International Research Journal of
BUSINESS STUDIES

ISSN: 2089-6271

Vol. 8 | No. 1

# Understanding ICT Adoption Determinants among Indonesian SMEs in Fashion Subsector

Rini Setiowati*, Hartoyo**, Heny K. Daryanto***, Bustanil Arifin****

* Bogor Agricultural University, Bogor & Bina Nusantara University, Jakarta
**, *** Bogor Agricultural University, Bogor
**** University of Lampung, Bandar Lampung

ARTICLE INFO

*Keywords*:
ICT adoption,
TOE framework,
SMEs,
fashion subsector,
Indonesia

ABSTRACT

This paper investigates factors that affect the adoption of Information Communication and Technology (ICT) among SMEs in fashion subsector in Indonesia. This study adopts Technology, Organization, and Environment (TOE) framework which consist technological factors such as relative advantage, compatibility, complexity, trialability, observability; organizational factors such as owner/manager IT knowledge, owner/manager innovativeness;and environmental factors namely competitive pressure, market turbulence, and institutional intervention. A questionnaire-based survey was used to collect data from 204 SME owners/managers. The results show that under technological factors, compatibility, complexity, trialability, and observability significantly and positively influence ICT adoption. However, relative advantage and complexity have significant but negative influence on ICT adoption. Moreover, the organizational factors namely owner/manager's knowledge and innovativeness also contribute significantly to the adoption. Furthermore, among three environmental factors, competitive pressure and institutional intervention are determinants that influence ICT adoption in SMEs, whereas market turbulence shows no significant contribution toward the adoption of ICT. This study provides valuable insights for government and policy makers as well as for SMEs owner/managers to develop strategies that promote and foster the adoption of ICT.



Corresponding author:
setiowati.rini@gmail.com

## INTRODUCTION

Information and communication technology (ICT) refers to a wide range of computerized technologies that enable communication to capture, process and transmit information. They include products and services such as desktop computers, laptops, handled devices, wired or wireless intranet, software, data storage, network security and so forth (Ashrafi and Mirtaza, 2008).

A number of empirical studies on ICT adoption at the organizational level reveals that ICT adoption

provide strong support for institution-based variables as predictors of adoption intention to provide inter-organizational linkage (Teo et al., 2003).Premkumar and Roberts (1999) note that relative advantage, top management support, organizational size, external pressure, and competitive pressure are important determinants of ICT adoption.

**SMEs and ICT Adoption**

The definition of SMEs varies from one country to another,howeverthemostcommonmeasurements used to classify the different sizes of business establishmentsare total assets,annual sales and number of workers employed by the business. Based on Government Decree No. 20, 2008, SMEs in Indonesia are divided into three categories; 1) Micro Scaled Businesses: businesses with total net assets less than or equal to IDR 50,000,000 (lands and buildings are excluded), or with annual sales of less than or equal to IDR 300,000,000; 2) Small Scaled Businesses: businesses with total net assets between IDR 50,000,000 and 500,000,000 (lands and buildings are excluded), or with annual sales between IDR300,000,000 and 2,500,000,000; 3) Medium Scaled Businesses: businesses with total net assets between IDR 500,000,000 and IDR 10,000,000,000 (lands and buildings are excluded), or with annual sales between IDR 2,500,000,000 and IDR 50,000,000,000.

In 2011, the number of SMEs in Indonesia grew 2.57% to reach 55.5 million businesses. Between 2006 and 2011 the total number of SMEs rose by around12.6%. Also, in 2011 small-scaled businesses held the highest growth rate of 4.98% followed by medium-scaled businesses with 3.87% growth rate. SMEs also have an important role in the share of employment by providing jobs that can drive Indonesia's economy. SMEs provided jobs for almost 97.3% of the country's workforce in 2011, about 101.7 million people, and an increase of 3.55% from the 2010 figure of 99.4 million people.

The information and communication technology has changed the way various organizations conduct their business. The use of ICT provides the opportunity for organizations to reach their customers anytime and anywhere, and may enable a firm to gain a competitive advantage over its competitors (Li, 2008). Previous studies on SMEs stated that the most prevalent benefits of Internet and ICT adoption in SMEs included improved company image, more effectiveness in collecting information on customers, increased productivity (Walczuch R., Braven, G.V., Lundgren, 2000 in Tan et al. 2010).

