Consumer Behavior Toward Adoption of Mobile Payment: A Case Study in Indonesia During the COVID-19 Pandemic[*]

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Abstract

The purpose of the research was to investigate the characteristics of technology users, their knowledge about the technology and whether that affected technology adoption, and, through the measurement utilitarian value as a mediator, to find out whether the behavior toward mobile payment technology adoption is considered most effective during the COVID-19 pandemic, especially at this research locus, Central Java Province, Indonesian Batik SME consumers. The research methodology was quantitative with data processing using Structural Equation Modeling (SEM) with the final sample of 294 respondents' answers. To the best of the researcher's knowledge, this was an initial attempt toward a holistic and integrative approach to explain the adoption of mobile payment in Indonesia with different consumer characteristics in each region of Indonesia and varying levels of knowledge about mobile payment applications. The results show that the utilitarian value as a mediating variable only affected the relationship between the characteristics of technology users and adoption behavior. The findings of this study suggest that the stronger the knowledge of technology users, the more influential the adoption behavior of the mobile payment technology for Indonesian Batik small-, and medium-sized enterprise (SME) consumers during the COVID-19 pandemic in the new normal era.

Keywords: Technology Acceptance, Users Knowledge, Utilitarian Value, Consumer Behavior, Batik Consumers

JEL Classification Code: O33, M31, M38

1. Introduction

Society currently had a high level of awareness of the spread of the COVID-19 virus (Chan et al., 2020). Initially, some Indonesians tended to use cash more often in transactions than cashless payments (Azali, 2016), but since the COVID-19 pandemic the government had advised to make transactions using cashless, which was one of the right steps during the COVID-19 pandemic. These efforts were

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embraced by MSME actors as they were entering the new normal era, especially in the transaction process.

As a type of electronic payment system, mobile payment had started to gain popularity in recent years due to the increasing advances of mobile devices in the current era. Mobile payments and technological advances in tokenization and near-field communication (NFC) (Lee, Harindranath, Oh, & Kim, 2015) could lead to fewer mistaken transactions and a reduced risk of data breaches (Lowry, 2016). Interest in m-payment was growing among consumers and traders because m-payment was a modern alternative to debit and credit cards (Liébana-Cabanillas et al., 2018), as seen in the Indonesian Batik small-, and medium-sized enterprise (SME) sector, which was experiencing a shift in modern transaction methods, especially since the coronavirus outbreak spread in Indonesia. Mobile devices are used for m-payment, such as a smartphone, to transfer money to complete transactions (Zhou, 2014). NFC technology enabled mobile devices to act as virtual consumer credit cards (Al-Fayoumi & Nashwan, 2018) in a non-contact way.

Financial institutions in Indonesia had presented mobile banking services as a breakthrough to facilitate long distance banking services. Even though it offered convenience and

benefits for consumers, the adoption of mobile-based payment methods, including e-wallets, was not growing as fast as in developed countries (Kongaut & Lis, 2017) because many regular customers were not provided certainty in their use, in other words, they were still doubtful about the safety. The existence of expressions of low levels of trust was the main reason for not adopting online payments offered by financial institutions (Gao & Waechter, 2017). It is in line with empirical findings about mobile payments and about the importance of resistance to payment models via mobile applications (Hoek, 2017) in the present and in the future.

The process of operating transactions using mobile payments required knowledge about the use of technology. In line with the research of Lin et al. (2020), the results suggested that basic knowledge was needed to achieve low-level curriculum goals (i.e., mastery of basic information and knowledge skills) and high-level curriculum goals (the production of valuable, diverse, and original digital works). In other words, knowledge is needed to achieve the goals, in this case sufficient technological knowledge is needed to be able to adopt m-payments for transactions.

The developing communication technology plays a very important role in supporting the payment system. Profit value, social norms, and social self-image play an important role in the intention to use mobile payment services. Mobile payment methods used wireless networks (such as 4G) and high-performance mobile operating systems (such as iOS) to effectuate financial transactions (Acker & Murthy, 2018); customers could choose to voluntarily interact with companies anytime, anywhere, through the support and the power of digital channels.

In particular, Reinartz et al. (2019) identified these sources of value creation at these higher levels and then usually cultivate a combination of perceived benefits at the level of comfort, relevance, experience, empowerment, and monetary and ecological savings perceived level, which were felt by consumers of Batik SMEs.

