

Internet Based ICT by Indonesian SMEs (Case Study : Batik Trusmi)

Tita Borshalina¹, Novi Amelia²

¹Widyatama University, tita.borshalina@widyatama.ac.id, Bandung, Indonesia

²School of Business and Management, Institut Teknologi Bandung, novi.amelia@sbm-itb.ac.id, Bandung, Indonesia

Abstract

In order to gain competitive advantages and compete in the global market, SMEs are pushed to adopt the internet based ICT in their business process. Despite of numerous benefit provided by the internet adoption, the internet adoption in developing countries' SMEs are still low. Thus this study is aimed to examine the factors influencing internet based ICT adoption in developing countries' SMEs. This study was conducted in Indonesia with Batik Trusmi, Cirebon, West Java as the case study. Partial least square-structural equation model (PLS-SEM) was used as the analytical tool. The findings showed six factors that significantly influencing the internet based ICT adoption in Batik Trusmi: CEO's knowledge, firm size, competitor, pressure from buyer/supplier, perceived benefit, and cost.

Keywords: ICT adoption; internet adoption; SME; Indonesia; Batik Trusmi; PLS-SEM.

1. Introduction

The development of Information and Communication Technology (ICT), especially the use of internet, has brought changes into business environment. It assists the firms to enhance their customer service, reduce distribution costs, reduce marketing costs and develop marketing activities (Alam *et al.*, 2007). Furthermore, the use of internet in business process creates opportunities for the firm to overcome the size disadvantages (Lester & Tran, 2008), access global market, gaining competitive advantages (Ghobakhloo *et al.*, 2011), enhance the firm performance and create service responsiveness (Eng, 2008a) that lead to customer satisfaction (Eng, 2008b). Thus companies are being pressured to adopt the internet based ICT in order to compete in existing business environment (Zhao, 2010).

The necessity to adopt internet in business process is not only for the large enterprises but also for the small one like Small Medium Enterprises (SMEs). Zhu *et al.* (2003) state that it is pivotal for SMEs to adopt the internet in order to compete in global market. Numerous studies claim that without adopting the Internet, the SMEs would not be survived in the business environment (Thurasamy *et al.*, 2009; Rahayu & Day, 2015). However, despite of various findings about the importance of internet in SMEs business process, the internet adoption among SMEs is still low, especially in developing country (Kontelnikov, 2007; Tan *et al.*, 2009; Ghobakhloo *et al.*, 2010).

As the backbone of the economic development in developing countries, the internet adoption among SMEs still regrettably left behind compared with the SMEs in developed country (Rahayu & Day, 2015). The quality,

availability, and the cost needed to access the infrastructure are mentioned as some barriers for SMEs in developing countries to adopt ICT (Ghobakhloo *et al.*, 2011; Molla & Licker, 2005). The size of the SMEs in developing countries and the lack of training and capable human resource to operate technology, also become the concerns in SMEs technology adoption (Olatakun & Bankole, 2010), not to mention the incomplete government regulation on internet based business (Tan *et al.*, 2009). This situation raises the question as to what are the factors that influence the internet based ICT adoption among SMEs in developing countries. It is important to study since previous researches mostly focusing on SMEs in developed country. (Molla & Licker, 2005; Ghobakhloo *et al.*, 2011; Awa *et al.*, 2014). Thus, to better understand this issue, examining the factors influencing internet based ICT adoption among SMEs in developing countries is necessary.

Indonesia was chosen as the developing country where the research would be conducted. As the fourth largest country in term of population, SMEs make 99% of all businesses in Indonesia and absorbed 96.99% of employment (Department of SMEs Indonesia, 2013) yet shows low rate of internet based ICT adoption on the SMEs business process. (Rahayu & Day, 2015; Kotelnikov, 2007). According to the report by Economist Intelligence Unit (2010) Indonesia was ranked 65th out of 70 countries in its digital economy readiness. Indonesia was left behind other South-East Asia countries such as Singapore in 8th rank, Malaysia in 36th, Thailand in 49th, and Vietnam in 62nd, which might explain the slow adoption of internet based ICT in Indonesian SMEs. Therefore conducting the study about factors influencing internet based ICT adoption in Indonesian SMEs would contribute to the understanding of internet adoption among SMEs in developing countries.

2. Literature Review

Internet Based ICT and SMEs

Koltenikov (2007) state that not every SMEs have to adopt the same level of ICT advancement. According to a report by Deloitte (2015), there are four levels of Internet based ICT adoption in Indonesian SMEs. The first level is Offline Business. On this first level, the firms do not have any access to computer or smartphone, broadband, and do not have website. Then the second level is Basic Online Business. The firms with basic online business level are having the broadband access, computer/smartphone, and steady online presence. The next level is Intermediate Online Business: the firms are integrating the website with social media, keeping the live chat or communication threads on their website. The fourth level is Advanced Online Business. In this last level, the firms are having advanced connectivity, social media integration and e-commerce capabilities.

In this study, we aim for the internet based ICT level in SMEs. Tan *et al* (2009) define internet based ICT as the use of internet in business process by using computers, software, and network. Studies find that the use of internet based ICT in business process among SMEs would beneficial for the SMEs growth. The advantages in adopting the internet based ICT are found in every aspect in business process (Kotelnikov, 2007; Lester & Tran, 2008; Tan *et al.*, 2009; Ghobakhloo *et al.*, 2011; Eng, 2014b; Albakri & Katsioloudes, 2014). We summarize the benefits on adopting internet based ICT into four groups in Table. 1 are financial, procurement, service, and market access.

