A MODEL OF INFORMATION TECHNOLOGY ADOPTION READINESS AMONG SMEs IN JAVA ISLAND

ASRUL SANI

ASIA e UNIVERSITY

2023

A MODEL OF INFORMATION TECHNOLOGY ADOPTION READINESS AMONG SMEs IN JAVA ISLAND

ASRUL SANI

A Thesis Submitted to Asia e University in
Fulfilment of the Requirements for the
Doctor of Philosophy

January 2023

ABSTRACT

The development of information technology in Indonesia has advanced in tandem with its increased usage in the industrial and SMEs sectors. Implementation of IT has become a necessity in order to enhance the quality of these sectors. Institutionally, this is essential to ensure affordable access and quality when it comes to managing performance. However, in reality, the use of IT among the SMEs is still considered low and this is said due to the readiness of users in IT utilization. To examine these phenomena, this study was conducted to determine the level of readiness of users in the SMEs sector towards the utilization of information technology by adopting a pre-existing model. The objective of the research was to evaluate and assess the factors that impact the level of readiness in IT utilization among SMEs on Java Island. The research model was built by adopting, combining, and adapting the technology readiness and adoption models with regards to selected theories. Methodologically, a quantitative approach was implemented throughout the research. The research took a survey of SMEs in Indonesia that were scattered across various points of the Java Island. Samples were taken from SMEs that had implemented IT in their companies, decided by the purposive sampling method and reaching 407 respondents. Valid surveys of the results response were then analyzed using Partial Least Squares (PLS-SEM). The findings of the research prove that the use of IT in SMEs must be accompanied by a degree of technology readiness as it has an influence on the effects of its utilization. This research also produces a new model, namely the modified adoption model of information technology utilization for SMEs on Java Island.

Keyword: Readiness, IT Adoption, SMEs, SmartPLS, TOE Framework

APPROVAL

This is to certify that this thesis conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, for the fulfilment of the requirements for the degree of Doctor of Philosophy

The student has been supervised by: **Prof. Dr. Titik Khawa Abdul Rahman** and co-supervised by: **Dr. A'ang Subiyakto, M.Kom**

The thesis has been examined and endorsed by:

Professor Ts. Dr. Haryani Haron
UiTM
Examiner 1

Professor Ts. Dr. Shukor Abd Razak
UTM
Examiner 2

This thesis was submitted to Asia e University and is accepted as fulfilment of the requirements for the degree of Doctor of Philosophy.

Professor Dr Siow Heng Loke
Asia e University
Chairman, Examination Committee
(17 April 2023)

DECLARATION

I hereby declare that the thesis submitted in fulfilment of the PhD degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which may result in my expulsion from the programme and/or exclusion from the award of the degree.

Name: Asrul Sani

Signature of Candidate: **Date**: 7 January 2023

ACKNOWLEDGEMENTS

Time flies, and Alhamdulillah, I have been able to complete my long, complicated, and challenging but fun Ph.D. over the past four years. During all the activities in this Ph.D., it would not have been possible without Allah SWT's support and many friends' help. First, I thank Allah Subhanahu Wa Ta'ala, which has given me the strength, patience, and guidance to achieve other important achievements in my life. He gave me a way that nothing could be reached with hard work and prayer. Also, I also thank my extended family, especially my parents, wife (Irawati), childrens (Taufik, Anjani, Faiz), and all my younger siblings, because thanks to all the support of love and motivation, alhamdulillah can be achieved this process of accomplishment. I could not complete this Ph.D program without all of you. And most importantly, my deepest and most sincere thanks to my Supervisor, Prof. Dr. Ts. Titik Khawa Abdul Rahman has spent countless hours assisting me in improving and refining this research I consider myself fortunate to be working under her supervision. Thanks to my Co-Supervisor, Dr. A'ang Subiyakto M.Kom, who introduced me to modeling research and information systems, so I fell in love and wanted to continue developing this research in the future. I could not have gone through this process without the time, understanding, encouragement, unconditional support, and personal guidance of the two supervisors. I am also very grateful to Dr. Usman Mulyadi for "inviting me" to study at Asia e University Malaysia, and thanks also to Dr. David Hasibuan, for giving me permission to continue my doctoral education. I am very fortunate to have done my Ph.D program very well with my bright friends, Gunawan, Dedek, Anton, Doddy AB, Ninuk, Suaib Halim, and Dwi Yuniarto, and I am honored to be able to connect to complete this Ph.D. jointly, I sincerely thank you for your valuable support, encouragement, and input. Finally, I thank Prof. Dr. Siow Heng Loke and Ms. Swa

