

Factors Affecting the Adoption of Mobile Commerce (A Study on SMEs in Malang)

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Abstract

This study aims at analyzing and explaining factors affecting the adoption of mobile commerce by integrating the variables of Unified Theory of Acceptance and Use of Technology (UTAUT) and Task Technology Fit (TTF). The subjects of the study are owners of SMEs being members of the Chamber of Trade and Industry Malang. The population of the study is 103 owners of SMEs while the sample consists of 97 owners of SMEs. The inferential analysis technique used in this study is Generalized Structured Component Analysis (GSCA). The results of the study show that out of 8 hypotheses, 5 of which are significant and 3 of which are non-significant. The hypotheses resulting in significant effect are performance expectancy, effort expectancy, and fit toward behavioral intention, as well as task characteristic toward fit and behavioral intention toward adoption. The hypotheses with non-significant effect are social influence and facilitating condition toward behavioral intention as well as technology characteristic toward fit.

Keywords: SMEs, Mobile Commerce, UTAUT 1, and TTF

1. Introduction

Welcoming the Asean Economic Community(AEC) and the plan to issue government regulation related to online business have both made a shift in the position of Information and Communication Technology (ICT) from a secondary need into a primary need for business owners and managers. Laudon and Laudon (2006:43) assert“Today, networking and internet are nearly synonymous with doing business. Firm’s relationships with customers, employees, suppliers, and logistic partners are becoming digital relationships.” This is shown through the emergence of various internet-based business which is more user-friendly which can support business transaction such as electronic business (E-Business), a type of electronic-based business service. O’Brien and Marakas (2014) argue that the implementation of E-Business as the use of internet and technology related to it to support and encourage the business process, commerce, and collaboration within the company and with the customers, suppliers, and any parties related to the business. Electronic commerce (E-commerce) makes it possible for companies and customers to interact easily in the process of business. E-commerce is a term used to explain how purchasing, funding, and marketing of a certain product or service can be done using ICT especially the internet as according to O’Brien and Marakas (2014). ICT innovations these days are growing to be more dynamic, expanding toward mobile commerce (M-Commerce). M-Commerce is a right choice in doing business transactions by using mobile-based technology allowing users to do the transactions with no time or place barriers. Kalakota and Robinson (2001) confirm that M-Commerce refers more to business transactions that can be done by moving, where interactions among users can be maintained without the use of internet wire. Hardcastle (2008) asserts that M-Commerce is a development of ICT, in which it takes the form of business activities of marketing goods and services through the use of wireless technology especially mobile phone. Boadi and Shaik (2006) explain that M-Commerce is a service involving many sub-systems; in other words, there are sub-systems and individual components in M-Commerce.

The government supports SMEs in applying ICT especially E-Commerce and M-Commerce by soon issuing regulations related to marketing through internet up to online transactions. SMEs play an important role in the economy of a country, not to exclude in Indonesia, as can be seen from their survival through the monetary crisis during 1997-1998. This has been due to the higher flexibility of the business run by SMEs in facing market changes. The ease of online transactions and business urge SMEs to be able to implement electronic trading especially M-Commerce as to keep their existence in a tighter business competition.

The application of a technology cannot be separated from several approaches of the theory of behavioral information system. In this study, factors related to M-Commerce adoption are measured using the Unified Theory of Acceptance and Use of technology (UTAUT) and Task Technology Fit (TTF). As time goes by and as technologies advance, some innovations on the models of the theory of behavioral information systems emerge which can then be used as an approach for studies related to adoption of technologies—in this sense,

such as the combination of several constructs on UTAUT and TTF Model. M-Commerce adoption is crucial in business world in a way that it can be a strategic tool for SMEs. However, not all SMEs owners apply M-Commerce in doing their business transaction, especially SMEs joining the Chamber of Trade and Industry Malang, East Java. According to interviews with the officials of the Chamber of Trade and Industry Malang, there are some problems hindering the application of M-Commerce, such as the conventional mind-setting believing that technologies belong to large scale business only.