The role of mediation is needed in situations of using information technology and information systems to help consolidate further theoretical expansion, in line with the results of research by Odoom and Kosiba (2020), which used the theory of acceptance and use of technology (UTAUT) or the theory of acceptance and unity of use of technology to test consumer behavior on the adoption of mobile payments in Indonesia in developing economies.

Looking at the results from Wang (2019) in his research conducted in Taiwan, a developed country in Asia, the findings show that the utilitarian value did not affect the adoption of mobile payment technology. This was the main gap in this research, because it was conducted in a developing country, Indonesia, especially analyzing Batik SME consumers spread across Central Java Province. Given the current conditions about the demand for safety,

consumers are starting to realize the importance of changing the method of cash transactions with m-payments during the COVID-19 pandemic in the new normal condition.

Based on this explanation, the use of mobile payment services in the new normal era needed to be deeply examined as regards the intensity of its use and its effect on technology adoption behavior and knowledge of technology through the value of mobile payment usage for Indonesian Batik SME consumers.

2. Literature Review

Mobile payment (m-payment) is an important component of m-commerce. Mobile payment is defined as "the exchange of financial value between two parties using a mobile device." There are a variety of mobile payment options, such as mobile applications for online shopping, mobile payments at point of sale, and special mobile payment methods such as e-wallets (Clement, 2019). The definition can be summarized as follows: m-payment is a process in which at least one stage of a transaction is done using a mobile device (such as a cellphone, smartphone, PDA, or any wireless capable device) capable of processing financial transactions securely over a cellular network, or through various wireless technologies (Bluetooth, radio frequency identification (RFID), near field communication (NFC), etc.).

An analysis of the literature suggested that many studies often focus on a single specific aspect of mobile payment (Ondrus & Pigneur, 2006). A large amount of literature had focused on technology issues and new security identification of payment schemes because mobile payment solutions have to face greater security and privacy challenges than in e-commerce and e-payment.

The available literature discussed mobile commerce and mobile payment systems. However, there was an uneven degree of diffusion of the development of mobile payments across contexts (Suárez, 2016). Moreover, in a review of research on mobile payment systems, Dahlberg et al. (2015) cautioned that blending developed with emerging markets could cause confusion about the progress of mobile payments research. Prior to introducing the latest knowledge about mobile payments, the system tended to be leaning toward proof of the means of exchange (cash), so the results had a negative effect on the continued use of mobile payments.

Meanwhile, to fill this research gap, the authors referred to research conducted by Sand et al. (2020), which investigated the use of the four categories of sharing platforms (mobility, retail, tourism, and finance), where the research was limited to consumers in the United States. In fact, in the global economy, there may be differences across geographic and cultural locations. This research was completed before the COVID-19 pandemic, which might have significant implications for how consumers perceived

various developments that had led to suggestions that future research should consider consumers' perceptions and desires to share change during the COVID-19 pandemic.

Moreover, our research locus was on Batik SME consumers in the Central Java Province, Indonesia. The people of Central Java have very unique characteristics. Kurniasih (2018) stated that most consumers who bought Batik in Central Java tended to buy Batik in Batik shops/boutiques/showrooms, so this was what was ultimately detected if Batik consumers in Central Java would tend to make transactions with cash or using a debit or credit card instead of transacting using a mobile payment application.

Based on the gap we described above, we would like to explore the current magnitude of m-payment usage, which was recommended by the government because, in addition to having positive sides, including ease or practicality, it was also considered to be safe in the context of the COVID-19 pandemic. Although some people had limited knowledge about m-payment, especially in small cities, at least this transaction medium was very popular before the COVID-19 pandemic, which was currently a big problem for the social and economic sectors in the world.

2.1. Theoretical Framework and Hypotheses

2..1.1. Characteristics of Technology Users

Interest in individual differences had grown in behavioral studies of mobile payment users (Yang et al., 2012). In that study, two constructs of individual differences – personal innovation in new technology and absorption – were considered important in the literature on information systems and cellular services. From the perspective of a cellular company, it seemed that each individual affixes different values to application use, which was expected to have benefits associated with using the application (Kim, Mirusmonov, & Lee, 2010).