Lee Lee, who continually provide us with updated information about lectures and courses. Hopefully, all the acts of worship that have been given to me can be rewarded by Allah SWT.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AFTA	Asian Free Trade Area
AMI	Analysis Mason Company
AVE	Average Variance Extracted
BPS	Bureau of Statistics
CA	Cronbach's Alpha
CEO	Chief Executive Officer
CR	Composite Reliability
CRD	Consumer Readiness
CPR	Competitive Pressure
DSC	Discomfort
ERP	Enterprise Resource Planning
FSC	Firm Scope
FSZ	Firm Size
ICT	Information Communication and Technology
IDR	Indonesian Rupiah
INV	Innovativeness
IS	Information System
ISC	Insecurity
ITA	IT Adoption
IT	Information Technology
MLE	Maximum Likelihood Estimation
OPT	Optimism
PLS	Partial Least Square
RPJP	Long Term Development Plan
SEM	Structural Equation Model
TEC	Technology Competence
TOE	Technology Organization Environment
TRI	Technology Readiness Index
TPL	Trading Partner Lack of readiness
SEM	Structural Equation Modeling
SMEs	Small and Medium Enterprises
WWW	World Wide Web

CHAPTER 1

INTRODUCTION

At present, management of a company cannot be denied any more by using and utilizing information technology (IT), including small and medium enterprises (SMEs) (Consoli, 2012; Rahayu & Day, 2017; Tarutė & Gatautis, 2014). Aside from the increasingly competitive level of business competition, the need for efficiency and effectiveness in company management necessitates that each company be prepared for and adopt these technologies. In this case, the company's development, SMEs, must be encouraged to follow and adopt technological developments. Companies that do not follow and do not utilize the application of information technology will be abandoned by customers. This was stated by the President of the US National Producers Association, in a wall street journal that small and medium enterprises need to use and play a role in the application of information technology or the company being run will be lost and abandoned by loyal customers (Shah Alam, Ali, & Mohd. Jani, 2011).

The role of SMEs in Indonesia is very strategic in making a significant contribution to national economic growth because SMEs are the largest business operators with a percentage above 99% of the total national business operators and employment absorption reaches 97 percent. SMEs are also a national economic buffer where SMEs are proven to be able to survive when Indonesia is experiencing a prolonged crisis or global economic recession. What makes SMEs survive is the characteristics of SMEs themselves. SMEs, which are mostly local community actors, also use local resources in their businesses so that they are not dependent on raw materials or imported resources. Furthermore, SMEs have a product advantage based

on local resources in their respective regions and create opportunities for export because of the uniqueness or characteristics of the products produced. Therefore, it can be said that the role of SMEs as the spearhead of national economic progress is very important and cannot be underestimated. The number of SMEs in Indonesia according to the Central Bureau of Statistics (Biro Pusat Statistik, 2018a) has reached 98.5 million, most of them are micro-entrepreneurs. SMEs increased by 2.02% compared to the previous year and have been proven to employ 107 million (97%) of the workforce in 2018 where the SME sector contributes substantially to 60.34% of Gross Domestic Product (liputan6.com, 2018).