This study employs several main variables of the UTAUT model without adding moderating variables. Chang et al. (2007) explains that “The factors affecting intention to use mobile devices/services by testing the UTAUT. Past research has added new constructs in order to expand the scope of the endogenous theoretical mechanisms outlined in UTAUT”. UTAUT Model considers factors affecting the adoption of technology comprehensively, measuring merely from opinions or perceptions of users, yet is considered not enough to measure how far the information technology can be accepted by users. TTF approach is used to measure the suitability of tasks and technologies applied. The constructs of TTF Model involved in the study including task characteristic, technology characteristic, and fit.

Venkatesh et al. (2003) adapts the Unified Theory of Acceptance and Use of Technology or UTAUT. The model consists of several main variables with direct effect to behavioral intention and use behavior namely performance expectancy, effort expectancy, social influence, facilitating condition. Chang (2012) strengthens that UTAUT Model focuses on the intention of users to use the information system and use behavior. Armida (2008) asserts that UTAUT gives perspective views on variables related to intention and behavior of users from time to time. Yang et al., (2013) explain that TTF Model is suitable to be implemented in a study corresponding technologies and information needs. TTF approach is analyzed to see the performance resulted with the aid of information system. When technologies have complete features and can help finishing tasks, thus they are suitable to implement. Information systems will positively affect performance when they can fulfill tasks needed. Fit or suitability is a factor affecting performance by individuals. Goodhue and Thompson (1995) divide the use of information technology toward performance into three perspectives, namely use, fit, and combination of the two. The TTF constructs employed in this study are task characteristic, technology characteristic, and fit.

2. Research Method

This study is explanatory in nature. Explanatory research is kind of research that explains causal relationship between and among variables through hypothesis testing. The population of the study is 103 SMEs members of the Chamber of Trade and Industry Malang. The sample consists of 97 SMEs. Analyses are done using two techniques, namely descriptive analyses and inferential statistic analyses consisting of linearity testing employing SPSS and Generalized Structured Component Analysis (GSCA) to test the hypotheses. There are 9 (nine) variables in the study namely performance expectancy, effort expectancy, social influence, facilitating condition, task characteristic, technology characteristic, fit, behavioral intention, and adoption.

3. Results and Discussion

Structured Component Analysis (GSCA) was developed by Heungsun Hwang, Hec Montreal, and Yhoshio Takene in 2004. It aims at replacing factors in linear combinations from indicators (manifest variables) in SEM (Solimun, 2012). Before testing the hypotheses using GSCA, a test of linearity using SPSS to determine linear relationship among variables must be conducted. Here are the results:

Table 1. The Results of the Test of Linearity

Relationship between Variables		Test Result	Note
<i>Performance Expectancy (X1)</i>	<i>Behavioral Intention (Y2)</i>	0.000	Linear
<i>Effort Expectancy (X2)</i>	<i>Behavioral Intention (Y2)</i>	0.000	Linear
<i>Social Influence (X3)</i>	<i>Behavioral Intention (Y2)</i>	0.001	Linear
<i>Facilitating Condition (X4)</i>	<i>Adoption (Y3)</i>	0.000	Linear
<i>Task Characteristic (X5)</i>	<i>Fit (Y1)</i>	0.000	Linear
<i>Technology Characteristic (X6)</i>	<i>Fit (Y1)</i>	0.000	Linear
<i>Fit (Y1)</i>	<i>Behavioral Intention (Y2)</i>	0.000	Linear
<i>Behavioral Intention (Y2)</i>	<i>Adoption (Y3)</i>	0.000	Linear

Source: Data processed, 2014

The results of GSCA show that out of 8 hypotheses, 5 of which are significant and 3 of which are non-significant. To examine the suitability of a structural model, the Fit and AFIT value must be used, as follows:

Table 2 Goodness of Fit Model

Model Fit	
FIT	0.537
AFIT	0.526

Source: Data processed, 2014

Fit shows total variances of all variables explained through a certain model. The variance of performance expectancy, effort expectancy, social influence, facilitating condition, task characteristic, technology characteristic, fit, behavioral intention, and adoption can be explained as much as 53.7%, which means that the proposed model is very good as it can describe data variance more than 50%.