Regardless of the benefits of ICT to a firm's performance, the ICT adoption of SMEs in Indonesia is still considerably slow. The majority of SMEs still have no presence or only static Internet presence. According a survey conducted by PT MARS Indonesia in 2011 among 1718 SMEs in eight major cities in Indonesia, namely Jabodetabek (Jakarta, Bogor Depok, Tangerang and Bekasi), Bandung, Semarang, Yogyakarta, Solo, Surabaya, Medan, and Makasar, 67% of SMEs use email for their business activities whereas 33% of them do not use email at all. Regarding the use of websites, 70% of SMEs have them and only 29.5% do not. Moreover, most of the payments are not conducted on the firms' websites, meaning that mostly their websites do not have a fully integrated transaction mechanism since most of the payments are through bank transfer/ATM (54.5%) and/or through cash on delivery mechanism (47.3%). Only 8.9% of the transactions use credit card payment.

Several studies have been conducted to examine the factors contributing to the slow rate of ICT adoption in SMEs, and the results have highlighted various adoption barriers. Among the most widely cited barriers include a lack of knowledge and understanding of the benefits of ICT, concerns about security and privacy, lack of skilled workers, computer technology not being widely used in the business operation, cultural barriers, and lack of financial resources (Khatibi et al., 2003). In addition, Hadjimanolis, A. (1999)points out external barriers in Internet and e-commerce adoption is

categorized into supply barriers (the difficulties of getting financial and technical information), demand barriers (perceived usefulness of Internet for SME businesses), and environmental barriers (related to security issues). Internal barriers are divided into resource barriers (technical and managerial capabilities) and system barriers (the new system does not fit with the current system).

The above discussion indicates that SMEs have become a major driving force in Indonesia's economic development. But its vital contributions are hindered by several challenges in relation to the creation of increased market access, given the limited resources. ICT presence provides a solution to SMEs as it opens up new markets and opportunities.However, ICT adoption in Indonesia still considered relatively low. Therefore, this study aims to identify the important determinants that motivate SMEs to adopt ICT for their businesses by examining SMEs in fashion subsector.

The Ministry of Trade Republic of Indonesia (2008) defines fashion subsector as all creative activities related to the creation of clothing design, footwear, other fashion accessories, fashion apparel and accessories production, and the distribution of fashion products. Fashion subsector is also divided into fashion companies, fashion and distribution channels, and most of the companies follow mass production, distro, ready to wear and haute couture type of business models. The fashion subsector is an important sub-sector in Indonesia's creative industry. In 2010-2013, total number of firms in this industry reached 3.8 million firms. In addition, in the period between 2010 and 2013, fashion industry contributed to IDR 182 trillion (or equal to USD 13 billions)of Gross Value Added (GVA) with the growth rate of 6.44% (The Ministry of Tourism and Creative Industry of the Republic of Indonesia, 2014).

## Literature Review

Nowadays, Information Technology (IT) is regarded as an important tool in enhancing productivity of firms (Oliveira and Martins, 2011). Technologies (ICTs), particularly the use of Internet to conduct business have changed the way people do business. For SMEs, Internet is believed to be the most cost-efficient tool to help companies gain bigger markets and compete with larger companies in attracting their products, services, and information (Tan, et al., 2009).

Adoption of technology or innovation theories and models have been evolved over the years, at the individual level, the psychological contribution has resulted in the development of the Theory of Reasoned Action/TRA (Ajzen and Fishbein, 1980), which later has been extended into the Theory of Planned Behavior/TPB (Ajzen, 1985). These two theories are considered as the most used theories on technology adoption. Furthermore, at the firm level, Rogers introduces the model of Diffusion of Innovation in 1962, and then refined in 1971, 1983, and 2005, where the latest model incorporated the phenomena of Internet that change the nature of diffusion process. In addition, the Technology Organization and Environment/TOE framework was developed in 1990 (Tornatzky and Fleischer 1990) that identifies three aspects of an enterprise's context that influence the process by which it adopts and implements a technological innovation. The theory dedicates the adoption process at firm level and is an aggregation of other models including DOI.

### Technology, Organization, Environment Framework

The Technology, Organization, Environment (TOE) framework was developed in 1990 (Tornatzky and Fleischer, 1990). It identifies three factors that influence the process by which an organization adopts and implements a technological innovation. The three factors fall within each of the following contexts: technological context, organizational context, and environmental context.Technological context describes internal and external technologies that are relevant to the firm. It includes current practices and

equipment internal to the firm and the set of available technologies external to the firm (Hage, 1980). Meanwhile, organizational context refers to descriptive measures about firm such as the scope of the firm, size, and managerial structure. Finally, environmental context refers to arena in which a firm conducts its business, it includes industry where a firm operating, competitors, and government (Tornatzky and Fleischer, 1990).