Another problem is that one's innate nature, technological features, and social influences, could indirectly shape individual behavior to adopt new technology by influencing the construction of perceived usefulness and perceived ease-of-use that was the usage value of the technology application (Davis 1993; Venkatesh & Davis, 2000). Based on this literature we propose the following hypothesis:

H1: Characteristics of technology users are significantly and positively related to utilitarian value.

The results of other research revealed that the value of using a debit or credit card did not affect the intention to adopt mobile payments; in relation to the ease with which mobile payment was socialized, it produced a negative response affecting the intention to adopt mobile payments or it could be said that the utilitarian value did not affect

the intention to adopt m-payments (Wang, 2019). Hence, we proposed the following hypothesis:

H2: Knowledge of technology users is significantly and positively related to adoption behavior.

2.1.2. Knowledge of Technology Users

Talking about technology, we refer to research on similar matters related to knowledge and intention to use new technology. Voogt and McKenny (2016) explained that the low integration of technology into teaching higher education in Indonesia could be caused by several obstacles. The main obstacle included educators' own knowledge limitation.

The potential of technological knowledge was informed by the prediction method through a directed network (Park & Yoon, 2018). In their research it could represent the direction of the potential of technological knowledge that was predicted by adapting the bibliographic and centrality concepts. Convergent technology opportunities were proposed as technological opportunities by extracting the potential for increased knowledge flow and emerging knowledge flow links. In addition, the direction and themes of potential TKF were predicted to be provided as technological opportunities in the future. Therefore, we proposed the following hypothesis:

H3: Knowledge of technology users is significantly and positively related to utilitarian value.

2.1.3. Utilitarian Value

Utilitarian value is a functional concept in which users would complete multiple target-related tasks with the help of cellular network services (Kim et al., 2007). In addition, utilitarian value was defined as benefits and costs (Lin & Lu, 2015) in the functional evaluation of consumers after they use the product or service as a whole.

The utilitarian value in consumer behavior was usually in contrast to the benefits obtained by using the product or service. However, according to previous research, the utilitarian value view should take into account that there may be perceived monetary sacrifice (e.g., financial effort) and perceptions of non-monetary sacrifice (e.g., time, physical, or mental effort) that determine the 'giving' side of value (Xu et al., 2015; Zeithaml 1988).

Other research results revealed that using a debit or credit card did not affect the intention to adopt m-payments, whereas in relation to the utilitarian value there was a negative response affecting the intention to adopt m-payments or it could be said that costs did not affect the intention to adopt m-payments (Wang, 2019). With the above reviews, we proposed the following hypothesis:

H4: The utilitarian value is significantly and positively related to adoption behavior.

2.1.4. Adoption Behavior

Following the perspective and being consistent with previous research on consumer behavior (Snoj et al., 2004; Sweeney et al., 1999), an innovative view of the value of ICT services could be considered for things captured more broadly about the perception of consumer sacrifice to adopt the service beyond the purely monetary aspects, such as advertising, which is considered to be one of the fastest and most effective methods of communication for brands to build associations and attract their target consumers (Nguyen, 2021).

This study explored the modification of the leading theory, the theory of planned behavior (TPB) (Fishbein & Ajzen, 1975; Ajzen, 1991). This theory used the underlying principles relating to the adoption behavior of information technology to understand the intent of adopting measured from the individual level.

A review of research on mobile payment systems (Dahlberg, Guo, & Ondrus, 2015) warned that blending developed with emerging markets could lead to confusion about the progress of mobile payments research. Prior to introducing the latest knowledge about mobile payments, the system tended to be leaning toward proof of the means of exchange (cash), so the results had a negative effect on the continued use of mobile payments. From this description, we proposed the following hypothesis:

H5: Knowledge of technology users is significantly and positively related to adoption behavior.

3. Research Methods and Materials

3.1. Measurement Instrumental

The methodology used in causal research was a quantitative approach to test the causal relationship between one variable and another; primary data was obtained from respondents, collected by survey method, which aimed to collect information from respondents using a questionnaire containing a list of statements (Sugiyono, 2012).