Along with increasing universal competitiveness in markets and economic zones, now SMEs must develop themselves to have strong competition. The SME business development has been well developed and highly respected by the Government of the Republic of Indonesia as stated in the 2005-2025 Long Term Development Plan (Rencana Pembangunan Jangka Panjang), as a contribution to economic development and a greater spirit of competition. To achieve this, it is very important to strengthen and develop SMEs, and one of its development strategies is through the application and development of innovation and use of technology. At the level of application of technology, especially information technology applications are very low, which is around 30 to 40% (Erlanitasari, Rahmanto, & Wijaya, 2020; Tempo.co, 2014) and only 9% of SMEs had adopted e-business as of 2019, according to the Indonesian Ministry of Communications and Informatics (Deviyana, 2019). The lack of competitiveness of SMEs in creating markets is a benchmark for information technology utilization in operational or sales activities of the SMEs. According to Hasanah and Sibyan (2021) the IT literacy among the SMEs is still considered low and cause their business to be less competitive. IT utilization is important because

through it SMEs will be to create a broader market in order to expand their business (Hamid & Ikbal, 2018).

Although its role is very strategic in economic development in Indonesia, but the SMEs sector can be said to be unfavorable and encouraging. An open free market era such as the Asian Free Trade Area (AFTA) will threaten the existence of SMEs if their products cannot compete with foreign products, one of the other causes. To overcome the above, SMEs need innovation for a whole set of activities or business processes to provide added value or excellence in the products/services offered. One way to innovate is to use technology, especially Information Communication and Technology (ICT) (Ntwoku, Negash, & Meso, 2017; Tarutė & Gatautis, 2014). In other words, IT adoption can facilitate SMEs in the innovation process. The rapid adoption of IT adoption provides great potential and opportunities that can help solve the problem of SMEs caused by various limitations (Napitupulu, Syafrullah, Rahim, Abdullah, & Setiawan, 2018).

1.1 Background of the Study

Implementation of IT can be intended as the use of technology-based systems to monitor information in all levels of organization and business. The positive influence of the use of information technology applications for SMEs is improving performance in the marketing, communication and network division, as well as in the resource planning division, so that it can improve financial management and all operational achievements if information technology can be utilized properly (Fathian, Akhavan, & Hoorali, 2008; Nair, Chellasamy, & Singh, 2019).

In general, it should be recognized that the use of information technology in the SMEs industry can improve efficiency and effectiveness, especially in the case of

SMEs in developed and developing countries (Dyerson & Spinelli, 2017). Research that has often been done is to use surveys as the main data collection instrument, which offers little insight into the heterogeneous nature of SMEs themselves in developing countries (Awajan, El-Omari, Hasan, & Awajan, 2009). As a result, our understanding of what drives sustainable adoption of IT among SMEs in developing countries is still very limited.

It is expected that the results of the research will provide a result in the form of a decision to use and implement IT in SMEs, in terms of technology, IT readiness and adoption. Another thing that resulted from the research was the novelty of the model produced, namely the combination of the technology readiness model (Parasuraman, 2000; Parasuraman & Colby, 2015) and the IT adoption model (E-Business) (Chatzoglou & Chatzoudes, 2016; Zhu et al., 2003).

Some of the factors that prevent it from stimulating investment in ICT are as follows:

a. Finance, where high initial investment and difficulties in access to credit are unable to invest in

b. Infrastructures : equipment and tools, bandwidth and unreliable Internet connections

c. The organization, lack of staff experts and strategies that are capable of resolving ICT issues

d. Technology, the absence of adequate training so that capabilities do not exist. To encourage ICT investment in SMEs, developing public policies that eliminate the digital divide, provide free high-bandwidth internet access, and support training is critical.