AFIT (Adjusted Fit) is almost similar to R squared adjusted done in regression analysis. AFIT at GSCA functions to show the comparison of the model. The model having highest AFIT must be chosen among the good models. Based on Table 1, the AFIT in this current study can be explained as much as 52.6% by the model. This means that the AFIT value of the model formed is good enough.

Table 3. Recapitulation of the Results of Hypotheses Testing

Hypothesis	Relationship between Variables	Estimate	SE	CR	Note
H1	Performance Expectancy → Behavioral Intention	0.231	0.098	2.37*	Significant
H2	Effort Expectancy → Behavioral Intention	0.235	0.070	3.38*	Significant
H3	Social Influence → Behavioral Intention	0.034	0.076	0.45	NonSignificant
H4	Facilitating Condition → Adoption	0.043	0.080	0.54	NonSignificant
H5	Task Characteristic → Fit	0.448	0.200	2.24*	Significant
H6	Technology Characteristic → Fit	0.295	0.175	1.69	NonSignificant
H7	Fit → Behavioral Intention	0.581	0.094	6.18*	Significant
H8	Behavioral Intention → Adoption	0.780	0.093	8.39*	Significant

CR* = significant at .05 level

Source: Data processed, 2014

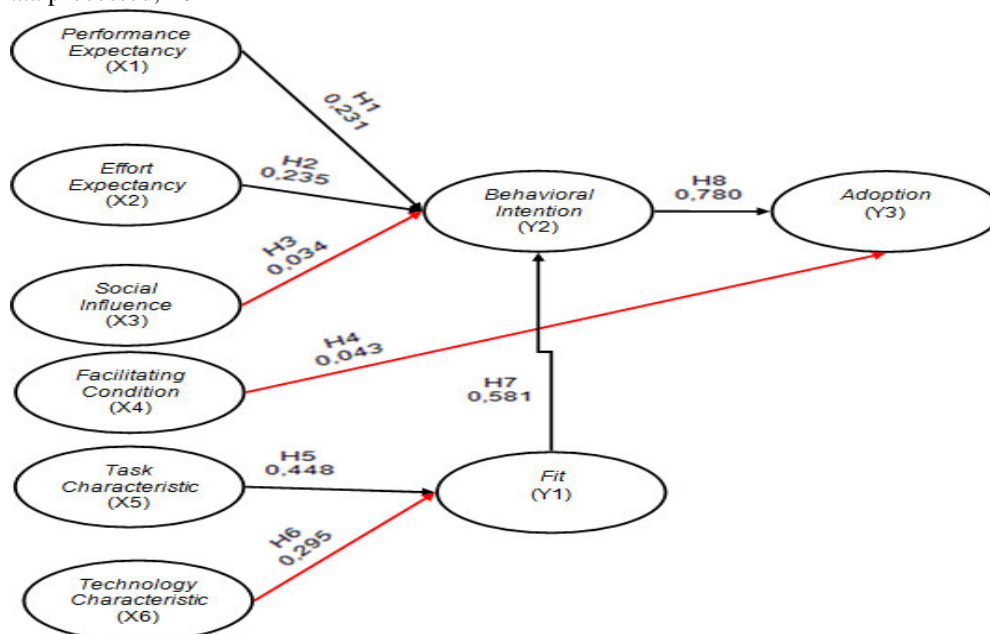


Figure 1 The Results of Hypotheses Testing

The results of hypotheses testing employing GSCA show that performance expectancy significantly affects behavioral intention with an estimate value of 0.231 and critical ratio value of 2.37. The effects of performance expectancy through factors such as helping task, finishing task, improving performance up to productivity toward behavioral intention through statistical measurement results in significant effect. Thus, the results suggest that the higher performance expectancy, then the higher behavioral intention will be in the adoption of M-Commerce among SMEs especially the ones joining the Chamber of Trade and Industry of

Malang. If performance expectancy emerging from SMEs can be well-reflected through factors afore-mentioned, thus it will bring such great effect on intention to adopt M-Commerce. The finding is in line with the ones by Zhou et al. (2010), Deng et al. (2011), Ming Chu (2013), Weerakkody et al.(2013), Wong et al. (2013), and Martin et al.(2014).