The research model consisted of four constructs, including: characteristics of technology users, knowledge of technology users, utilitarian value, and adoption behavior. Data collection for this study was primary through a questionnaire survey (El-Kassar & Singh, 2019), which was distributed online using Google Form considering that our research was conducted during the COVID-19 pandemic.

3.2. Descriptive Statistics

Some 350 questionnaires were distributed, but only 309 respondents were returned. There were also some answers that were not relevant to our study so those were excluded. However, after filtering the data, 15 answers were deleted due to incomplete or invalid responses. As a result, 294 respondents' answers were collected in total, with responses to 13 question items; all items were measured using a 7-point Likert scale, from 1 "strongly disagree" to 7 "strongly agree". Experience items were adopted from Leung et al. (2015). The majority of respondents were women (57.8%), and most of the participants had a bachelor's degree (39.1%), with the average age being between 26–34 years old (32.7%), and the majority of respondents were employees (27.6%). (see Table 1).

3.3. Data Analysis

The measurement model began with a confirmatory factor analysis test. The steps taken included the ratio of 2 degrees of freedom (C-min / df), conformity index (GFI), adjusted goodness of fit (AGFI), normalized fit index (NFI), comparative fit index (CFI), and roots squared mean forecast error (RMSEA). Table 2 shows the model fit measured. It was observed that the CFI, GFI and NFI values corresponded to a widely-accepted range of almost 0.9 or more than 0.9, and the RMSEA was less than 0.1, whereas C-min / d.f. is less than 5. Therefore, the observed measurement model matched the collected data.
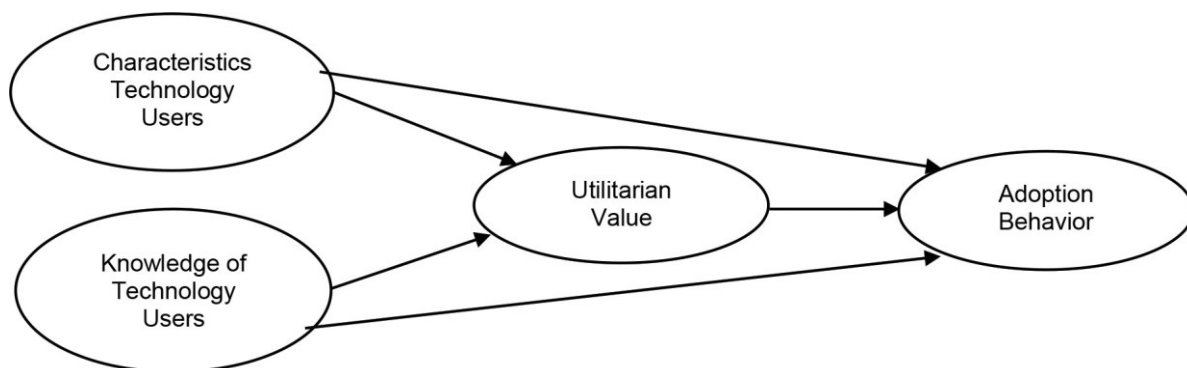

Figure 1: Research Framework

Confirmation factor analysis (CFA) was conducted to test the validity of the measurement model with data. Overall, the results indicated that the measurement model had met the appropriate statistical criteria. Table 3 showed the loading factor values ranging from 0.747 to 1.069. In other words, all factor loading values were above ≥ 0.5,

Table 1: Characteristics of Respondents

Demographics	Categories	Frequency	Percent
Gender	Males	124	42.2
	Females	170	57.8
Total		294	100.0
Education	Doctoral	22	7.5
Background	Master	94	32
	Bachelor Degree	115	39.1
	SMA	21	7.1
		42	14.3
Total		294	100.0
Age	17–25 years	80	27.2
	26–34 years	96	32.7
	35–43 years	51	17.3
	44–52 years	42	14.3
	>53 years	25	8.5
Total		294	100.0
Profession	Governance	49	16.7
	Lecturer	51	17.3
	Teacher	40	13.6
	Entrepreneur	42	14.3
	Employee	81	27.6
	College Student	23	7.8
	Student	8	2.7
Total		294	100.0

then all variables were valid for usage continuity utility or it could be said that all indicators passed the validity test. The result of reliability value was that all (observed) variables were declared valid, with the construct reliability value showed a range between 0.891 to 1.005, it meant all values were above 0.70.