The TOE framework later was adopted in IT adoption studies, provides a useful analytical framework that can be used for studying adoption and assimilation of different types of innovation. Also, It has a solid theoretical basis, consistent empirical support, and potential application across different studies (Oliveira and Martins, 2011).

In SMEs context, several studies have used TOE framework to analyze factors that contribute to the adoption of e-commerce or IT and Internet commerce in SMEs. Ghobakhloo,Aranda, and Amando (2011) note that e-commerce adoption within SMEs in Iran is affected by perceived relative advantage perceive compatibility, CEOs innovativeness, information intensity, buyers/ supplier pressure, support from technology vendors, and competition. In addition, Tan et al.'s study (2009) suggested that Internet-based ICT adoption provides a low cost yet effective communication tool for consumers, and from the inferential statistics reveal that relative advantage, compatibility, complexity, observability, and security are significant factors influencing Internet-based ICT adoption among Malaysian SMEs. A study conducted by Suharti et al. (2014) to tempe producers in Central Java, Indonesia reveal that technological attributes are the dominant factors in the adoption of technology adoption. Moreover, Shohaibet al. (2009) suggest that relative advantage is an influential predictor of Internet adoption. Furthermore, observability is found to be a significant variable in the adoption of ICT (Ramdaniet al., 2013; Wanyoikeet al., 2012). Thus, the following hypotheses are formulated:

**H1**: The relative advantage of ICT positively influences ICT adoption.
**H2**: The compatibility of ICT positively influences to ICT adoption.
**H3**: The complexity of ICT positively influences ICT adoption.
**H4**: The trialability of ICT positively influences ICT adoption.
**H5**: The observability of ICT positively influences ICT adoption.

Literature reviews reveal that SME owner-managers viewed as "more entrepreneurial, risk-takers, innovative and creative" are seen to be important to the firm readiness for ICT adoption (Zappala and Gray, 2006). Rayahu (2015) states that owner IT ability anf innovativeness are the determinant factors that influence Indonesian SMEs in their adoption of e-commerce. Also, several empirical studies have concluded the owner/manager/CEO knowledge of IS and innovativeness are significant to the adoption of technology (IT) (Alam and Noor, 2009; Scupola, 2009; Shiau et al., 2009; Haug et al., 2011; and Chao and Chandra 2012). Therefore, the following hypotheses are stated:

**H6**: owner manager IT knowledge positively influences ICT adoption.
**H7**: Owner/manager innovativeness positively influences ICT adoption.

The environmental context according to the TOE framework is an arena in which a firm conducts its business, it includes industry where a firm operating, competitors, and government (Tornatzky and Fleischer, 1990). Some studies elaborate the TOE framework with the institutional theory (Li, 2008; Soares-Aguiar and Palma-Dos-Reis, 2008) that includes external pressure(pressure from competitors and trading partners). Theenvironmental context in this study is limited into competitive pressure, market turbulence, and institutional intervention. Competitive pressure has long been recognized as one of factors influence innovation adoption. Firm's

market and competition is also has a significant impact on the effectiveness of firm's market sensing capability (Kohli and Jaworski, 1990). A Firm that operates in turbulence markets is forced to make additional adjustments and adaptations on the process of information absorption than do other firms operate in stable markets (Kim, N., and Jae, H. P., 2007). Finally, regulatory environment has been recognized as a critical environmental factor influences the diffusion of innovation. Some studies combined TOE framework with institutional intervention (Kilangi, 2012), as the government can influence ICT adoption and diffusion by setting regulations to facilitate the adoption of particular innovation.Muafi et al. (2012) states that government policies positively influence IT usage among SMEs in Yogyakarta, Indonesia.Moreover, a longitudinal survey on a small-scale tile industry that was conducted by Sandee and Rietveld (2010) indicates that access to technology and collaboration among leaders are crucial to technology adoption.