Table 1. The Advantages of Adopting Internet Based ICT

Group	Detail Advantages
Financial	Reducing operating cost. Reducing transaction cost. Reducing communication and administration cost. Increasing performance sale.
Procurement	Enhancing the speed of delivery due to better communication. Better coordination in the value chain.
Service	Closer relationship with customer. Effective communication with customer. Enhancing customer experience. Increasing customer satisfaction. Easier to fulfill customers requirement. Increasing service responsiveness.
Market access	Bigger opportunity to access larger market. Open access to market information. Easier to internationalize new venture.

Sources: Kotelnikov, 2007; Lester & Tran, 2008; Tan *et al.*, 2009; Ghobakhloo *et al.*, 2011; Eng, 2008b; Albakri & Katsioloudes, 2014



First, the internet based ICT creates financial benefit such as the reduction of operating cost, distribution cost, communication cost, and administration cost, it also enhancing the sales performance. The uses of internet also make the communication with the business partner become better that resulting better coordination of value chain and better speed of delivery. Then it is affecting the services too. The adoption of internet based ICT is proven to create an effective communication with customers so the firms are able to fulfill customers' requirements and create closer relationship with the customers. This situation would lead to better customers' experience and enhance customers' satisfaction. Furthermore, the main benefit that the internet based ICT could offer in this globalization era is the opportunity to access the global and larger market. By adopting the internet based ICT, SMEs would be able to access the market information and knowledge.

Despite of the numerous findings about the advantages on the use of internet based ICT in business process, the internet adoption among SMEs is still low, especially in developing country (Kontelnikov, 2007; Tan *et al.*, 2009; Ghobakhloo *et al.*, 2010). This situation is contrary with the SMEs in developed country where the adoption of internet based ICT among its SMEs is significantly growing, especially in United States and Europe (Awa *et al.*, 2014). Several studies report that the slow rate of internet adoption in developing country is due to some barriers. These barriers come from the internal and also from the external firms. From the internal one, the lack of qualified human resources to use, maintain, and develop the technology is considered as the challenge in adopting internet based ICT in SMEs. Moreover, the SMEs owner perception toward the suitability of Internet adoption on their business is also stated as the internal barrier (Olatakun & Bankale, 2016). As for the external one, the infrastructures become the main concern on adopting the internet based ICT. Unlike the well-developed infrastructure in developed country, developing country still struggling on accessing well qualified infrastructures with affordable cost (Molla & Licker, 2005; Ghobakhloo *et al.*, 2011). Furthermore, the government readiness to assist and regulate the internet based business in developing country is also mentioned by Tan *et al.* (2009) as the barrier from the external firms. Thus, in order to understand the internet based ICT adoption among SMEs, it is pivotal to examine the influencing factors behind it.

Theoretical Framework of Internet Adoption

By drawing upon literature, previous studies use several theories to examine the influencing factors of Internet adoption. The most common theories for internet adoption in SMEs in previous studies are Technology Acceptance Model (TAM) writers by Albakri & Kalsiolouides (2014); Awa *et al.* (2014), Technology Organization and Environment (TOE) writers by Zhu *et al.* (2003); Alqirim (2007); Zhao (2010); Ghobakhloo *et al.* (2011); Sila (2013); Jahongir & Shin (2014); Rahayu & Day (2015); Setiowati *et al.* (2015), and Theory of Planned Behaviour (TPB) writers by Awa *et al.* (2014).

Based on the previous studies, the TOE is deemed suitable to examine the factor of SMEs internet adoption. Unlike the other two frameworks, TAM and TPB, which are originally developed to assess on individual level of technology acceptance, the TOE was designed to examine the technology acceptance in organizational context (Rahayu & Day, 2015). TOE was developed by Tornatzky and Fleisher in 1990. This framework consists of three contexts that influence the technology adoption in a firm, they are: technological context, organizational context, and environmental context.

Technological Context

Technological context is related with the technologies that relevant with the firms, internal and externally (Zhu *et al.*, 2003). In this study, the technological context is related with the perceived benefit (Premkumar, 2003; AlQirim, 2007; Ghobakhloo *et al.*, 2011; Rahayu & Day, 2015), perceived ease of use (Premkumar, 2003; Sila, 2013), and cost (Premkumar, 2007; Ghobakhloo *et al.*, 2011; Sila, 2013).

Perceived benefit is defined as the benefit from the used of internet based ICT for the company and customers. Previous studies state this factor shows significant relationship with ICT adoption in SMEs, since in SMEs, the owner perceived benefit towards a system would really affect the final decision on adopting the system (Ghobakhloo *et al.*, 2011). According to this finding, this study would like to propose:

H1: The greater Perceived Benefit (PB) of internet based ICT, the more likely internet based ICT would be adopted by Indonesian SMEs.

Perceived ease of use is also known as the complexity. It is defined as to what extent an innovation is perceived as complex to understand and use (Premkumar, 2003). Sila (2013) mention that less difficult innovation would be preferable to adopt. Thus, this study proposes:

H2: The greater Perceived Ease (PE) of use of internet based ICT, the more likely internet based ICT would be

adopted by Indonesian SMEs.

Considering most SMEs operate on limited financial resource, the adoption cost would become the consideration in the decision to adopt new system (Ghoobakhloo *et al.*, 2011). The high cost of adoption is already mentioned as one of the barriers in adopting the internet based ICT in SMEs, especially in developing country (Sila, 2013), on that account the cost effectiveness is considered as the factor on adopting innovation.

H3: The lesser the Cost (CO) for internet based ICT, the more likely internet based ICT would be adopted by Indonesian SMEs.