Confirmatory factor analysis was to test the validity, a measure of convergent validity of whether an item could effectively reflect the suitability of the factor, while discriminant validity measured whether two factors differ statistically. Average variance was extracted (AVE) for each variable above 0.5 and the loading factor value was also above 0.5 with a significance at the 5% level, hence, the results were in line with the reliability of the indicator level. and the variance extract showed a range of values between 0.791 to 1.021, so the overall value was above 0.50, therefore, the results were valid. On the composite reliability (CR), as listed in Table 2, most of the cargo was greater than 0.7. Each AVE exceeded 0.5 and CR exceeded 0.7, it means that all components met convergent validity (Gefen, Straub, & Boudreau, 2000). According to Nunally (1978), when all factor loading values showed results greater than 0.7, the reliability was good. (see Table 3).

4. Results and Discussion

The results of calculations on the modeling revealed that the characteristics of technology users had a positive (0.016), but no significant relationship (0.667) with the utilitarian value, while knowledge of technology users had a positive (1.066) and significant relationship (0.000) with the utilitarian value. Furthermore, the findings of the relationship between the characteristics of technology users also had a positive (0.037), but no significant relationship (0.272) with adoption behavior through the utilitarian value variable, and the knowledge of technology users had a positive (0.358) and significant relationship (0.001) with the adoption behavior through the utilitarian value. Meanwhile, the utilitarian value on adoption behavior had a positive (0.713) and significant relationship (0.000) with adoption behavior, as seen in Figure 2.

Table 2: Fit Indices for the Measurement and Structural Models

Fit Indices	Recommended Value	Suggest by Author	Measurement Model
$\chi^2/(df)$	≤ 3	Hayduck (1987)	1.793
Goodness of fit index (GFI)	≥ 0.8	Scott (1994)	0.948
Adjusted for degrees of freedom (AGFI)	≥ 0.8	Scott (1994)	0.916
Normed fit index (NFI)	≥ 0.8	Hair et al. (1998)	0.970
Comparative fit index (CFI)	≥ 0.9	Bagozzi and Yi (1988)	0.986
Root mean square error of approximation (RMSEA)	≥ 0.08	Bagozzi and Yi (1988)	0.052

Table 3: Factor Loading Matrices

Construct and Indicator	Factor Loading	Composite Reliability	AVE
Characteristics of Technology Users (Jeltema, Beckley, & Vahalik, 2015, 2016)			
I prefer technology that is easy to use	0.791	0.891	0.803
I am not worried about new technology because all technology can be easily learned	0.870		
Using mobile payment make me more confident because it is up to date	0.862		
Knowledge of Technology Users (Chiou & Sen, 2012)			
I have sufficient knowledge in using mobile payment technology	0.854	0.977	0.936
I can complete the transaction on time when using mobile payment	0.916		
My knowledge of mobile payment can help others when they have difficulty using it	0.747		
Utilitarian Value (Hsiao et al., 2019)			
I find it more effective to use mobile payment when making transaction	0.755	0.919	0.791
I find it more efficient to use mobile payment in transaction	0.830		
I am confident in my decision to use mobile payment during the covid-19 pandemic until the new normal	0.879		
Mobile payment is very supportive of my activities now and in the future	0.921		
Adoption Behavior (Shang et al., 2017)			
I will happily continue to use mobile payment	1.069	1.005	1.021
I will inform anyone about ease of using mobile payment	0.974		
I would recommend to anyone about the benefit of using mobile payment	0.929		
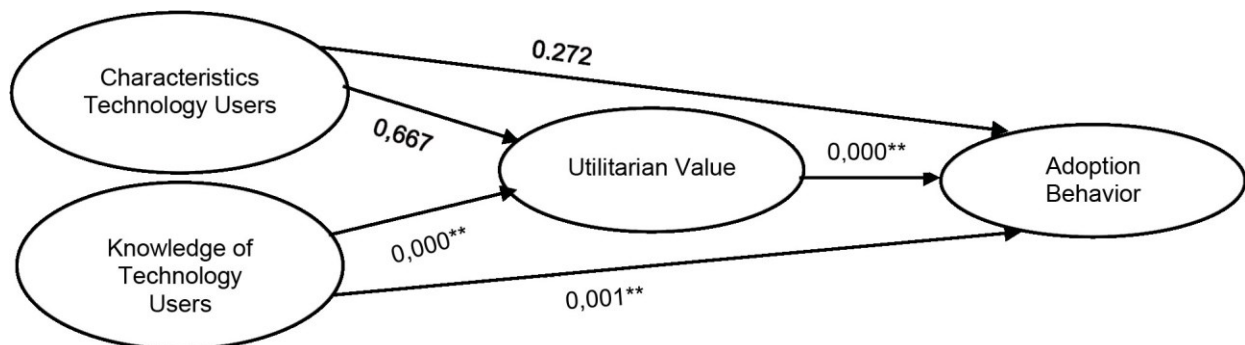
Figure 2: Hypotheses Testing