Furthermore, Kilangi (2012) notes significant relationships toward Internet innovation adoption among SMEs. However, there are variations in the findings of relationship between competitive pressures to the ICT adoption as (Pan MJ, Jang WY. 2008) conclude that competitive pressures does not have any significant direct influence on the adoption of ICT. Also, Chong et al. (2009), Spanos and Voudouris (2009) indicate the importance of competitive pressure factors that contributes to technology adoption among SMEs. Nevertheless, in the context of fashion industry, the competitive pressure can be considered as high considering numbers of players in the industry and low barrier to entry where every person or firm can enter the market easily, thus:

**H8**: Competitive pressure positively influences ICT adoption.

According to Kohli and Jaworski (1990) an environment is considered turbulence when the external environment where a firm operates change rapidly. Furthermore, market turbulence can be classified into market turbulence and technological turbulence. Market turbulence is defined as the rate of change in customer composition and preferences, and technological turbulence is described as the rate of technological change faced by a firm. Trainor et al. (2010) reveals a conclusive findings in their study, states that market turbulence has a significant negative relationship with customer performance outcomes, in a sense that in highly changing markets, customer expectation and demand change rapidly. In line with this finding that since customer expectation can change very rapidly, there is an urge for a firm to develop strategic plan and ICT adoption is considered as one of solution to deal with market turbulence, therefore:

**H9**: Market turbulence is positively influences to ICT adoption.

According to institutional theory, institutional environments are essential in determining firm structure and actions in this case government can encourage the adoption of innovation by developing regulations (i.e. tax laws) that can benefit organization (Xu, S., Zhu, K., and Gibbs, J., 2004). In addition, a study conducted by Riyadh et al. (2009) suggest institutions such as government, donor agencies, financial institutions play a significant role in technology diffusion. Also, ICT adoption among ICT greatly depends on government initiatives (Kong and Eze, 2008). As stated earlier, ICT adoption among SMEs hinder by limited resources, hence, government support through financial aids, regulations, infrastructure, and ICT knowledge building can facilitate ICT adoption among SMEs. Thus:

**H10**: Institutional intervention positively influences ICT adoption.

Based upon the literature review discussed above, the framework of this study can be seen in figure 1.

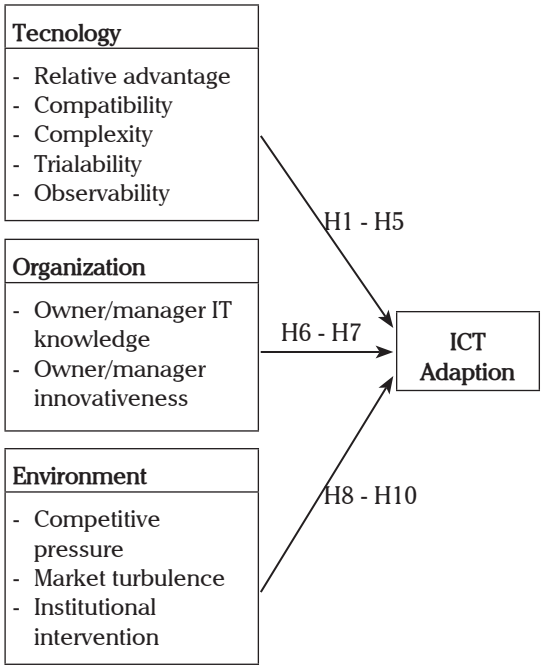


Figure 1. Research Model

## METHODS

### Research Procedure

This study employs descriptive quantitative data analysis, to investigate factors that contributed to ICT adoption in the context of SMEs in fashion subsector in Indonesia. Hypotheses are developed from theoretical reviews and empirical studies; subsequently it follows a confirmatory strategy of research in which a process of confirming or disconfirming hypotheses is employed to answer previously identified research questions.

*Sampling Procedure*

This current study, a non-probability sampling was employed, and the sampling method used was convenience sampling. The sampling frame consisted of 204 owners/managers of SMEs operating in fashion industry-related activities with a focus on the production, commercialization and distribution of ready-to-wear fashion products, and who had clothing kiosks in Thamrin City, one of the largest fashion centers in Jakarta, Indonesia. A survey method was employed to collect data. The survey method used a standardized questionnaire to collect desired information from respondents. In anticipation of a low response rate, the personal survey interviews were conducted and prior to conduct a full-scaled survey, a pilot-test to 30 respondents was executed to solicit feedback in terms of understanding of the survey wording and evaluate the measurement reliability and validity.

*Measurement*

All data was generated from questioners and was designed, based and modified on previous studies. The measurement scales used to collect the data were also derived from technological variables that consisted of relative advantage (4 items), compatibility (4 items), complexity (5 items), trialability (3 items), and observability (3 items). The organizational variables consist of owner/manager IT knowledge (3 items), owner/manager innovativeness (4 items). The environmental variables consist of competitive pressure (5 items), market turbulence (4 items), and institutional intervention (5 items). All the items were adopted from Tornantzky and Fleischer (1990) and Rogers, 2003). Moreover, ICT adoption was measured by using 6 items adopted from Bassellier, Benbasat, Reich (2003); Teo and Benbasat (2003); Rogers (2003); and Kilangi (2012). All questions were measured with a five-point Likert scale, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree. Finally, to obtain respondent profiles, the questionnaires also included several questions such as age, gender, and education, as well as questions on firm profiles such as firm age, number of employees, and number of stores.