Organizational context

The organizational context refers to the firm's characteristic. There were various variables to measure the organizational context from previous studies, such as: firm scope and size (Zhu *et al.*, 2003; Premkumar, 2007; AlQirim, 2007; Ghobakhloo *et al.*, 2011; Sila, 2013), top management support, communication channel, managerial time, information intensity (Premkumar, 2007; AlQirim, 2007), CEO's knowledge, CEO's innovativeness (Ghoobakhloo *et al.*, 2011). In this study, we use the following factors: firm size (Zhu *et al.*, 2003; Premkumar, 2007; AlQirim, 2007; Ghobakhloo *et al.*, 2011; Sila, 2013), CEO's knowledge (Premkumar, 2003; Ghobakhloo *et al.*, 2011; Sila, 2013), and CEO's innovativeness (Ghoobakhloo *et al.*, 2011).

The firm size is mostly found in innovation adoption literatures (Sila, 2013). It is because the larger size enterprises have several benefits than small enterprises like SMEs, such as: have more resources to adopt the internet based ICT business, more financial resources, and more power to encourage the trading partner to adopt the same technology (Ghoobakhloo *et al.*, 2011). Thus the size of the firm would affect the internet based IT adoption in SMEs.

H4: The bigger the firm (FS), the more likely internet based ICT would be adopted by Indonesian SMEs.

As mentioned before, the main decision on new system adoption in SMEs is mostly in the hand of the SMEs owner. For that reason, if the CEOs have an adequate knowledge about the benefits and the use of internet based ICT, the firms would more likely to adopt the system (Ghoobakhloo *et al.*, 2011). Sila (2013) also mention that the positive attitude from the top management, in this case the SMEs owner, toward the change would lead the firm to accept the innovation easier.

H5: The greater the CEO's Knowledge (CK) about the internet based ICT, the more likely internet based ICT would be adopted by Indonesian SMEs.

Ghoobakhloo *et al.* (2011) propose that aside from the CEO's knowledge, CEO's innovativeness also affecting the SMEs owner decision to adopt the internet based ICT in business process. They found that that the degree of innovation has positive relation with the adoption of ICT.

H6: The greater the CEO's Innovation (CI) about the internet based ICT, the more likely internet based ICT would be adopted by Indonesian SMEs.

Environmental Context

Environmental context is related with the factors in areas of operation. This study uses three factors to measure the environmental context: competitor (Zhu *et al.*, 2003; Premkumar, 2003; AlQirim, 2007; Ghobakhloo *et al.*, 2011; Sila, 2013), government (Zhu *et al.*, 2003; AlQirim, 2007), and pressure from buyer/supplier.

Numerous studies have proposed competitor pressure as the influencing factors in many innovation literatures (Zhu *et al.*, 2009). It is stated that one of the reason for SMEs to adopt new technology is to stay competitive in the market (Tan *et al.*, 2009). Several researches support this view, since gaining competitive benefit in larger market is one of the benefit in adopting internet based ICT (Kotelnikov, 2007; Lester & Tran, 2008; Tan *et al.*, 2009; Ghobakhloo *et al.*, 2011; Eng, 2008b).

H7: The greater the Competition (CT) in the business environment, the more likely internet based ICT would be adopted by Indonesian SMEs.

Government assistance and willingness to regulate the internet based business is mentioned as one of barriers to adopt internet based ICT in SMEs (Tan *et al.*, 2009). Thus several studies state that government is one of the influencing factors in ICT adoption among SMEs (Ghoobakhloo *et al.*, 2011).

H8: The greater Government (GV) support toward internet based ICT, the more likely internet based ICT would be adopted by Indonesian SMEs.

Pressure from buyer means that the consumers are already adopted the Internet based ICT, so does the pressure from the supplier. It indicates the readiness of the market. Zhu *et al.* (2009) define consumer readiness as the combination of consumer willingness to engage in Internet and Internet penetration in the population. It is an



important factor since it reflects the potential market and consumer understanding toward the new ICT innovation (Awa *et al.*, 2014).

H9: The greater pressure from buyer/supplier (PBS) toward Internet based ICT, the more likely Internet based ICT would be adopted by Indonesian SMEs.

In general, this study propose three influencing factors on internet based ICT adoption in Indonesian SMEs based on the TOE framework. Thus we propose the conceptual model for this study as present in figure 1.