The results of hypotheses testing employing GSCA show that effort expectancy significantly affects behavioral intention with an estimate value of 0.235 and critical ratio value of 3.38. The effects of effort expectancy through factors such as ease of learning, implementation, mastery, and operation toward behavioral intention through statistical measurement results in significant effect. Thus, the results suggest that the higher effort expectancy, then the higher behavioral intention will be in the adoption of M-Commerce among SMEs especially the ones joining the Chamber of Trade and Industry of Malang. If effort expectancy emerging from SMEs can be well-reflected through factors afore-mentioned, thus it will bring such great effect on intention to adopt M-Commerce. The finding is in line with the ones by Zhou et al. (2010), Deng et al. (2011), Ming Chu (2013), Weerakkody et al.(2013), Wong et al. (2013), and Martin et al.(2014).

The results of hypotheses testing employing GSCA show that social influence does not significantly affect behavioral intention with an estimate value of 0.034 and critical ratio value of 0.45, which is under the standard value of 1.96. Social influence is reflected through factors such the influence of business partners, competitors, organizational support, as well as social status. Behavioral intention is reflected through factors such as interest, motivation, and choice to adopt as well as increasing intensity of adoption of M-Commerce. Thus, the results suggest that social influence does not affect behavioral intention in the adoption of M-Commerce among SMEs. The finding is in line with the ones by Weerakkody et al.(2013) and Wong et al. (2013). The motivation of SMEs in adopting M-Commerce is not always related with the influence of business partners, competitors, or organizational support. Educational background becomes one of the capitals for SMEs in gaining information related to M-Commerce.

The results of hypotheses testing employing GSCA show that facilitating condition positively but not significantly affect adoption with an estimate value of 0.043 and critical ratio value of 0.54, which is under the standard value of 1.96. Facilitating condition is reflected through factors such as ability, knowledge, compatibility, and reference. Behavioral intention is reflected through factors such as interest, motivation, and choice to adopt as well as increasing intensity of adoption of M-Commerce. Thus, the results suggest that facilitating condition does not affect behavioral intention in the adoption of M-Commerce among SMEs. The finding is in line with the ones by Wong et al. (2013) and Martin et al. (2014). In adopting M-Commerce, SMEs will first consider the financial factor. When the adoption of M-Commerce does not seem to bring profit or financial benefit, even in the presence of complete facilities, then SMEs will be reluctant to adopt it.

The results of hypotheses testing employing GSCA show that task characteristic significantly affects fit with an estimate value of 0.448 and critical ratio value of 2.24. Task characteristic through factors such as flexibility, effectiveness, support to activities, and suitability of M-Commerce adoption toward fit through statistical measurement results in significant effect. Thus, the results suggest that the higher task characteristic, then the higher fit will be in the adoption of M-Commerce among SMEs especially the ones joining the Chamber of Trade and Industry of Malang. If effort expectancy can be well-reflected through factors afore-mentioned, it will bring such great effect on fit to adopt M-Commerce. The finding is in line with the ones by Chang (2010) and Scrier et al. (2010), and Paid and Ming Tu (2011). Considering the situation faced in the field, the majority of the respondents agree that adopting M-Commerce support their business activities. Flexibility and effectiveness are the reasons for the need to adopt M-Commerce.