Using the survey data, descriptive statistics analysis procedure was employed by using SPSS 22. A pre-test Cornbach's alpha was used to validate the consistency of measurement in the questionnaire, whereas Person Product-Moment Correlation Coefficient was used to measure the strength of a linear association between variables used in this study. In addition, multiple regressions were employed to test the relationship between the independent variables and the dependent variable.

**Research Findings**

Using the survey data from the pilot test, the statistics procedures in SPSS 22 were utilized for validating the outcome of the questionnaire. Cronbach's alpha was used to validate the consistency of measurements in the questionnaire. Based on the reliability test all variables are reliable with Cronbach's alpha value greater than 0.6 ($\alpha > 0.6$). It indicates satisfactory internal-consistency reliability among all of the variables used in this study. Furthermore, a validity test on the pilot-test sample was employed by using a Pearson Product-Moment Correlation Coefficient to measure the strength of a linear association between the variables. The result shows that all the measurements are valid with r>3 and t-value of 0.000. The results of both the reliability and validity tests on the pilot-test sample indicate that the variables and indicators can be used for full-scale data collection.

To gain a better insight of respondent and firm profiles, distribution frequency was used and the results are shown in table 1.

Furthermore, the results show that the value of F is 30.545 and p-value is 0.000, since the p-value=0.000< 0.10 it reveals that there is a significant effect on the independent variables toward the dependent variable. Furthermore, the adjusted R2 value of 0.7824 indicates that the model explains 78.24% of variability of the respond data.

Moreover, the results from multiple regressions analysis indicate that all technological factors namely compatibility, trialability, and observability are significantly positively influence the adoption of ICT among SMEs, whereas relative advantage and complexity are significantly influence ICT adoption but they have a negative relationship. Moreover, this study reveals that organizational factors such as owner/manager IT knowledge and innovativeness positively influence ICT adoption significantly. Finally, environmental factors such as competitive pressure and institutional intervention have a significant influence toward ICT adoption. However, this study shows that market turbulence does not influence on the adoption.

Table 1. Respondent and Firm Profiles

| Owner/Manager Profile | | | | Firm Profile | | | |
|---|---|---|---|---|---|---|---|
| | | Count | Percentage | | | Count | Percentage |
| Age | 20-25 | 43 | 21.0% | Year of Start-up | < 1 | 13 | 6.4% |
| | 26-30 | 46 | 22.5% | | 1-3 | 86 | 42.3% |
| | 31-35 | 31 | 15.2% | | 4-6 | 85 | 41.7% |
| | 36-40 | 21 | 10.3% | | 7-9 | 13 | 6.4% |
| | 41-45 | 25 | 12.3% | | 10-12 | 6 | 2.9% |
| | 46-50 | 21 | 10.3% | | >12 | 1 | 0.5% |
| | 51-55 | 9 | 4.4% | Number of employees | None | 26 | 12.7% |
| | 56-60 | 8 | 3.9% | | 1-10 | 162 | 79.4% |
| Gender | Male | 94 | 46% | | 11-25 | 12 | 5.9% |
| | Female | 110 | 54% | | 26-50 | 3 | 1.8% |
| Education | Elementary | 3 | 1.8% | | 51-99 | 1 | 0.5% |
| | Middle School | 32 | 16.3% | Annual Revenue (in millions IDR) | ≤60 | 0 | 0% |
| | High School | 101 | 49.5% | | 60-1,200 | 2 | 0.5% |
| | Diploma | 21 | 10.3% | | 1,201-6,000 | 176 | 86.3% |
| | Bachelor | 43 | 21.1% | | 6,001-12,000 | 23 | 11.3% |
| | Master | 3 | 1.5% | | 12,001-50,000 | 4 | 1.9% |
| | Doctoral | 1 | 0.5% | | | | |

## MANAGERIAL IMPLICATIONS

This study reveals that compatibilityis considered important for SME owner/manager, the more they feel that ICT fits well with their business, culture and values, existing distribution channels, and their customers, the more possibility they will adopt ICT. Moreover, it seems that owners/ managers will adopt ICT, if they perceive ICT is easy to learn, easy to understand, easy to use for their employees, customers, and business partner. This explains why the level of ICT adoption is still in the lower level since to move up to next level which is e-commerce, e-business, and finally transformed organization is considered to complicated process considering the level of IT knowledge they posses. Furthermore, the findings also highlight the importance of trialability to influence ICT adoption, the opportunity of owners/ managers to easily try various Internet applications such as email and other web-based applications (such as social media platforms: Facebook, Twitter, blogs, and websites) is an important driver to ICT adoption for SMEs since most of the owners/ managers are quite familiar and use those web-