Note: Significant < 0,05*, 0,001**

We investigated whether the characteristics of technology users and the knowledge that society had about technology greatly influenced adoption behavior through the mediator of the value of using mobile payments during the COVID-19 pandemic for Batik SME consumers in the Central Java region, Indonesia. Research findings reveal that hypothesis 1 was not supported; it turned out that the characteristics of technology users did not have a significant relationship (0.667) with the value of use. It meant that the characteristics of technology users had a positive, but no significant effect on the utilitarian value, where the cost (value) of using mobile payments, even though it was low, would not affect technology users (Batik SME consumers) in their tendency to make transactions using mobile payments. Due to the strong character of consumers who were reluctant to use this technology, it could be said that there was no consumer interest (Yang et al., 2012) to use mobile payment, whereas according to Venkatesh and Davis (2000) it was said that someone who had innate traits formed from social influence could indirectly shaped individual behavior to want to use new technology regardless of the influence of the existing utilitarian value.

Hypothesis 2 was supported; the relationship between knowledge of technology users was positive and significant (0.000) with the utilitarian value. It could be said that the higher the knowledge of technology users or the knowledge of technology by Batik SME consumers, the higher the effect on the use of mobile payments as an application in making Batik product purchase transactions regardless of the utilitarian use (costs) that must be spent to use the technology. Knowledge was a strong factor in choosing whether or not to make transactions using mobile payments.

Hypothesis 3 was not supported; it is found that the characteristics of technology users had a positive and not significant effect (0.272) on adoption behavior through utilitarian values. It is not proven that a person's character influences mobile payment adoption behavior; in certain community characters no results show the willingness or not to accept technological developments to adopt mobile payments. Hypothesis 4 is supported; the knowledge of technology users has a significant relationship (0.000) with adoption behavior through utilitarian values. This means that a person's knowledge affects adoption behavior with the existence of utilitarian values, which are considered reasonable because of it.

Knowledge of technology users is the most important factor in influencing advertising behavior, as evidenced by a good knowledge of technology users; it would also have an impact on technology adoption behavior even though in the process of using the application there were fees charged as utilitarian value, because consumers feel reasonable or very legitimate if something that is more effective and efficient will definitely pay off or there are costs that must be charged

because of the convenience and benefits they get when adopting this technology.

Hypothesis 5 was supported; we also found that the results of the use value on adoption behavior had a positive and significant relationship (0,000); it meant when a cost is a burden, when it comes to the value of using mobile payment applications, consumers were increasingly convinced that the application tended to be safe and would actually want to adopt. Consumers had a logical level of understanding that something valuable should continue to be used or adopted, because it was comparable. Our findings were different from the results of Wang (2019), who showed that with fees charged as the utilitarian value, there was a negative response affecting the intention to adopt m-payment or it could be said that there was a cost burden in its use, which did not affect the intention to adopt mobile payment. This shows that the stronger the characteristics of technology users, the lower the use value of mobile payment technology for Indonesian Batik MSME consumers, especially during the COVID-19 pandemic in the new normal era.

5. Conclusion and Limitations

Mobile payments are generally offered by many service providers. They are competing for a larger market share. Consequently, how consumers behave, both in the pre and post-adoption phases, toward mobile payment services is important to know, such as what will encourage users to use mobile payments and want to adopt them.