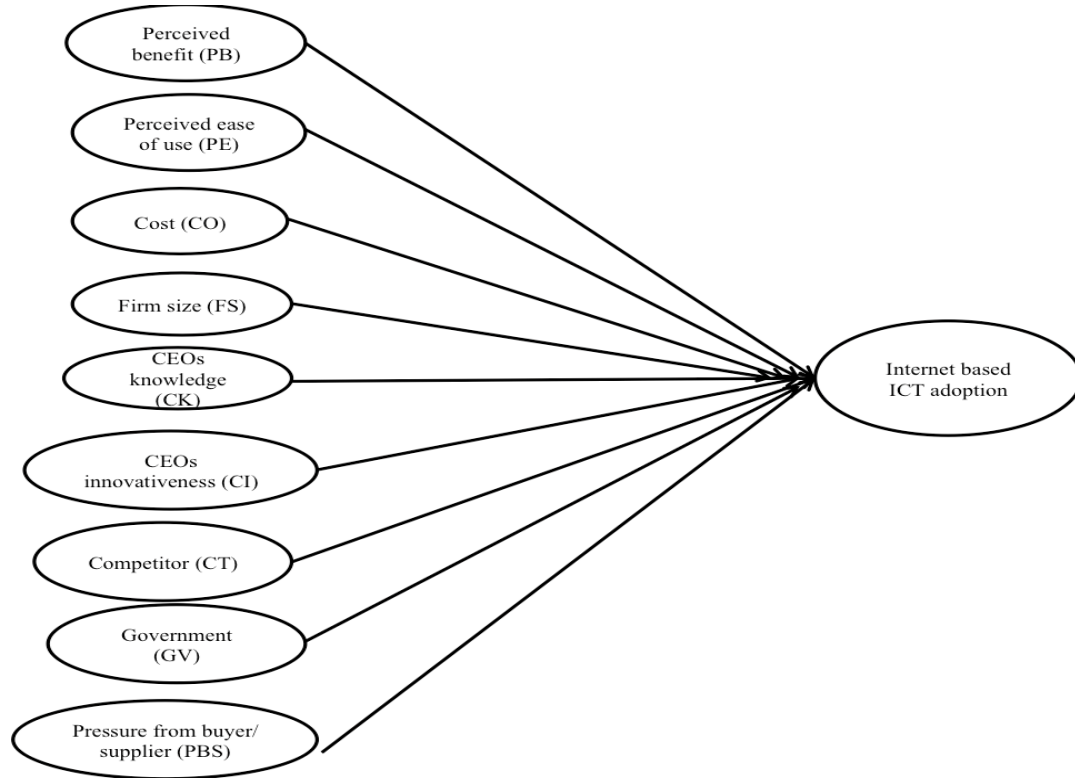


Figure 1. Internet Based ICT Adoption Framework

3. Methodology

This study is aimed to examine the influencing factors of internet based ICT among SMEs. We conducted this study by using quantitative approach. Questionnaire based survey is deemed suitable method for this study to examine the influencing factors of internet based ICT adoption among SMEs. This study was analyzed using SPSS version 22 for demographic analysis and Partial Least Square (PLS) Path Modeling with R (Sanchez, 2013) for analyzing the factors influencing internet based ICT adoption.

Instrument Development

This study use TOE framework to explain the internet based ICT adoption. The internet based ICT adoption factors is measured through nine variables that developed from several previous studies about internet based ICT adoption in SMEs (Premkumar, 2003; AlQirim, 2007; Ghobakhloo *et al.*, 2011; Sila, 2013), resulting 35 items questionnaire using five points Likert scale. As for the dependent variable, this study assisted the adoption of internet based ICT among SMEs through the questions about internet based ICT application used by SMEs.

Sampling and Data Collection

This study is conducted in Indonesia, specifically in Cirebon, West Java where the Batik Trusmi SMEs is growing.

Batik is traditional fabric from Indonesia. Batik is crowned as *intangible world heritage* by United Nations Educational, Scientific, and Cultural Organization (UNESCO) in 2009 and mostly Batik is introduced through SMEs. Batik Trusmi is named after the Trusmi area in Cirebon, West Java, Indonesia, where numerous batik artists are reside there. As the central area for Batik Industry in Cirebon, West Java, the SMEs number focusing on Batik Trusmi is growing (Borshalina, 2014). We use convenience-sampling method for this study. The questionnaires were distributed directly to the SMEs owners only, since the decision to adopt innovation is mostly decide by the SMEs owner (Ghobakhloo *et al.*, 2011). From the period of July 7th until July 18th, 2016, we got 201 responds from the owners of batik trusmi SMEs. However only 193 questionnaires that suitable for further process due to the incomplete responds.

4. Result and Discussion

Demographic

Based on the result of the questionnaire based survey, most of the SMEs owner of Batik Trusmi have Senior High School degree (72%). Though the number of male owner is higher than the females, the number difference is not really big. There are 48.7% female owner and 51.3% male owner. As for the firm level, based on the total asset, most of the SMEs in Batik Trusmi are micro firm (79.8%). We also measured the internet based ICT adoption level based on Deloitte (2015). The result indicated that the majority of the firms still on the basic level (86.5%). Only 1% from the total sample have already reached the advance level of internet adoption. Table 2 shows the demographic of this study:

Table 2. Demographic

	Frequency (n)	Percentage (%)
Education:		
Elementary school	3	1.6
Junior high school	25	13.0
Senior high school	139	72.0
Diplome	15	7.8
Undergraduate	11	5.7
Firm level		
Micro	154	79.8
Small	28	14.5
Medium	11	5.7
Internet adoption level		
Offline	8	4.1
Basic	167	86.5
Intermediate	16	8.3
Advance	2	1.0

Measurement Model

Prior to model and hypotheses testing, we examined the measurement model by assessing the reliability, convergent validity, and discriminant validity (Sanchez, 2013). It is aimed to see how well the measurements represent each construct (Chin, 2010). For checking the reliability, the Cronbach's Alpha, the Dillion-Goldstein's rho, and eigenvalue of each item were examined. As for the validity, the Average Variance Extracted (AVE) Value was assessed to see the convergent validity and factor loading and cross loading of each item for the discriminant validity.

Based on the PLS result, the Cronbach's alpha were higher than 0.7 in most indicators except for CI (0.545) and CT (0.357), the Dillion-Goldstein's rho were higher than 0.7 in most indicators except the CT (0.664), and all the indicators had eigenvalues greater than 1. It indicated that the scale were reliable with the exception of CI and CT. Furthermore, we examined the result of convergent validity and discriminant validity on each item. For the AVE value, only CT (0.356) and PB (0.328) had value lower than 0.5. Then for the factor loading, we found several items with low factor loading: CT2, PB4, PB5, PB6, PB8, PB10; and three items that showed cross loading: CK5, CT2, and PB5. The results suggested that there were several items invalid for the measurement model. Thus we deleted some inappropriate items (Sanchez, 2013). Table 3 and Table 4 indicate the sufficient



reliability and validity for all the measurement after deleting some items.

