with tackling the negative effects of the active customer resistance as manifested in fiver barriers. It will also have to devise a strategy to break through the passive customer resistance by alluring them to come out of their comfort zone/status que.

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Appendix A

Demographic Data of the Participants

#	Name	Age (yo)	Gender	Method of Payment Used
1	Karisha	24	F	Debit Card, e-money
2	Laksmita	32	F	Debit Card, E-money, E-wallet
3	Wahyu	33	M	Debit Card, E-money, E-wallet
4	Bachtiar	48	M	Debit Card, E-Money
5	Lucky	28	M	Credit Card, Debit Card, Cash, E-Money, E-Wallet
6	Widi	22	F	Credit Card, Debit Card, E-wallet