The context of this study focused on the locus of a developing country, Indonesia, and only taking respondents from one province in Indonesia that was Central Java. That adoption was done by the community in one of the regions in Indonesia was also interesting for us to study because it was not just consumers, but consumers who bought Indonesian Batik SME products. As it was well known, currently SMEs still need support and attention in order to grow and continue to progress. UKM is currently one of the interesting focuses for the research community, especially those focused on digital marketing or information technology in facing globalization and challenges in the era of society 5.0, especially during the COVID-19 pandemic; it was very important to use mobile payments for transactions (Zhou, 2014), so that it could reduce the risk of coronavirus spreading.

This study also explored leading theories on adoption behavior, including theory of planned behavior (TPB) (Fisbein & Ajzen, 1975; Ajzen, 1991). Clearly, these theories used the principles that underlied all matters relating to the adoption behavior of the form of information technology (IT) to understand the intent and purpose of adopting, which was measured based on the level of individual consumers, in this case the consumers of Batik SMEs in Central Java Province, Indonesia.

Regarding the cost effectiveness imposed on technology (Chiou & Sen, 2012), we discussed it based on the findings of new cases, which indicated that the use of technology might not be as promising as hoped. In addition, there was also an impact from the experience that customers had in considering the use of technology or adopting it.

Our findings consisted of five hypotheses; three hypotheses were supported: the knowledge of technology users on the utilitarian value, knowledge of technology users on adoption behavior through utilitarian values, and the utilitarian value on behavior adoption. Meanwhile, two hypothesis were not supported: the characteristics of technology users on the utilitarian value and the characteristics of technology users on adoption behavior through utilitarian values.

The study provided useful direction by examining the use of mobile payments among Indonesian Batik SME consumers, which so far had not been evaluated well in the Indonesian context. The results of this study can be a reference for Batik SMEs to encourage consumers to continue adopt mobile payments by informing about the advantages and benefits of mobile payments (Voogt & McKenny, 2016), so as to change the perspective of consumers with strong characters who are reluctant to recognize new technology, to change their mindset so that the Indonesian people is increasingly ready to face the era of society 5.0 for the advancement of the nation. Furthermore, with the ability to reduce costs, mobile payment users feel that they have more benefits if they continue to use them. Apart from this, hopefully, more people will be interested in using mobile payments because it is facilitated at a relatively low cost.

In addition, this study provides an important contribution for the government to expand and intensify the dissemination of new technology to the community, so that Indonesians who are technologically literate will be widely available to remote villages. For researchers, our study can be used as a reference for how Indonesians, especially in the Central Java Province, adopt technology, because Indonesians in certain parts of the region would tend to have different characteristics, especially some non-urban areas preferred transactions using cash (Azali, 2016). As for cashless payments that are more popular, such as credit cards, debit cards, ATMs, which are generally well known by the wider community because of important factors, one of which is the reliability factor in accordance with consumer needs (Giao, 2019).

Our research has limitations. First, this study was based on a sample of Batik SME consumers, with demographic characteristics in one province in Indonesia, with the tendency of the people to have strong characteristics of cultural and social influence. Also in the Central Java region there tends to be a lot of people who are using cash as a medium of transactions. Further research can include moderating variables that need to be proposed to reinforce results, such as internal or external factors, customer knowledge assets and technology knowledge assets that can influence knowledge effectiveness (Seo et al., 2018) as a strategy and efficiency in using mobile payments may also be considered in the future.

Second, because the research was done during the COVID-19 pandemic and used a questionnaire that was distributed online, there were many limitations of interaction with respondents. Future researchers could distribute the questionnaire directly to minimize questions that cannot be answered directly by the researcher, so that hopefully it can minimize errors in the results of respondents' answers, which is still less consistent. In addition, future researchers could conduct interviews directly with consumers and Batik SMEs, so that it is expected to get information that can strengthen further research.

Third, we used a random sample without being limited by the sample binding criteria so that the results obtained were not specific to the sample with certain criteria,. Future research can take samples with special criteria so that the results are more focused or can be more specific.

Fourth, this research formulated hypotheses with a focus on testing the relationship at the level of characteristics of technology users and knowledge of technology users on the behavior of mobile payment technology adoption with the utilitarian value as a mediating variable. The findings do not mediate the relationship between technology user characteristics and adoption behavior, so it was necessary to modify the conceptual model presented in this study to include other mediating variables that are felt to affect the relationship between the two.

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