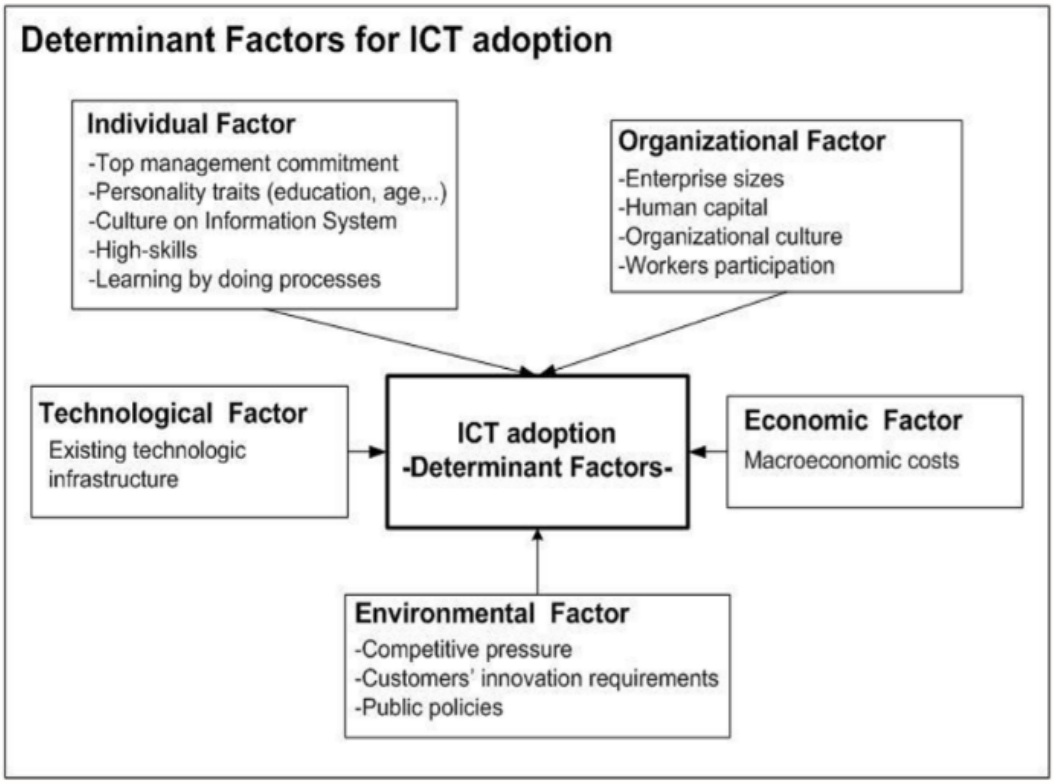
In some literature, there have been many contributions to the application of ICT in small and medium enterprises. It can classify the determinants in 5 groups: individuals, organizations, environment, technology, economics (Consoli, 2012; Skoko, Buerki, & Ceric, 2007).

In figure 1.1. individual factors, in this case, the country, are very important in developing IT adoption. Each country in the world has its own characteristics. There are countries that have the excellent technological infrastructure and a level of trust in-development e-business and the use of IT is very developed, but there are also countries that have technological infrastructure still in the development stage and are still hesitant in-development e-business and IT use (Damaskopoulos & Evgeniou, 2003; Yacob, Sulistiyo, Erida, & Siregar, 2021).

The use and application of IT can reduce business costs, increase productivity and strengthen growth possibilities. In addition, the adoption and implementation of IT by companies can enhance business cooperation, so that business relations can be improved more in quality and diffusion of knowledge (Barba-Sánchez, Martínez-Ruiz, & Jiménez-Zarco, 2007). Therefore, SMEs with a philosophy of innovation and development are strong strategic tools to move towards economic improvement (Barba-Sánchez et al., 2007; Fabiani, Schivardi, & Trento, 2005).

Bayo-Moriones and Lera-López (2007) in his research found that the hypothesis regarding the factors of corporate environmental influence has not been fully confirmed, but significant market competition was seen in companies that did not fully use IT in the company, so that the company could not meet the company's internal and external needs (Arslan, Bagchi, & Kirs, 2019).

Figure 1.1: Determinant factors for ICT adoption (Consoli, 2012)



The presence of large company companies in the international market has a positive effect on SMEs, especially in terms of the use of IT in this case the internet and other technology uses. The development of the use of IT is very influential on economic factors in this case sales, and the use of IT can be maximized again in terms of planning and operating the company (Bayo-Moriones & Lera-López, 2007; Blomquist & Wilson, 2007)).

The process of IT adoption is a very complex job and must be given a good touch so that it can lead to conditions such as:

a. Business conditions (sensitivity and commitment from top management),

b. The condition of the organization (employers, employees of IT departments or external consultants/vendors),

c. Management conditions (placement of appropriate ICT tools by skilled human resources).