Table 3. The Reliability and Validity of Indicators

	C.Alpha	DG.rho	Eig.1 st	AVE
PE	0.866	0.909	2.86	0.714
CO	0.927	0.954	2.62	0.874
FS	1.000	1.000	1.000	1.000
CI	0.642	0.848	1.47	0.736
CK	0.902	0.936	3.79	0.754
CT	1.000	1.000	1.000	1.000
GV	1.000	1.000	1.000	1.000
PBS	0.756	0.846	2.32	0.574
PB	0.671	0.802	2.02	0.485

Table 4. Loadings and Cross Loadings Values for The Indicators in The Model

	PE	CO	FS	CI	CK	CT	GV	PBS	PB
PE									
PE1	0.8862								
PE2	0.7746								
PE3	0.8525								
PE4	0.8622								
CO									
CO1		0.8780							
CO2		0.9660							
CO3		0.9580							
FS									
FS1			1.0000						
CI									
CI1				0.8743					
CI2				0.8408					
CK									
CK1					0.9554				
CK2					0.9368				
CK3					0.9526				
CK4					0.9266				
CK6					0.4598				
CT									
CT1						1.0000			
GV									
GV1							1.0000		
PBS									
PBS1								0.8755	
PBS2								0.7498	
PBS3								0.6048	
PBS4								0.7038	
PB									
PB1									0.8424
PB3									0.6302
PB7									0.6527
PB9									0.6371

We deleted 8 items: CT2, CT3, CT5, PB2, PB4, PB6, PB8, and PB10. Resulting most the indicators had Dillon-Goldstein’s rho higher than 0.7, eigenvalues greater than 1, and Cronbach’s Alpha greater than 0.7. As for the two previous indicators with low Cronbach’s Alpha value, they showed increasing values (CI: 0.642 and CT:

0.671), which are still considered acceptable for reliability test (Sekaran, 2003). In conclusion, after deleting several items, the result indicated that the scale was reliable. For the validity test, there were no more cross loading factors founded, yet for the AVE value, the PB's was still below 0.5 (PB: 0.485). However since previous studies mention PB as important factors in technology adoption (Ghoobakhloo, 2011), we still keep the indicator further.

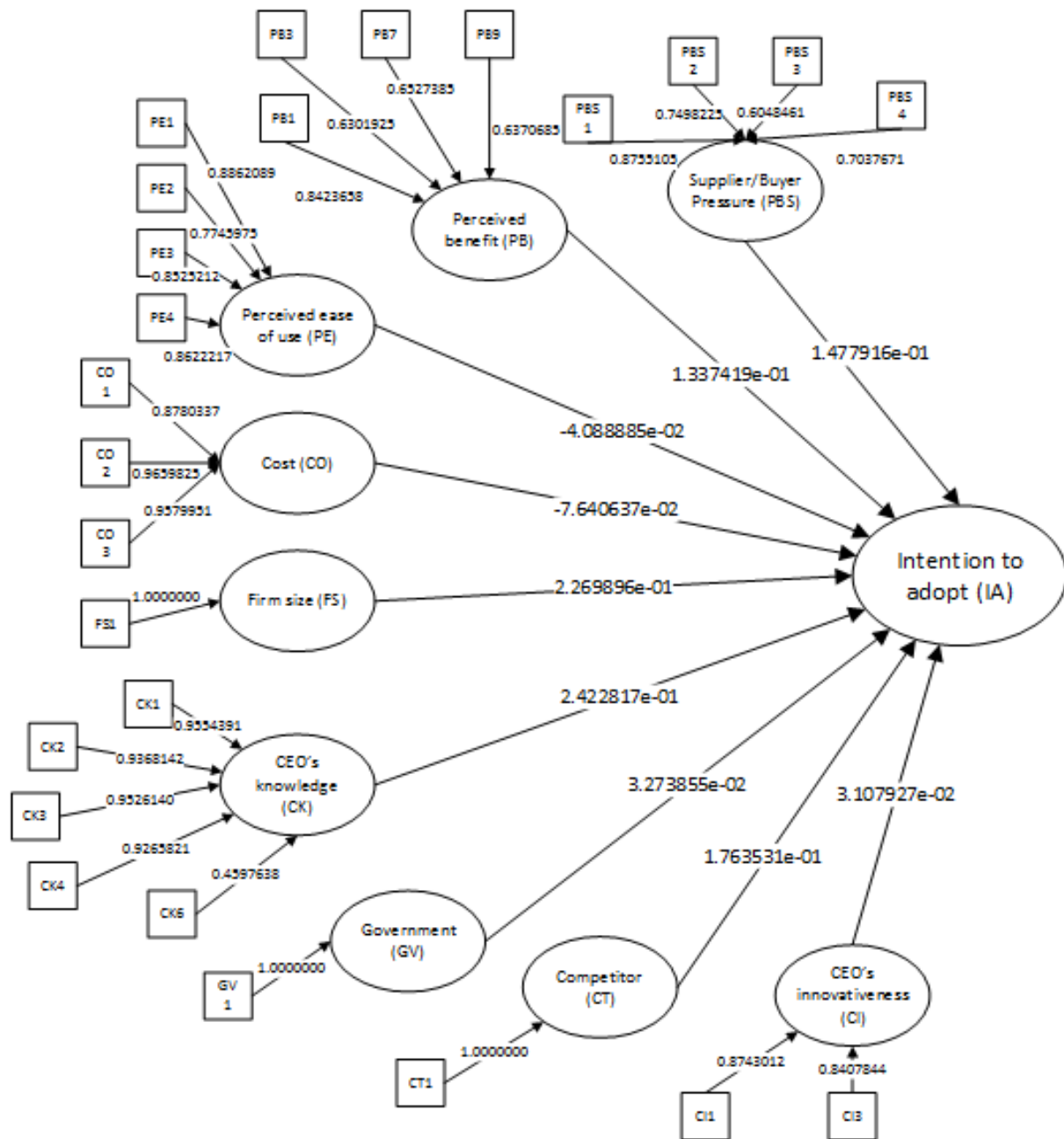


Figure 2. PLS Model on Internet Based ICT Adoption.