Table 2. Hypothesis Testing

| Hypothesis | Unstandardized Coefficients | | t | Sig. | Remark | Decision Sig. level $\alpha$=10% |
|---|---|---|---|---|---|---|
| | B | Std. Error | | | | |
| H1: Relative Advantage influences ICT Adoption | -0.504 | 0.174 | -2.902 | 0.004 | Significant | Accept H1 |
| H2: Compatibility influences ICT Adoption | 0.285 | 0.130 | 2.184 | 0.030 | Significant | Accept H2 |
| H3: Complexity influences ICT Adoption | 0.288 | 0.092 | 3.138 | 0.002 | Significant | Accept H3 |
| H4: Trialability influences ICT Adoption | 0.368 | 0.140 | 2.621 | 0.009 | Significant | Accept H4 |
| H5: Observability influences ICT Adoption | 0.261 | 0.145 | 1.804 | 0.073 | Significant | Accept H5 |
| H6: Owner/manager IT Knowledge influences ICT Adoption | 0.382 | 0.171 | 2.235 | 0.027 | Significant | Accept H6 |
| H7: Owner/Manager Innovativeness influences ICT Adoption | 0.323 | 0.124 | 2.604 | 0.010 | Significant | Accept H7 |
| H8: Competitive Pressure influences ICT Adoption | 0.285 | 0.107 | 2.665 | 0.008 | Significant | Accept H8 |
| H9: Market Turbulence influences ICT Adoption | -0.211 | 0.160 | -1.319 | 0.189 | Not Significant | Reject H9 |
| H10:Institutional Intervention influences ICT Adoption | 0.112 | 0.062 | 1.805 | 0.073 | Significant | Accept H10 |
| F statistics | | | | 30,4543 | | |
| Sig | | | | 0,0000 | | |
| R Square | | | | 0,7824 | | |
| Adjusted R Square | | | | 0,6121 | | |

Note: **) at 5% significant level
*) at 10% significant level

based applications on a regular basis. This study also reveals that observabilityis one of determinant to adopt ICT. ICT benefits have to be believable and apparent for SME owners. Mentorship program can be one solution to support SMEs where successful adaptors can act as role models for other SME owners and allow them to transfer experience and expertise to other fellow SME owners.

Furthermore, this study reveals owners/ managers IT knowledge and innovativeness are organizational factors that contribute to the adoption of ICT.Owner/manager IT knowledge is found to be the greatest contributor among all factors that influence SMEs to adopt ICT. Again, access to any formal/informal training seems to be crucial to improve SMEs knowledge, skill, and competency. One of the strategies is to offer proper ICT training with competency building training for SME owners and employees. Involvement in any networks, cooperation (third party such as companies and academic institutions), and cluster activities also enables SMEs to engage in informal training and development.

Finally, this research indicates that competitive pressure, and institutional intervention are environmental factors that significantly contribute to the adoption of ICT among SMEs in fashion industry. Due to the size of their businesses, SMEs are highly affected by changes in the competition. Consequently, adopting ICT can reduce their vulnerability to remain competitive in the business. By adopting ICT business owners have more opportunities to reach less saturated markets located in different geographical areas. In addition, institutional intervention has a significant positive influence to the adoption of ICT, this study also draw attention to the role of government supports to foster adoption of ICT among SMEs such as improving access to more reliable and affordable internet connections, enhance SMEs' IT literacy, and finally formulate and implement legal, policy and regulatory framework.

### Research Limitations and Direction for Further Research

This current study uses a non-probability sampling;this method may limit the generalization of the research findings. Also, the scope of this study was only limited in Jakarta Greater Area, also the SMEs owners come from outside the location, further study can broaden the geographical area of the sample go give better insights of the results. The researcher suggests that future study may include deeper analysis of respondent and firm characteristics to link ICT adoption and such characteristics. Furthermore, this study limit to fashion subsector, the TOE framework could be replicated in different subsectors to examine the impact of ICT adoption across different sectors.