The results of hypotheses testing employing GSCA show that technology characteristics positively but not significantly affect fit with an estimate value of 0.295 and critical ratio value of 1.69, which is under the standard value of 1.96. Thus, the results suggest that technology characteristic does not affect fit in the adoption of M-Commerce among SMEs. This finding does not confirm the findings by Goodhue and Thompson (1995), Scrier et al. (2010) and Chang (2010), which state that technology characteristic is seen as a construct affecting fit. Based on the empirical data, it has been found out that SMEs choose various internet-based mobile devices. Some prefer laptops, smartphones, Ipad, android under various brands. Talking about M-Commerce, we will be directed toward activities related to online transactions accessed through internet-based mobile devices. Up to these days, there have not been any standard rules related to the layout of M-Commerce. Problems arise when M-Commerce service does not support the mobile devices ones have. When the layout for online transactions does not perfectly appear, then it means that the application misses one of the characteristics for M-Commerce namely personalization. Yen and Lancaster (2008) argue that when M-Commerce is not easy to be personalized, then marketing communication between SMEs and customers may be hindered.

The results of hypotheses testing employing GSCA show that fit significantly affects behavioral intention with an estimate value of 0.581 and critical ratio value of 6.18. Thus, the results suggest that the higher fit, then the higher behavioral intention will be in the adoption of M-Commerce among SMEs especially the ones joining the Chamber of Trade and Industry of Malang. If M-Commerce is thought to be able to help conducting

business activities, thus it will encourage SMEs to adopt it. The finding is in line with the ones by Paid and Ming Tu (2011).

The results of hypotheses testing employing GSCA show that behavioral intention significantly affects adoption with an estimate value of 0.780 and critical ratio value of 8.39. Thus, the results suggest that the higher behavior intention, then the higher adoption of M-Commerce among SMEs especially the ones joining the Chamber of Trade and Industry of Malang will be. High intention will encourage SMEs to adopt M-Commerce. The finding is in line with the ones by Maldonado et al. (2011) related with e-learning adoption in developing countries, in which it has been found out that behavioral intention significantly affects adoption.

4. Conclusion

Performance expectancy significantly affects behavioral intention. Owners of SMEs show high expectation in adopting M-Commerce for helping task, finishing task, improving performance up to productivity. The higher the performance expectancy, the higher the behavioral intention will be. Effort expectancy significantly affects behavioral intention. Owners of SMEs show high expectation in adopting M-Commerce for ease of learning, implementation, mastery, and operation. The higher the effort expectancy, the higher the behavioral intention will be. Social influence does not significantly affect behavioral intention. Owners of SMEs show positive responses related to the influence of business partners, competitors, organizational support, as well as social status; yet, it does not significantly affect behavioral intention.

Facilitating condition does not significantly affect adoption. Owners of SMEs show positive responses related to ability, knowledge, internet-based mobile-technology equipment, and reference from the Chamber of Trade and Industry; yet, this does not make them to directly adopt M-Commerce. Task characteristic significantly affects fit. Owners of SMEs show positive responses related to flexibility, effectiveness, support to activities, and suitability of M-Commerce adoption. Technology characteristic does not significantly affect fit. Owners of SMEs show positive responses related to competitiveness, minimum troubleshooting, user friendliness, and ease of monitoring, yet this does not directly make owners of SMEs to apply it as related to suitability. The position of technology characteristic will not affect the fit of SMEs in adopting M-Commerce. Fit significantly affects behavioral intention. Owners of SMEs show positive responses related to punctuality, feasibility, up-to-date, and consistency of M-Commerce adoption. Behavioral intention significantly affects adoption. Owners of SMEs show positive responses related to interest, motivation, and choice to adopt as well as increasing intensity of adoption of M-Commerce.

5. Limitation of the Study

- a. Remembering that M-Commerce is not yet becoming a compulsory application to be used in business transaction, the study focuses simply on adoption.
- b. The subject of the study are only those owners of SMEs becoming the member of the Chamber of Trade and Industry Malang, making the results of the study cannot be generalized to subjects from different background.
- c. Questionnaires are distributed to groups of SMEs running certain types of business. It has been considered impossible to apply direct interviews to respondents; thus, the researchers provided the respondents with questionnaires to fill in, both with open-ended questions and close-ended question. The limitation of the study then deals with the degree of comprehension of the respondents toward the items in the questionnaires.

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