Structural Model Assessment

The structural model assessment is aimed to examine the quality of the model. According to Sanchez (2013) there are three indices to assess the structural model: first, the R² to see the amount of impact of particular independent



latent variable on dependent latent variables. Second, the redundancy value, it is aimed to see how well the independent latent variables predict values of the indicators in endogenous variables. And the last one is Goodness of Fit (GoF), to see the quality of both measurement and structural models. Based on the PLS result, the R^2 value for this model is 0.304, the redundancy value was 0.304, and the GoF was 0.453. It indicated that the model was acceptable (Sanchez, 2013). Figure 1 shows the PLS SEM:

Hypothesis Testing and Discussion

To examine the relevance and the significant of the structural model relationship, we assess the size of path coefficients (to see the relevance of the relationship) and the t values (to see the significance of relationship). Based on the result, CK has the biggest effect on IA (0.242), followed by FS (0.227), CT (0.176), PBS (0.148), PB(0.134), and CO (-0.076).

Table 5. t-values (Path Coefficients Significance)

	Path Coefficient (β)	t-values
PE – IA	-0.040	-0.427
CO – IA	-0.076	-1.000
FS – IA	0.227	3.317
CI – IA	0.031	0.430
CK – IA	0.242	3.000
CT – IA	0.176	2.630
GV – IA	0.032	0.404
PBS – IA	0.148	1.860
PB – IA	0.134	1.590

Most of the paths were statistically significant (t-values>0.98) (Hair *et al.*, 2014), except for: PE – IA (-0.427); CI – IA (0.430); and GV – IA (0.404). The results then were used to test the hypotheses of this study.

Hypotheses 1:

The greater Perceived Benefit (PB) of internet based ICT, the more likely internet based ICT would be adopted by Indonesian SMEs.

The result shows that there is positive relation between Perceived of Benefit and internet based ICT adoption. Thus the H1 is accepted. ($\beta=0.134$, t-values>0.98). This finding is inline with the study by Ghobakhloo *et al* (2011), the CEOs perception toward the usefulness of the technology would positively affect the technology innovation.

Hypotheses 2:

The greater Perceived Ease of use (PE) of internet based ICT, the more likely internet based ICT would be adopted by Indonesian SMEs.

The path coefficient showed significant negative relation between the perceived ease of use and internet based ICT adoption ($\beta= -0.040$, t-values>0.98), so the perceived ease of use have no significant relationship with internet based ICT adoption. It means that the H2 is rejected. It is line with the previous study by Grandon & Pearson (2004) where the perceived ease of use did not show significant effect on e-commerce adoption in Chile SMEs.

Hypotheses 3:

The lesser the Cost (CO) for internet based ICT, the more likely internet based ICT would be adopted by Indonesian SMEs.

The result showed negative relation between cost and internet adoption ($\beta=-0.076$, t-values>0.98). It indicates that the lesser the cost, the more likely internet based ICT would be adopted. Thus the H3 is accepted. Financial matter is one of the issues in Indonesian SMEs (Tambunan, 2009), it makes the cost consideration would not be a surprising influencing factor in internet adoption (Ghobakhloo *et al.*, 2011; Sila, 2013).

Hypotheses 4:

The bigger the Firm (FS), the more likely internet based ICT would be adopted by Indonesian SMEs.

There was significant positive relationship between the firm size and internet based ICT adoption. On that account, H4 is accepted ($\beta= 0.227$, t-values>0.98). According to the result of this study, firm size has the second biggest effect on Internet based ICT. As mentioned before, the larger companies have several privileges that the small firms do not possess: financial, resources, and power (Ghobakhloo *et al.*, 2011). Furthermore, this study also

strengthening this finding by presenting the demographic data where most of the SMEs in this study are in micro level with basic level internet adoption.

Hypotheses 5:

The greater the CEO's Knowledge (CK) about the internet based ICT, the more likely internet based ICT would be adopted by Indonesian SMEs.

The result showed positive relationship between CEOs knowledge and internet based ICT adoption. Thus the H5 is accepted ($\beta = 0.242$, $t\text{-values} > 0.98$). CEO's knowledge have the biggest effect on internet based ICT adoption among Indonesian SMEs. As the main decision maker in the firms, the knowledge of the owners about innovation would be affecting the innovation adoption (Ghobakhloo, 2011; Sila, 2013). Particularly in Indonesian SMEs where the firms mostly do not have management level. So, every decisions based solely in one person.

Hypotheses 6:

The greater the CEO's Innovation (CI) about the Internet based ICT, the more likely internet based ICT would be adopted by Indonesian SMEs.

The result shows that the relationship between CEO's innovativeness and internet based ICT adoption is not significance, thus the H6 is rejected ($\beta = 0.031$, $t\text{-values} < 0.98$). The finding indicated that the CEO's innovativeness do not influence the internet based ICT adoption.

Hypotheses 7:

The greater the Competition (CT) in the business environment, the more likely internet based ICT would be adopted by Indonesian SMEs.