## CONCLUSION

This research aims at providing a clear understanding of the factors contributing to ICT adoption among SMEs in fashion industry in Indonesia. To identify the ICT adoption determinants, this study uses the Technology, Organization, and Environment (TOE) framework developed by Tornatzky and Fleischer (1990), based on this framework, technological factors are examined using five factors namely relative advantage, compatibility, complexity, trialability, and observability. Furthermore, organizational factors use two variables namely owner/manager IT knowledge and innovativeness. Meanwhile, environmental factors are assessed by using three variables namely competitive pressure, market turbulence, and institutional intervention.

In terms of technological factors, this research shows that five technological factors namely compatibility, trialability, and observabilityhave significant and positive influence on ICT adoption, meanwhile relative advantage and complexity have significant but negative influence on the adoption. Moreover, organizational factors such as owner/manager IT knowledge and innovativeness are organizational factors that have significant and positive influence toward ICT adoption. Finally,

two environmental factors competitive pressure, and institutional intervention are found to have significant influence on ICT adoption. However, the study reveals that market turbulence insignificantly influences ICT adoption. ■

## REFERENCES


Ajzen, I., and Fishbein, M. (1980). Understanding attitudes and predicting social behavior, Englewood Cliffs, NJ: Prentice-Hall, Inc.

Ajzen, I. (1985). From intentions to actions: a theory of planned behavior, Berlin, Springer.

Ala, S.S., Noor, M.K.M. (2009). ICT adoption in small and medium enterprises: an empirical evidence of service sectors in Malaysia. *International Journal of Business Management*, 4(2): 112.

Ashrafi R., Murtaza, M. (2008).Use and impact of ICT on SMEs in Oman. *The Electronic Journal Information Systems Evaluation,*11(3), pp.25-138.

Chao, C.A., Chandra, A. (2012). Impact of owner's knowledge of information technology (IT) on strategic alignment and IT adoption in US small firms.*Journal of Small Business and Enterprise Development*, 19(1): 114-131.

Chong, A., Ooi, K.B., Lin, B., Tang, S.Y. (2009). Influence of interorganizational relationships on SMEs' e-business adoption. *Internet Research,* 19(3): 313-331.

Ghobakhloo M., Aranda, D.A., Amando, J.B. (2011).Adoption of e-commerce applications in SMEs. *Industrial Management & Data Systems*, 3(8), pp.1238-1269.

Hage, J. (1980). Theories of Organizations: forms, process and transformation. New York. John Wiley &Sons.

Hadjimanolis, A. (1999). Barriers to innovation for SMEs in a small less developed country (Cyprus).*Technovation,* 9 (9), pp. 561-570.

Haug, A., Pedersen, S.G., Arlbjorn, J.S. (2011). IT readiness in small and medium-sized enterprises. *Industrial Management dan Data Systems,* 111(4): 490-509.

Indonesia Central Bureau of Statistics(2010). Statistik Industri kecil: Small-Scale manufacturing Industry Statistics, Jakarta.

Indonesia's Central Bureau of Statistics (2015).

Khatibi, A., Thyagarajan, V., and Seetharaman, A. (2003), E-commerce in Malaysia; perceived benefits and barriers.*Vikalpa,* 28 (3): 77-82.

Khong, S.T., Eze, U. C. (2008). An empirical study of internet-based ICT adoption among Malaysian SMEs.*Communications of the IBIMA*, vol. 1.

Kilangi, A.M. (2012). The determinants of ICT adoption and usage among SMEs: The case of the *tourism* sector in Tanzania (Dissertation). Netherlands. VrijeUniversiteit.

Kim, N., & Jae, H. P. (2007). Utilization of new technologies: Organizational adaptation to business environments. *Journal of the Academy of Marketing Science, Vol.* 35(2): 259-269.

Kohli, A.K., and Jaworski, B.J. (1990). Market orientation: the construct, research propositions, and managerial implications. *Journal of Marketing*, 54(2): 1-18.

Li Y. H. (2008). An empirical investigation on the determinants of e-procurement adoption in Chinese manufacturing enterprises.*International conference on Management Science & Engineering (15th).* California, USA, Vol I and II. Conference Proceeding: 32-37.

MARS. (2012). Studi Aplikasi IT dan Potensi Cloud Computing pada UKM.

Muafi, Gusaptono RH, Effendi MI, Charibaldi N. (2012). The information technology (IT) adoption process and E-reasiness to use within Yogyakarta Indonesian small medium entreprises (SME). *International Journal of Information and Communication Technology Research.* 2(1):29-37.

Oliveira, T., Martins, M.F. (2011). Literature review of information technology adoption models at firm level. *The Electronic Journal Information Systems Evaluation,* 14(1): 110-121.