Analysis of IT adoption factors and their impact on organizations is very important to understand how to stimulate SMEs in the process of investing in new technologies to gain competitive advantage and good business performance. In this sense, it is important to create a framework for measuring the readiness of companies in IT adoption. The use of IT must be explained in the business plan and in line with the strategies of the company and internal organizations to fully utilize the potential of technology. Two possibilities that will occur in this case are top management is not profitable to invest in technology or he is very enthusiastic about investing in ICT but the company's structure and strategic plan is inadequate. This framework is useful for outlining company characteristics and for implementing a more efficient and effective adoption process (León, Igartua, & Ganzarain, 2016). In the world, there are many best practices that show how SMEs, which have invested heavily in ICT, increase turnover and market share to become successful companies.

SMEs have many opportunities that should be better able to adopt new technology because SMEs are small, flexible companies and can quickly adjust changes in the business environment compared to large organizations (Harindranath, Dyerson, & Barnes, 2008). The development of communication and information technology, especially the internet and the World Wide Web (WWW) in business has changed and revolutionized the way of thinking and the way business processes will be carried out in a large organization and in small organizations, especially SMEs. Saving and decreasing costs associated with the process of running a business using information technology can make SMEs able to participate in global markets. And this has shown a lot that there is undeniable evidence that information technology can

contribute to the competitive advantage of SMEs because of their flexibility, adaptability and innovative nature (Gray, 2017). In today's business environment, most SMEs in developed and developing countries have no choice to be able to disseminate information about their companies on the internet so that their business processes can be known clearly and transparently if the company wants to remain in a position of competitive advantage in the business world.

A large number of similar studies forces researchers to innovate in research; moreover, there is much research based on IT adoption in Indonesia. IT-based research with application to SMEs emphasizes the success of implementing IT adoption (Nika et al., 2022; Yuniarty, Prabowo, & Noegraheni, 2019) but not in readiness, even though the readiness factor in implementing IT is fundamental.

The location of the SMEs demographics is also very influential and has a different role to be able to distinguish one company from another (Hadri, Muafi, Mustiko, & Sigit, 2020). SMEs located in developed countries are not only defined using and have different criteria, but also the environment and influence around the company's operations are also very different from SMEs in developing countries. Mentioned in some literature, most of the adoption studies and use of ICT issued in developed countries, SMEs located in developed countries have level of infrastructure a high-level and sophisticated ICT, have better and more structured levels of education and ICT skills, more funding, low-cost internet connectivity, with different cultural backgrounds so that the level of skill and ability to use it is also different.

The merging of the two models above is a model of adaptation of the technology model of readiness and the IT adoption model which is motivated by the importance of combining the two models especially for the development of SMEs in Java Island. The development and spread of ICT are still low in SMEs so that SMEs

are not fully able to exploit the potential of ICT as in large companies. This is largely due to the fact that SMEs lack or have no resources at all, the absence of supportive technology, and limited financial capacity despite uncomplicated organizational structures, smaller companies are more flexible towards changes (Awajan et al., 2009; Sadat Safavi, Amini, & Javadinia, 2014).

1.2 The Problem Statement

SMEs in Indonesia is one of the main factors in increasing economic development so far. This development is due to a large number of SMEs operating during the past decade. The development of large-scale companies in Indonesia is also very dominant, especially in the development of IT and devices.

Large-scale businesses that have made extensive use of modern technology in the development and operation of their operations. Another thing in the development of information technology in Indonesian SMEs is that access to capital is so low due to lack of capital support from banks or financial institutions that the development of ICT cannot be used to the fullest. Low competitiveness of SMEs is generally caused by limited capital, human resources and access to information for business network marketing (Nugroho, 2015). In addition, it is also due to a lack of government policy in supporting the small and medium business sector

For developed countries, ICT development is very rapidly developing both in terms of infrastructure development and system development such as internet connection services. On the other hand, for developing countries, some things still have problems with the development of ICT in their countries, lack of internet services and connections and low ICT skills and education, so that this can hinder the use of