There was significant relationship between competition and internet based ICT adoption, so the H7 is accepted ($\beta = 0.716$, $t\text{-values} > 0.98$). Competitor factor is following CEO's knowledge and firm size as the biggest influencing factor in internet based ICT adoption. As the main objective of adopting technology is to gain competitive advantages in the global market (AlQirim, 2007), this finding inline with previous studies by Zhu *et al* (2009) who mentioned competitor pressure as the influencing factors that mostly find in many innovation literatures. This statement also supported by Kotelnikov, 2007; Lester & Tran, 2008, and Eng, 2008b).

Hypotheses 8:

The greater Government (GV) support toward internet based ICT, the more likely internet based ICT would be adopted by Indonesian SMEs.

There was no significant relationship between government support toward internet based ICT adoption. For that reason, the H8 is rejected ($\beta = 0.032$, $t\text{-values} < 0.98$). Unlike the previous studies about internet adoption in developed country where government became one of the factors in internet adoption, this study shows otherwise. The possible explanation of this finding might be the lack of the government readiness to assist and regulate the internet based business in developing country (Tan *et al.*, 2009), particularly in Indonesia (Tambunan, 2009).

Hypotheses 9:

The greater Pressure from Buyer/Supplier (PBS) toward internet based ICT, the more likely internet based ICT would be adopted by Indonesian SMEs.

The result shows significant relationship between pressure from buyer/supplier toward internet based ICT adoption. Thus the H9 is accepted ($\beta = 0.148$, $t\text{-values} > 0.98$). The pressure from buyer to adopt the internet based ICT means that the consumers are already using the technology. It indicates that there is market existing for this kind of innovation (Zhu *et al.*, 2009). The pressure is not only come from the consumers, but also from the supplier, particularly if the supplier is a larger firm. Ghobakhloo *et al* (2011) argue that the larger firms are having the power to pressure their smaller trading partner to adopt the innovation for the sake of their own efficiency.

In summary, there are six influencing factors on internet based ICT adoption in Indonesian SMEs are found in this study, they are: CEO's knowledge, firm size, competitor, pressure from buyer/supplier, perceived benefit, and cost. Figure 3 presents the summary of the hypotheses; the black arrow indicates that the independent variables are influencing the dependent, while the red one are not.



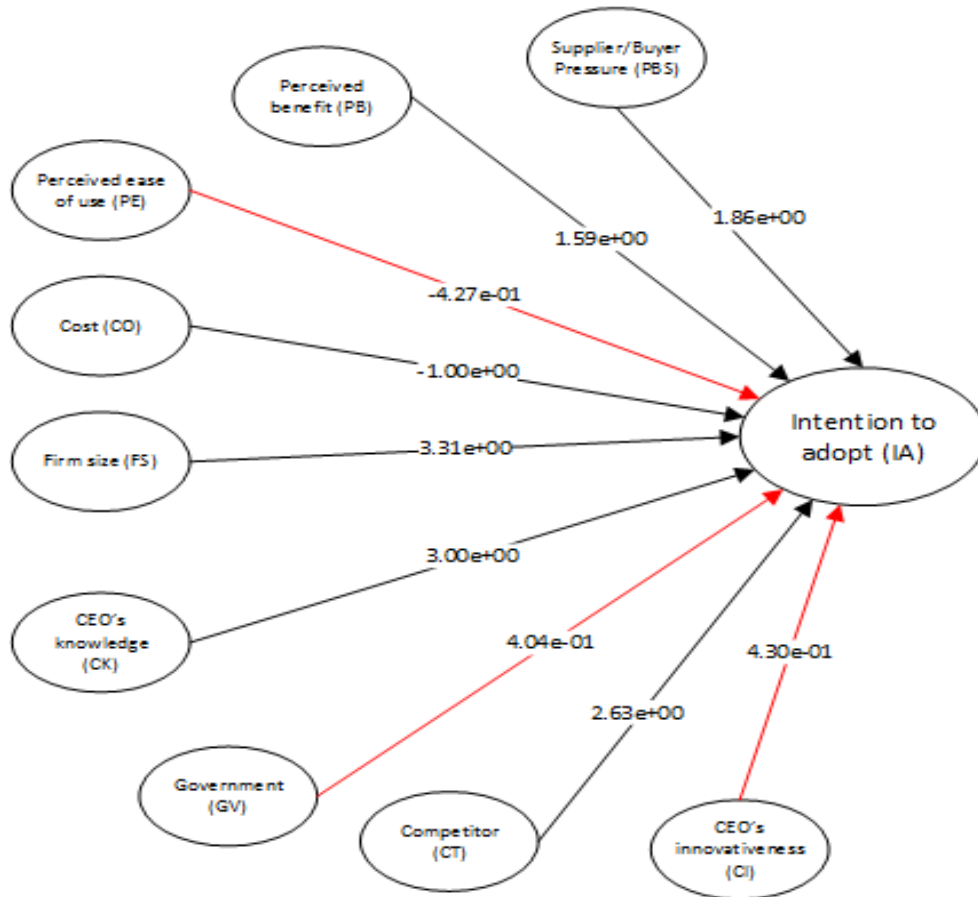


Figure 3. The Hypotheses Summary

5. Conclusions & Limitation

By using the Partial Least Squares Structural Equation Model (PLS-SEM), we conducted the study about factor influencing the internet based ICT adoption among Indonesian SMEs, especially in Batik Trusmi, Cirebon, West Java. We proposed nine hypotheses based on the Technology Organization Environment (TOE) framework. The results accepted six hypotheses: CEO's knowledge, firm size, competitor, pressure from buyer/supplier, perceived benefit, and cost. As for the perceived ease of use, CEOs innovativeness, and government, do not significantly influence the internet based ICT adoption in Indonesian SMEs.