Pan MJ, Jang WY. (2008). Determinants of the adoption of enterprise resource planning within the technology-organization-environment framework: Taiwan's communications industry. *Journal of Computer Information Systems,* 48(3): 94-102.

Premkumar, G., and Roberts, M. (1999). Adoption of new information technologies in rural small businesses. Omega: The International Journal of Management Systems in the northwest of England: an environmental, technology and organization perspectives. IFIP – Organizational Dynamics of technology-Based Innovation: Diversifying the Research

Agenda. McMaster, T., Wastell, D., Ferneley, E., and DeGross,J.I. Springer: Boson, pp. 409-430.

Rahayu R. (2015). Determinant factors of e-commerce adoption by SMEs in developing country: evidence from Indonesia. World Conference on Technology, Innovation and Entrepreneursip, 195: 142-150.

Ramdani B., Kawalek P., Larenzo O. (2013). Predicting SMEs adoption of enterprise systems. *Journal of Enterprise Information Management*, 20 (4); 735-753.

Riyardh A.N., Akter M.S., Islam, N. (2009). The adoption of e-banking in developing countries: the theoretical model for SMEs. *International Review of Business Research Papers,* 5(6): 212-230.

Sandee H, Rietveld P. (2010). Upgrading traditional technologies in small-scale industry clusters: collaboration and innovation adoption in Indonesia. *The Journal of Development Studies,*37(4): 150-172.

Scupola, A. (2009). SMEs' e-commerce adoption: perspectives from Denmark and Australia. *Journal of Enterprise Information Management*: 22 (1/2): 152-166.

Shiau, W.L., Hsu, P.Y., Wang, J.Z (2009). Development of measures to assess the ERP adoption of small and medium enterprises.*Journal of Information Management*, 22 (1/2): 99-118.

Shohaib K, Kandari A, Abdurahim MA. (2009). Internet adoption by Saudi public relations professionals.*Journal of Communiation Management*, 13(1):21-36.

Soares-Aguiar, A., Palma-Dos-Reis, A. (2008). Why do firms adopt e-procurement systems? Using logic regression to empirically test a conceptual model. *IEEEE Transactions on Engineering Management,* 55(1): 120-133.

Spanos, Y.E., Voudouris, I. (2009) Antecedents and trajectitories of AMT adoption; the case of Greek manufacturing SMEs. *Research Policy,* 38(9): 144-155.

Suharti L, Soegiono L, Purwati Y.(2014). Technology innovation adoption model among SME tempe producer (A study on tempe producer in Jawa Tengah, Indonesia). *International Journal of Business and Management Invention* 3(2):05-14.

Tan, K.S., Chong, C.S., Lin, B., Eze, U.C. (2009). Internet-based ICT adoption: Demographic versus benefits, barriers, and adoption intention. *Journal of Enterprise Information Management,* 23(1): 27-55.

Tan, K.S., Chong, S.C., Lin, B. &Eze, U.C. (2010). Internet-based ICT adoption among SMEs: demographic versus benefits, barriers and adoption intention, *Journal of Enterprise Information Management*, 23 (1): 27-55.

Teo, H.H., Wei, K.K., and Benbasat, I. (2003). Predicting intention to adopt interorganizational linkages: an institutional perspectives. *MIS quarterly,* 27(1): pp. 9-49.

The Ministry of Tourism and Creative Economy of the Republic of Indonesia. (2014). Ekonomi Kreatif: Kekuatan baru Indonesia menuju 2025. Rencana aksi jangka menengah 2014-2019.

Tornatzky, L.G., and Fleischer M. (1990).The process of technological Innovation. Lexington MA: Lexington Books.

Trainor, K.J., Beitelspacher, L., S., and Schillewaert, N. (2010). Integrating technology and marketing: an examination of the drivers and outcomes of e-marketing capability. *Industrial Marketing Management*, doi:10.1016/j.indmarman.2010.05.001.

Wanyoike D.M., Muluku E., Waititu A.G. (2014). ICT attributes as determinants of E-commerce adoption by formal small enterprises in Urban Kenya. International *Journal of Business and Social Science*, 3 (23): 65-74.

Xu, S., Zhu, K., and Gibbs, J. (2004). Global Technology, Local Adoption: A Cross-Country Investigation of Internet Adoption by Companies in the United States and China. *Electronic Markets*, 14(1): 13-24.

Zappala, S., and Gray C.W.J. (eds). (2006). Impact of e-commerce on consumer and small firms. London. Ashgate.