Further study with bigger sample size is suggested to confirm the model. Moreover, the combination of several technology adoption frameworks is also proposed for enriching the ICT adoption literature, particularly in Indonesian SMEs.

References

- Al-Qirim, N. (2007). "The adoption of e-commerce communications and application technologies in small business in New Zealand". *Electronic Commerce Research and Applications*, 6, 462-473.
- Alam, S.S., Khatibi, A., Ahmad, M.I.S., and Ismail, H.B. (2007). "Factors effecting e-commerce adoption in the electronic manufacturing companies in Malaysia", *International Journal of Commerce and Management*, Vol.17, No.1/2, pp.125-139.
- Albakri, A.A and Katsioloudes, M.I. (2014). "The factors affecting e-commerce adoption by Jordanian SMEs". *Management Research Review*, Vol.38, No.7, pp.726-749.
- Awa, H.O., Ojiabo, O.U., and Emecheta, B.C. (2014). "Integrating TAM, TPB, and TOE frameworks and expanding their characteristic constructs for e-commerce adoption by SMEs". *Journal of Science &*

Technology, Vol.6, No.1, pp.76-94.

- Borshalina, T. (2014). "Marketing strategy and the development of batik trusmi in the regency of Cirebon which used natural coloring matters". *Procedia Social and Behavioral Sciences* 169, 217- 226.
- Chin, W.W. (2010). *How to Write Up and Report PLS Analyses*. Book chapter from *Handbook of Partial Least Squares*, Springer.
- Deloitte. (2015). "SMEs powering Indonesia's success, the connected archipelago's growth engine". *Deloitte Access Economics*.
- Economist Intelligence Unit (2010). "Digital Economy Rankings 2010: beyond e-readiness". A report from the Economist Intelligence Unit.
- Eng, Teck Yong. (2008a). "The effects of the internet on network structures and business performance". *Electronic Markets*, 18:1, 91-101.
- Eng, Teck Yong. (2008b). "E-customer service capability and value creation", *The service Industries Journal*, 28:9, 1293-1306.
- Ghobakhloo, M., Arias-Aranda, D., and Benitez-Amado, J. (2011). "Adoption of e-commerce applications in SMEs", *Industrial Management & Data Systems*, Vol. 111, No.8, pp.1238-5577.
- Hair, J.F., Ringle, C.M., Hpins, L., and Kuppelweiser, V.G. (2014). Partial least squares structural equation modeling (PLS SEM): An emerging tool in business research. *European Business Review*, 26(2), 106-121.
- Indonesian Ministry of Cooperatives and Small Medium Enterprises. (2013) "Perkembangan data usaha mikro, kecil, menengah (UMKM) dan usaha besar (UB) tahun 2012-2013". Available at: <http://www.depkop.go.id/berita-informasi/data-informasi/data-umkm/> 2013
- Jahongir, A and Shin, H.K. (2014). "Factors influencing e-commerce adoption in Uzbekistan SMEs". *Management Review: An International Journal*, Vol. 9, No. 2.
- Kontelnikov, Vadim. (2007). "Small and medium enterprises and ICT". United Nations Development Programme – Asia Pacific Development Information Programme (UNDP-APDIP).
- Lester, D.L and Tran, T.T. (2008). "Information technology capabilities: suggestions for SME growth", *Institute of Behavioral and Applied Management*.
- Molla, A and Licker, P.S. (2005). "E-commerce adoption in developing countries: a model and instrument". *Information & Management*, 42, 877-899.
- Olatakun, W and Bankole, B. (2011). "Factors influencing electronic business technologies adoption and use by small and medium scale enterprises (SMES) in a Nigerian municipality". *Journal of Internet Banking and Commerce*, Vol.16, No.3.
- Premkumar, G. (2003). "A meta-analysis of research on information technology implementation in small business". *Journal of Organizational Computing and Electronic Commerce*, 13;2, 91-121.
- Rahayu, R., and Day, J. (2015). "Determinant factors of e-commerce adoption by SMEs in developing country: evidence from Indonesia". *Procedia – Social and Behavioral Sciences*, 195, 142-150.
- Sanchez, G. (2003). *Path Modelling With R*. Trowchez Editions: Berkeley.
- Setiowati, R., Hartoyo., Daryanto, H.K., and Arifin, B. (2015). "The effects of ICT adoption on marketing capabilities and business performance of Indonesian SMEs in the fashion industry". *Journal of Business and Retail Management Research*.
- Sila, Ismail. (2013). "Factors affecting the adoption of B2B e-commerce technologies". *Electron Commer Res*, DOI 10.1007/s10660-013-9110-7
- Tambunan, T. (2009). Export-oriented small and medium industry clusters in Indonesia. *Journal of Enterprising Communities*, Vol.3, No1, pp.25-58.
- Tan, K.S., Chong, S.C., Lin, B., and Eze, U.C. (2009). "Internet-based ICT adoption among SMEs. *Journal of Enterprise Information and Management*, Vol. 23, No.1, pp.27-55.
- Thurasamy, R., Mohamad, O., Omar, A., and Marimuthu, M. (2009). "Technology adoption among small and medium enterprises (SMEs): a research agenda". *Proceedings of World Academy of Science, Engineering and Technology*, Vol. 41, 2070-3740.
- Zhao, Jian. (2010). "Study on adoption of e-commerce in SMEs", *Management Engineering*, 01, 1838-5745.
- Zhu, K., Kraemer, K., and Xu, Z. (2003). "Electronic business adoption by European firms: a cross-country assessment of the facilitators and inhibitors". *European Journal of Information Systems*, 12, 251-268.

